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Household integration in Neolithic villages: A new model for the Linear Pottery Culture in west-central Europe

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ABSTRACT

This paper proposes a novel interpretation of Neolithic Linear Pottery (LBK) settlement organisation, based on comparative analysis of data on subsistence (faunal remains, macrolithic tools) and on pottery manufacturing techniques and apprenticeship networks in the settlement of Cuiry-lès-Chaudardes (Aisne, France). This new model explains differences in house size in terms of both varying degrees of economic maturity and particular functional status. We argue that each house is self-sufficient in terms of subsistence, but at the same time maintained reciprocal relations with a number of other houses. Our model also describes how the stages of establishment, assimilation and integration of family units evolved within the village community. We ultimately offer insights into the social rules, stable over time, underlying matrimonial networks and mobility patterns in the LBK.

1. Introduction

The Linear Pottery Culture (LBK) emerged in the Hungarian Plain at around 5550 cal BC (Bánffy and Oróss, 2010) and spread across temperate Europe until about 4950 cal BC, reaching Normandy in the west and Ukraine in the east (Lüning, 1988; Whittle, 1996; Dubouloz, 2003; Crombé and Van Strydonck, 2004; Bocquet-Appel et al., 2009). The LBK economy and settlement system can be traced through archaeological remains which are exceptional for prehistory in both quantity and quality: long-house villages, burials often grouped in cemeteries, as well as substantial evidence for subsistence, craft production and symbolic activities (Pavlů, 2000; Price and Douglas, 2000; Lenneis, 2008; Oróss and Bánffy, 2009; Ilett, 2010; Gronenborn and Petrasch, 2010). Traditionally, much LBK research has concentrated on the establishment of periodisations based on studies of pottery decoration. These have produced sequences with a high temporal resolution (about 50 years), which are amongst the most precise in the European Neolithic (Soudský, 1962; Meier-Arendt, 1966; Modderman, 1970; Constantin, 1985; Stehli, 1989; Pavuk, 2004; Marton, 2008; Meunier, 2012; Blouet et al., 2013).

Using this well-documented archaeological evidence, with its robust chronological framework, a number of bio-archaeological projects have recently offered new insights into the mechanisms and trajectories of LBK expansion across Europe. Mobility and diversity in populations have been studied using isotopic imprints (the strontium isotopes ratio: $^{87}Sr/^{86}Sr$) provided by tooth enamel from human skeletons from cemeteries (Price et al., 2001; Bentley et al., 2002, 2003, 2008, 2012; Bentley and Knipper, 2005a, 2005b; Nehlich et al., 2009; Price and Bentley, 2005; Price et al., 2003, 2006). These analyses reveal that, from the very beginnings of the LBK expansion, quite a large proportion of individuals grew up in a different region to where they died and can therefore be considered as non-locals. Isotopic evidence also highlights some distinctions between males and females with regard to geographic origin: about 10% of females were recognised as non-local individuals, whereas this was the case with only 2% of males (Bentley et al., 2012). In some parts of western Europe, this trend seems to have increased during the spread of the LBK, according to results obtained from cemeteries in south-western Germany (Price et al.,

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2001, 2006; Bentley, 2007; Bentley et al., 2002). Here, proportions of about 20% non-local females and 10% non-local males were recorded. All these results were interpreted as indicating that patrilocal rules governed LBK communities, with wives moving to the residences of their husbands. The hypothesis has been put forward that these non-local females originated from Mesolithic hunter–gatherer communities or came from neighbouring or more distant LBK settlements (Price et al., 2001, 2006; Bickel and Wittle, 2013).

Possible relationships between indigenous Mesolithic groups and LBK communities, together with their possible impact on the spread of the LBK, represent a long-standing issue that is still widely debated by archaeologists (see for example: Gronenborn, 1999; Jeunesse, 2002; Manen and Mazurié de Keroualin, 2003; Eichmann, 2004; Vanmontfort, 2008; Constantin et al., 2010; Allard, 2007; Bánffy et al., 2007; Raczky et al., 2010). The first DNA studies on LBK populations supported the hypothesis of a strong hunter–gatherer contribution to LBK expansion (Richards et al., 2000; Haak et al., 2005). However, the most recent analyses carried out by the same authors or by others now suggest a major contribution by populations originating from the Near East and Anatolia to the first LBK communities, thus indicating a rather minor hunter–gatherer contribution to the farming populations. The latter contribution may only have occurred towards the end of or a short time after the spread of the LBK (Chikhi et al., 1998; Chikhi, 2002; Haak et al., 2010; Bramanti et al., 2009; Gignoux et al., 2011; Fu et al., 2012; Rasteiro et al., 2012; Rasteiro and Chikhi, 2013). The latest DNA analyses on LBK populations from Hungary seem to confirm these results (Szécsényi-Nagy et al., 2014).

This bio-archaeological work has focused the debate on key aspects of LBK society: the mechanisms of its spread and the mobility of individuals. Based on data from burial sites, the analyses provide extremely valuable insights, although the evidence is partial because apparently not all LBK individuals were buried (Jeunesse, 1997; Thevenet, 2010).

We believe that the archaeological evidence from settlements can contribute to the debate and we present here a different approach that is complementary to the bio-archaeological work. Our approach is centred on the anthropological interpretation of data from refuse contexts in settlements. We consider that finds from the domestic space – here the refuse pits alongside houses – mirror the daily activities carried out by individuals, thus providing an effective means for identifying cultural, economic and social factors governing social interaction within LBK communities.

Our present study is a comparative analysis of three types of data of particular significance for dietary behaviour and production networks: faunal assemblages (Hachem, 2000, 2011), macrolithic tools (Hamon, 2006) and pottery production (Gomart, 2014). A novel approach in LBK research, this study has roots in the French school of social technology (Leroi-Gourhan, 1964; Latour and Lemonnier, 1994).

The settlement site of Cuiry-lès-Chaudardes (Picardy, France) is an ideal case study as it combines all the parameters that are favourable to this kind of comparative analysis: (i) well-preserved house plans, (ii) a relatively short duration of occupation, facilitating the attribution of refuse pits to individual houses, (iii) abundant finds, and (iv) significant results from a broad range of specialist studies carried out since the 1980s by a research team working in synergy (Ilett et al., 1986; Ilett, 1989, 2012; Constantin, 1985; Sidéra, 1989, 2012; Chartier, 1991; Bakels, 1995, 1999; Hachem, 1996, 2000, 2011; Coudart, 1998; Ilett and Hachem, 2001; Dubouloz, 2003; Allard, 2005; Hamon, 2006; Bonnardin, 2009; Hachem and Hamon, 2014; Gomart, 2014).

The previous studies carried out by Hachem (2000, 2011), based on the spatial distribution of animal bones, highlighted differences in consumption that were related to the size of the houses and their position within the settlement. This model was also supported by the analysis of the distribution of grinding equipment within the settlement (Hamon, 2006). The combination of these two studies revealed economic patterning, with the larger houses linked more to stock-keeping and cereal consumption, and the smaller houses more to hunting and its by-products (Hachem and Hamon, 2014). All this evidence can now be combined with the results of study of pottery production in the settlement (Gomart, 2014). This new research on pottery is based on the assumption that production traditions are strongly correlated with the social identity of the potters (Gallay, 1992; De Crits, 1994; Dietler and Herbich, 1998; Gosselain, 2002; Roux, 2010, 2011).

This present study sets out to propose a novel interpretation of Linear Pottery settlement organisation, incorporating economic aspects related to the dietary and symbolic value of the products of agriculture and stock-keeping, as well as the social dynamics reflected by apprenticeship filiations in pottery techniques. The study also integrates evidence for houseplan variation, as well as examining the location of the houses in the settlement and their position in the occupation sequence. We put forward some new hypotheses, relating firstly to the social function of the different houses and secondly to distinct rules for mobility within the LBK.

2. Materials and methods

2.1. The site of Cuiry-lès-Chaudardes

The site of Cuiry-lès-Chaudardes is particularly suitable for an anthropological interpretation that combines evidence from both the finds and the houseplans (Fig. 1):

- First, because of the large number of buildings and pits: 33 well-preserved houseplans and 126 pits were discovered. Considering that a small portion of the site was destroyed before fieldwork started and taking into account differential erosion on the site, the initial number of houses can be estimated at between 35 and 40. No particular grouping of houses can be recognised, and the site plan reflects rather a uniform organisation. The houseplans, invariably orientated east–west, vary in size: they are between 5 and 8 m wide and between 8 and 37 m long. A majority, however, have lengths less than or equal to 15 m. The internal space of most of the houses is firmly structured, notably around a "corridor" (two closely set three-post cross-rows) that separates the back part from the remainder of the building (see Section 2.2).
- Second, the duration of the settlement is quite short, covering the whole of the Aisne valley LBK sequence and resulting in a relatively low density of house plans. This sequence probably lasted no more than 150 years and corresponds to the final LBK in neighbouring regions of north-eastern France (Ilett and Meunier, 2013). An assessment of radiocarbon dates from Cuiry-lès-Chaudardes and other sites in the region suggests a probable time span of c. 5100–4950 cal BC for the final LBK (Dubouloz, 2003). The difficulty in using radiocarbon dates for establishing the finer internal chronology of settlements is a well-known issue in LBK research (see for example Jadin, 2003; Stäuble, 1995). In the case of Cuiry-lès-Chaudardes, the margin of error of calibrated dates is equivalent to or exceeds the total duration of the settlement. Furthermore, a Bayesian approach is not applicable here, in the absence of independent stratigraphic evidence such as intercutting house plans or pits. The internal settlement chronology of Cuiry-lès-Chaudardes is therefore based on the periodization of the ceramic assemblages associated with each house, the most relevant factor here being quantitative change in decoration techniques,