



Archaeointensity study of five Late Bronze Age fireplaces from Corent (Auvergne, France)



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ABSTRACT

Recent excavations at Corent (France) unearthed a vast Late Bronze Age settlement. The high density of fireplaces especially highlights it. The present study focuses on the archaeomagnetic study of five fireplaces. These ones were dated between 950 and 800 BCE by cross-dating of metallic and ceramic artefacts and by radiocarbon. The main objective of our study is to increase the archaeointensity database in Western Europe at the beginning of the first millennium BCE. The sampling was conducted on 64 fragments of baked clay and sherds from the fireplaces floor. The classical Thellier-Thellier protocol provides 48 successful archaeointensity results, yielding to five mean values between 58 and 69 μT at the site. Together with previously published results, our new data point out two successive maxima of the intensity of the geomagnetic field. The first maximum $\sim 70 \mu\text{T}$ in the ninth century BCE and the second $\sim 90 \mu\text{T}$ in ~ 700 BCE are separated by a $\sim 45\text{--}50 \mu\text{T}$ minimum at $\sim 800\text{--}750$ BCE. The resulting fast variation of the field intensity will be very useful for archaeomagnetic dating purposes. As the direction of the geomagnetic field has also a strong variation during this period (Hervé et al. 2013a), archaeomagnetism promises to be a powerful dating tool to recover the historical processes at the transition between the Bronze and Iron Ages in Western Europe.

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1. Introduction

The number of archaeomagnetic intensity results considerably grew in Western Europe during the last few years (e.g. Genevey et al., 2009, 2013; Gómez-Paccard et al., 2008, 2012; Hervé et al., 2013b; Schnepf et al., 2009; Tema et al., 2013). Most of them cover the past 2500 years and only few have been published for older periods (Aidona et al., 2006; Gallet et al., 2009; Hervé et al., 2011; Hill et al., 2008; Kapper et al., 2015; Kovacheva et al., 2009). The latter highlight a fast secular variation in intensity, especially between 1000 and 500 BCE that is at the Late Bronze Age and the Early Iron Age. This fast changing of intensity was also recovered in the Middle East (e.g. Ertepinar et al., 2012; Gallet and Le Goff, 2006; Gallet et al., 2015; Kovacheva et al., 2014; Shaar et al., 2011). A better constraint of the secular variation during this period in Western Europe will allow to better understand the geomagnetic field behaviour at the regional and global scale (Hong et al., 2013).

By the other hand, this fast secular variation lets also expect a great potential for the archaeomagnetic dating technique. A directional (inclination and declination) curve is already available for Western Europe

(Hervé et al., 2013a). However, Western Europe intensity data for Late Bronze and Early Iron Age are still too few to build a precise and accurate regional secular variation curve. Adding the intensity to the direction will provide a more efficient chronological tool for archaeologists. The five new data from the Late Bronze Age settlement of Corent presented in this study are a new step to better recover the intensity secular variation in Western Europe and to improve the dating method for this period.

2. Archaeological context

The Puy de Corent is located on a plateau overlooking the Grande Limagne plain, 19 km away from Clermont-Ferrand in Auvergne (Latitude: 45.665°N; Longitude: 3.189°E). Since 2001, two teams of researchers have excavated this site, one from Université Lumière Lyon II conducted by Matthieu Poux and another one from Université Toulouse – Jean Jaurès conducted by Pierre-Yves Milcent. This location is very famous for its *oppidum* of the Late La Tène period, but is also characterized by earlier important agglomerations (Milcent et al., 2014a, 2014b).

One of these important occupations of Puy de Corent's is dated at the end of the Bronze Age (from the end of the 11th to the end of 9th century BCE), during which a vast and dense settlement developed on the

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lower part of the plateau and covered a minimum surface of 15 ha (Fig. 1a). Its limits have not yet been reached and we have now some evidence that the site could be one of the first proto-urban settlements in Western Europe (Ledger et al., 2015). Three successive phases of occupation and development of the agglomeration were recognized: “Bronze Final 2 récent” (~1050 – ~950 BCE), “Bronze Final 3 ancien” (~950 – ~900 BCE) and “Bronze Final 3 récent” (~900 – ~800 BCE). These phases are determined by stratigraphy. They are dated by few radiocarbon dates and by comparison of the abundant ceramics and metallic artefacts with similar objects coming from accurately dated alpine lake’s palafittes. The various occupation levels display a high density of fireplaces, also dated by their relative positions in the stratigraphic sequence and according to their close relationships with the ceramic and metallic material. Radiocarbon dating (Lyon-11289, 2785 ± 35 BP)

of the occupancy level numbered [20450] related to the fireplace FY20462, assigned to “Bronze Final 3 ancien” by ceramics, confirms the archaeological dating ([950; 900] BCE) with the dating interval [1012; 839] BCE at 95% of confidence and [979; 899] BCE at 68% of confidence.

The 64 fireplaces of the Late Bronze Age (1 per 50 m² in average) discovered since 2001 display, whatever their phase, some recurrent features in their shape and their construction type. Most of the time, fireplaces are built on simple or mixed raft foundation of small pebbles, basalt blocks, re-used fragments of stone macro-equipment (grindstones and granite thumb-wheels) or ceramic sherds (Fig. 1b-c). They support screeds with thickness generally varying between 1 and 3 cm made of mixed clay and sand. The best-preserved fireplaces are either circular or rectangular with round angles, and measure between 1.00

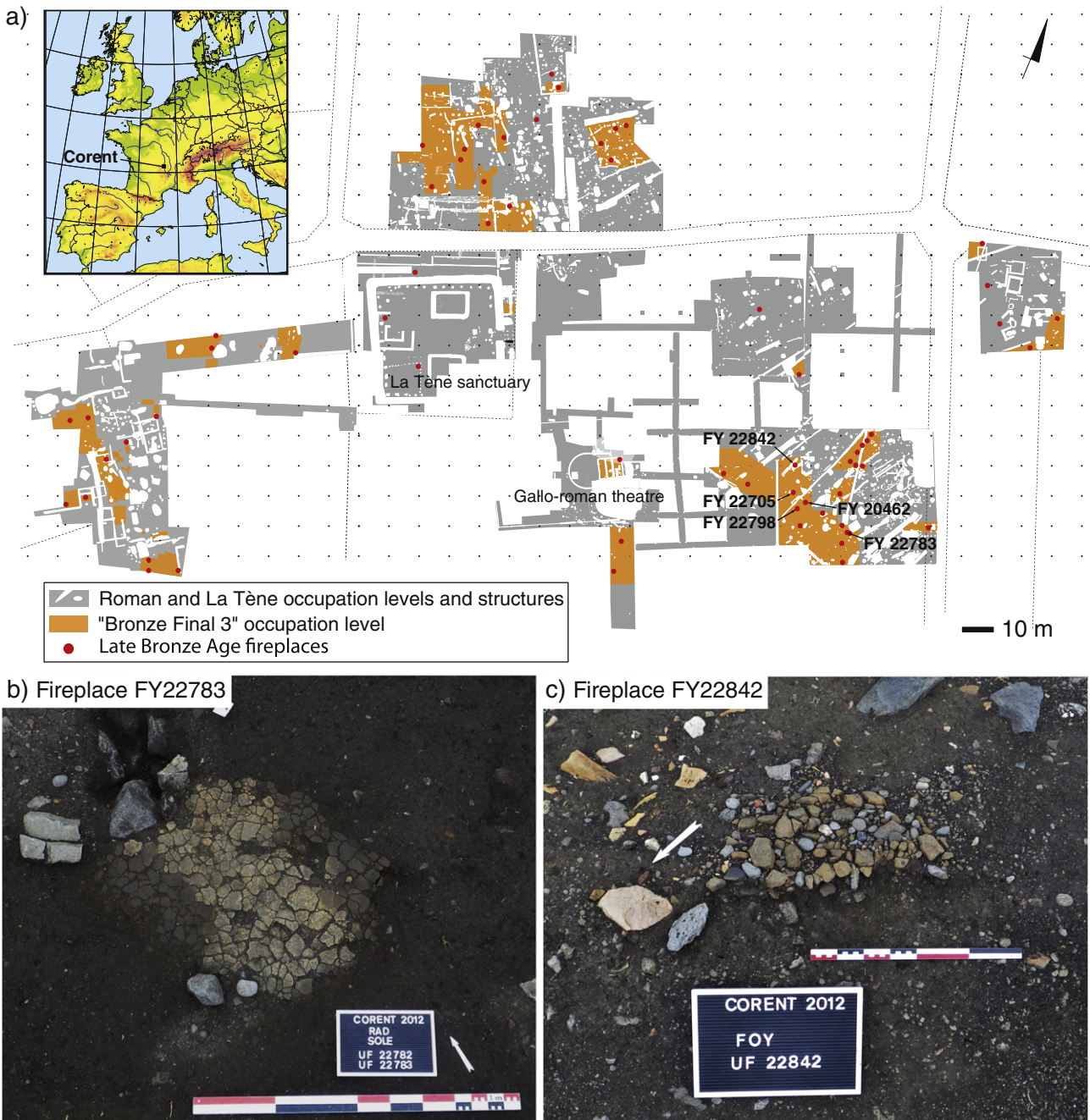


Fig. 1. Map of the central area of Coirent archaeological site (2001 to 2015 excavations) emphasizing the levels from the Late Bronze Age (“Bronze Final 3”) and their associated fireplaces (a) and pictures of two sampled fireplaces (b-c).

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