

## Chronique / Kroniek

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### **The CRUMBEL project takes a closer look at the human cremated bone collections from Belgium**

Cremated human remains are regularly encountered in archaeological contexts. However, they have been seldom studied with care due to the lack of apparent value and their high level of fragmentation. Indeed, during cremation, temperatures can reach up to 1000°C destroying all organic matter (skin, flesh, etc.) and leaving behind only the inorganic fraction (i.e. bioapatite) of bone and teeth. Contrarily to common beliefs, the cremated skeletal elements do not turn to “ashes” but, conversely, tend to become whiter, more friable, and change their properties (e.g. higher crystallinity).

Due to the difficulty to work with cremated human remains, these have often been put aside. However, thanks to recent analytical developments and improvements of osteological and geochemical techniques, it is now possible to extract much more information from these remains than one originally thought. It is indeed possible to obtain radiocarbon dates (LANTING *et al.*, 2001), as well as information about the mobility and geographical origin of cremated individuals (HARVIG *et al.*, 2014; SNOECK *et al.*, 2015) and the way in which their bodies were burned (SNOECK *et al.*, 2014, 2016). More and more efforts are also put into developing methods to estimate the sex and age-at-death of cremated individuals from their skeletal remains (CAVAZZUTI *et al.*, 2019), although much more work is still needed.

The study of cremated bone is of particular interest for times and places where it was one of the dominant burial rituals. In Belgium, for example, cremation was practiced from the late Neolithic to the Early Medieval Period, covering more than 3000 years of Belgian history. The lack of studies focusing on these remains means that many aspects of the lives of those living in Belgium during these periods remain unknown.

Crucially, in the sandy soils of Flanders, very few unburned human remains were found due to the acidity of the soils. Still, cremated bone survives such conditions due to its more crystalline structure and offers the opportunity to study directly the human remains of those living on those sandy soils.

The Excellence of Science (EoS) project CRUMBEL – CRemation Urns and Mobility: population dynamics in BELgium – joins researchers from the Vrije Universiteit Brussel (VUB), the Université Libre de Bruxelles (ULB), Ghent University and the Royal Institute for Cultural Heritage (KIK-IRPA). It aims to bring back to life these forgotten collections of cremated bone by applying novel methodologies and developing additional ones. The focus will be on osteoarchaeological and geochemical methods as well as experimental work (Fig. 1). Determining age-at-death and sex of cremated individuals remains challenging, especially when the fragmentation state is very high, and requires further investigation. Additionally, better understanding what happens during cremation itself is of crucial importance to assess changes in funerary practices through time and space. To this end, experimental cremations will be combined with isotopic and elemental analyses, as well as spectroscopic and x-ray techniques.

Established methods of radiocarbon dating and strontium isotope analyses of cremated bone will be widely applied on samples from several hundred sites (DALLE *et al.*, 2019; Fig. 2) to refine the Belgian chronology and assess population dynamics through time in Belgium. The latter also requires the establishment of a national baseline of the biologically available strontium based on modern plants, which will be of use, not only to this project but to any project looking into animal

and human mobility. Combined with the osteological data, the radiocarbon dates and strontium isotope ratios will allow to evaluate demographic and cultural changes and how these are linked to one another in Belgium from the Neolithic to the Early Middle ages.

The 4-year CRUMBEL project (2018-2021), spanning across three millennia and covering more than 30,000 km<sup>2</sup> will, without a doubt, lay the foundations for future research looking into archaeological population dynamics at a national and international scale.



**Fig. 1** – Experimental cremation pyre reconstruction to better understand funerary practices.



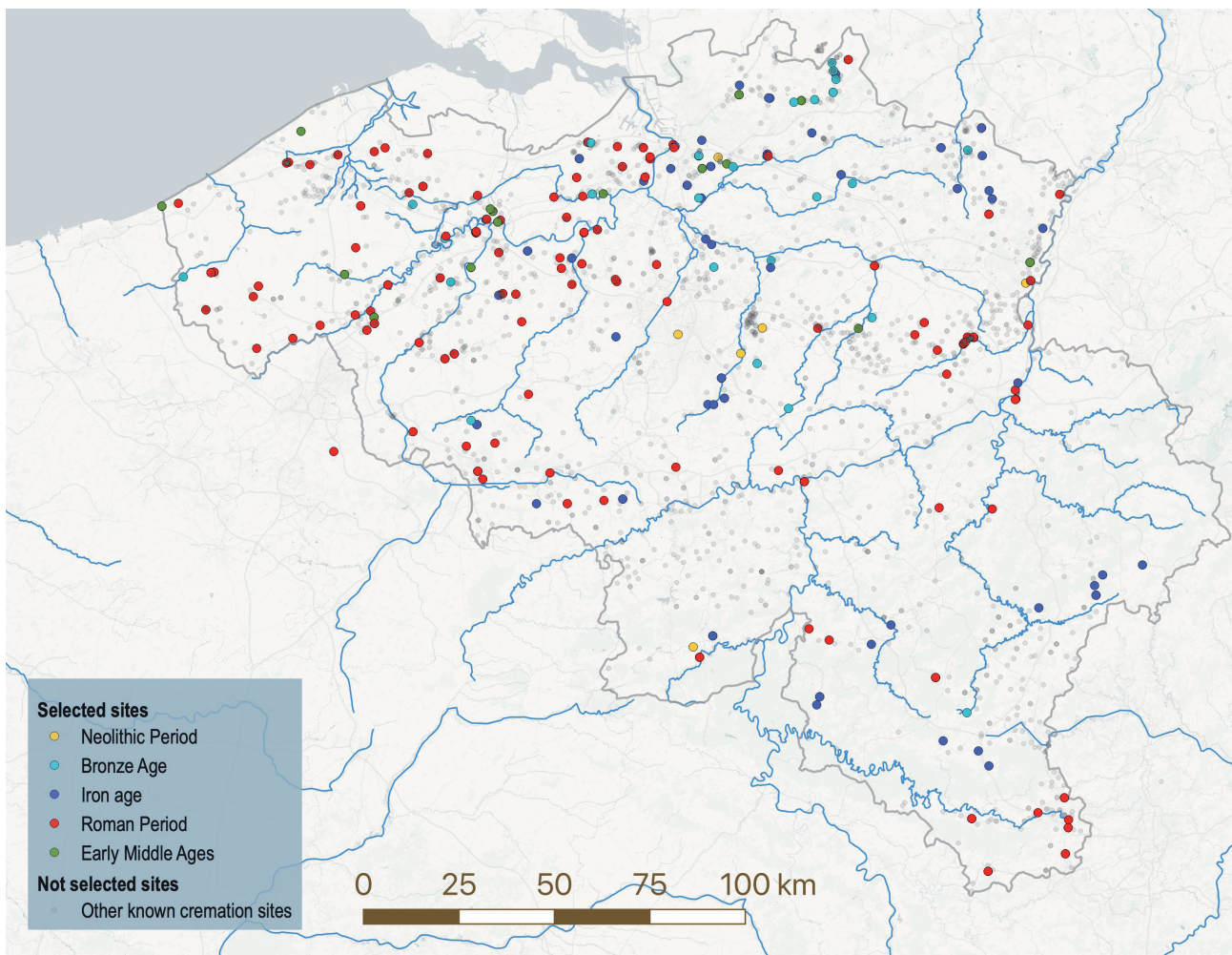


Fig. 2 – Map of selected sites for the CRUMBEL project.

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