

Evolution & Behavior

The European idea, a 5000 years old concept according to the Bell Beaker culture

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This Break was edited by Max Caine, *Editor-in-chief* - TheScienceBreaker

ABSTRACT

New "ancient-DNA" research sheds light on the networks that existed across the whole of Europe and northern Africa 5000 years ago. What motivated these networks? Economical trade, migrations of people, or a transfer of ideas from one community to the next? Using the genetic materials of burial sites all across Europe, some answers are starting to emerge.



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The 3rd millennium BC in Occidental Europe and Northern Africa is marked by the appearance of a very specific type of ceramic: the [bell beaker](#). As its name indicates, these beakers have the shape of inverted bells, and were decorated with various geometric patterns. They are found in well-defined natural and cultural contexts. Archaeologists, however, know from previous studies that there are no centralised production site for these ceramics. They do not reflect an economic network or a single group of people.

The questions researchers ask themselves, therefore, is *how* bell beakers happened to be used over such a wide geographical, cultural, and

chronological landscape. Was it through population movement, individuals or groups of people? By movement of the beaker itself – traded or gifted, for example? Or through a transfer of ideas, with populations or individuals learning from one another how to make such ceramics?

By answering these questions, the idea of territoriality and intercultural components of the societies of the 3rd millennium BC can be discussed and evaluated.

In order to investigate the question of population movement during the Bell Beaker phenomenon, Prof David Reich and Dr Inigo Olalde from the University

of Harvard conducted an ancient DNA (aDNA) study to which many scientists contributed, including our lab (laboratory of prehistoric archaeology and anthropology, Section of Earth and environmental sciences, University of Geneva, Switzerland). The aim of the study was to obtain the DNA of 400 individuals dating from the final Neolithic, the Bell Beaker, and the early Bronze Age from all over Europe, in order to define the population movements that might have taken place at the time. Of these 400 individuals, 226 are specifically attributed to the Bell Beaker phenomenon.

The method used consisted of extracting the ancient DNA from the skeletal remains of the individuals considered for the study, and comparing and contrasting their genome to one another according to geographical and chronological variants. The Y-chromosome, which is specific to the male lineage, was also investigated.

The results highlight the different processes that took place depending on the geographical region under consideration. It appears that the genome of the populations living in the Iberian Peninsula and Central Europe present many divergences, indicating that it was not a population movement that brought about the diffusion of the bell beaker ceramic from the former to the latter.

Great Britain, on the other hand, appears to have undergone no less than a colonisation from 2450 BCE onwards. This date (2450 BC) corresponds to the oldest bell beaker ceramics found on the island. According to the study, within a few centuries of the arrival of the Bell Beaker phenomenon 90 % of the local population had been replaced by individuals from mainland Europe.

Whilst population movements appear to have significantly contributed to the phenomenon in the

case of Great Britain, in the rest of Europe there are other clues to help us define the Bell Beaker culture. There are Palmela arrowheads in the Iberian Peninsula, stone wrist guards, engraved anthropomorphic stelae in the Alps, daggers, V-shaped bone buttons... We can also talk about specific structures: individual tombs in Central Europe, the use of communal tombs in Occidental Europe, some domestic structures...

None of these other components, however, follows exactly the bell beaker ceramic distribution, and none is found in Europe and Northern Africa alike. Some overlap with one another, some never cross. Meanwhile, some sites (funerary or not) appear as "meeting places", where rituals are performed regularly, sometimes over the course of several centuries. Examples include [Stonehenge](#) in southern England, or the Petit-Chasseur site in Sion, Switzerland. Such rituals must have contributed to the creation of social links between communities of the 3rd millennium BC, all over Europe and Northern Africa.

Thus far, the only known common denominator between all these components is the presence among them of the standard bell beaker.

These are thought-provoking results for researchers working on the topic, because they confirm that the populations of the end of the Neolithic lived within complex economic and social frameworks. Archaeologists and other scientists can now combine this new data with other lines of evidence (excavations, archaeological artefacts, isotopic research, etc...) to further untangle the past, in order to better understand how these communities of the 3rd millennium BC lived.