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Haunted by the ghost of the Beaker folk?

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A recent Europe-wide study of ancient DNA (aDNA) has exploded some of the preconceptions regarding a long-standing archaeological problem, otherwise known as the Beaker phenomenon. The study's results seemed to indicate that large numbers of people had migrated from continental Europe into Britain around 2500 BCE. In the course of this migration, the newcomers brought their belongings, including Beaker pottery, with them and replaced the pre-existing population and their ways of life. Or at least, this was how the research was presented in the media, e.g., 'Ancient-genome study finds Bronze Age 'Beaker culture' invaded Britain' or 'Did Dutch hordes kill off the early Britons who started Stonehenge?' (Figure 1). While the study's conclusions were actually more complex than the headlines suggested, its findings surprised many archaeologists; but had genetics *actually* solved the Beaker problem?

Stories of Beaker ghosts past

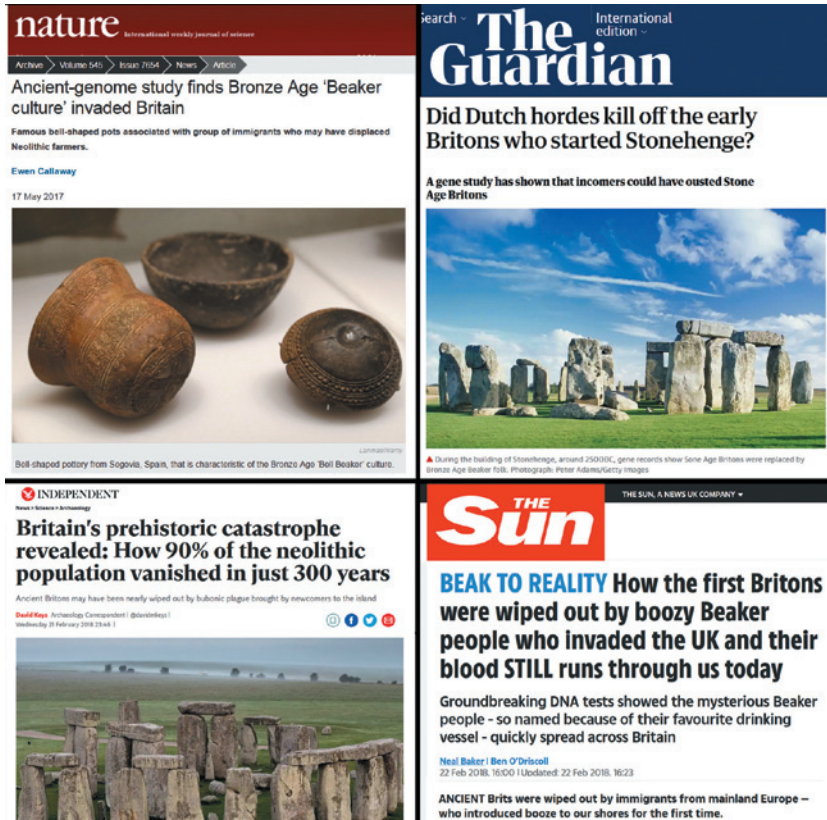
Figure 1. Headlines from various media outlets in 2017 and 2018 reporting on the Beaker aDNA study

For as long as there have been archaeologists, they have been puzzling over a distinctively shaped and highly decorated ceramic dating from over 4500 years ago (Figure 2). They labelled this 'Beaker pottery' because

it was initially considered a drinking vessel. The pots had been rapidly circulated across much of western and central Europe during a period that many archaeologists refer to as the Copper Age. These Beakers are often found in association with a distinctive burial type, represented by an individual in a crouched position with a recurrent assemblage of grave gifts including stone wrist-bracers, arrowheads and early copper or gold objects (Figure 3). Altogether this came to be known as the Beaker phenomenon, because so many aspects including its origins, character and social significance have all defied simple explanations. In particular, there has been considerable debate regarding how and why the seemingly rapid and widespread transmission of this suite of novel social practices and material culture, including Beaker pottery and other objects, occurred.

In the early 20th century, archaeologists grouped related objects and traits with a clear geographic distribution and chronological horizon together to form archaeological cultures. These classificatory units were problematically considered to represent distinct bounded groups of people who all shared the same material traits. The geographic distribution of such cultures was exclusively explained with reference to large-scale ethnic migrations or invasions. It was in this context that the recurrent discovery of Beaker pottery, and other objects with a stereotypical burial type, in parts of Europe was seen as representing the physical traces of so-called 'Beaker people' or 'Beaker folk'. This putatively distinct population group were thought to have colonized much of Europe.

By the 1960s, the tendency to attribute all cultural change to invasions and migrations by cultural groups





was regarded as highly problematic. Instead, archaeologists now considered Beakers to be part of a 'Beaker package' that was circulated through exchanges between various indigenous groups. This seemed to better reflect the diverse ways in which a restricted selection of very similar kinds of Beaker-related objects occur in many regions.

Stories of Beaker ghosts present

The role of migration in explaining cultural change remained abandoned until newly developed scientific techniques were applied in the last decade or so. These enabled the detection of prehistoric human mobility and demographic change in ways that were previously impossible. Initially, the examination of strontium and oxygen isotopes in the teeth of Beaker burials indicated the occurrence of at least some small-scale people movement by those who used Beaker pottery. This was exemplified by isotopic analyses of the 'Amesbury Archer' and 'Boscombe Bowmen' burials from Wiltshire in southern England showing that the former was probably born in the Alpine region, while the latter may have come from Wales, Ireland or Brittany.

More recently, various aDNA studies have discovered evidence for a significant level of migration associated with so-called 'Steppe genes'. This is a distinctive genetic signature represented by the Y-chromosome lineage R1b-M269, which is one of the most common haplogroups found among males in European populations today. It originated in the Pontic steppe

region of present-day Ukraine but was newly introduced to Europe during the 3rd millennium BC (see Figure in Llamas and colleagues p.18, in this issue). In 2018, the 'Beaker bombshell' study of the genomes of 400 individuals from Neolithic, Copper and Bronze Age Europe including 226 Beaker-associated burials was published by Inigo Olalde, David Reich and others.

Analysing over 1,200,000 single nucleotide polymorphisms (SNPs) and comparing to modern-day individuals genotyped on the Affymetrix Human Origins Array, the study revealed that some of these Beaker burials from Germany, the Czech Republic, southern France, northern Italy and Britain displayed high levels of this same Steppe-related ancestry. Based on this, they argued that a major westward migration of 'Steppe genes' into northwest Europe occurred in association with the spread of Beaker-related material traits.

This apparently Beaker-associated genetic transformation was most evident in Britain. The earliest known presence of people on this island with the distinctive 'Steppe' genetic composition seems to have occurred around 2450 BC in tandem with the introduction of Beaker-related material culture. Their arrival from continental Europe is thought to have resulted in the replacement of 90% of the pre-existing Neolithic gene pool with Steppe genes over a few hundred years. These results, and their characterization in the media, came as a surprise to many archaeologists because they revealed considerably more evidence for human mobility in the 3rd millennium BC than many archaeologists had expected.

Figure 2. A selection of Beaker pottery that was found accompanying the 'Amesbury Archer', Wiltshire in southern England (Courtesy of Wessex Archaeology)



Figure 3. A Beaker cist burial from the Mains of Catterline, Aberdeenshire, Scotland, which contained the remains of a man and a Beaker (Copyright University of Aberdeen)

The study sparked considerable ongoing discussion regarding the broader implications of aDNA analysis for archaeology. It raised important, but long unanswered questions about the scale and nature of human mobility during the 3rd millennium BC. However, it also caused consternation among the archaeological community because it seemed to resurrect old-fashioned narratives about large-scale invasions and reopen old debates about the extent to which the spread of the Beaker complex was a population-based process. All of which represent topics that archaeologists have largely avoided in recent decades. Arguably, this can be seen as a bid to distance themselves from the overtly nationalist and colonial aspects of the approaches that initially dominated the discipline, and its readings of the past. Indeed, there is appropriate ongoing concern about the ways in which headlines and the shorthand version of the results themselves are prone to being co-opted for political purposes at a time when migration is sadly both a contentious and divisive issue. In contrast, some archaeologists claim that the Beaker-associated demographic transformation in Britain was the result of the violent replacement of pre-existing Neolithic populations by murderous male migrants. However, evidence for increased levels of violence at this time is lacking and the aDNA analysis shows that both men and women with ‘Steppe’ genes came to Britain.

Significantly, the Beaker genomics study also included analysis of the aDNA of 37 Beaker burials from Spain and Portugal. Those results have received

comparatively less attention, even though they show that the aDNA from these Beaker burials contained very low levels of Steppe-related ancestry. Instead, their genetic profile remained the same as the preceding Neolithic population in the area. In other words, this indicates that the transmission of Beaker pottery across Europe was not exclusively driven by migration and the genetic composition of those who used Beaker pottery across Europe was quite diverse. This serves as a useful reminder that the Beaker ‘culture’ was a human-made social phenomenon, not a biological condition. It resulted from a complex series of interactions between different people in various parts of Europe, some of which clearly involved travel and movement.

Many archaeologists (myself included) have found it hard to reconcile an apparent contradiction between the genetic and archaeological evidence from Britain for this period. The archaeological record clearly indicates that the Neolithic population of this island continued to exert a strong cultural influence long after the arrival of newcomers and new technologies and objects during the Copper Age. Simply put, it seems that new ideas, objects and people were incorporated/integrated into older ways of life. For example, Beaker pottery took on many of the roles previously associated with British Neolithic ceramics in everyday and more ceremonial settings. The repeated discovery of Beakers and related objects at older Neolithic sites, like the West Kennet long barrow in Wiltshire, also indicates a concern with historically important places. New Beaker-associated wrist-bracers were made using a distinctive type of green stone from the Langdales in Cumbria that had been the main source for Neolithic polished stone axes.

This continuity of customs is not highlighted here to suggest that migration did or did not occur during this time frame. Cultural continuity cannot be equated with population stability. Similarly, migration in itself does not automatically result in cultural change. Humans actively and selectively participate in cultural traditions in diverse ways and so newcomers and indigenous groups respond to each other’s material traits fluidly. Therefore, it is important not to assume that a person’s genes or origins will determine their cultural traits. Nevertheless, it remains hard to understand how newcomers could have been so strongly influenced by the people of Neolithic Britain, if they had been rapidly and almost completely replaced during the introduction of the Beaker phenomenon.

Currently, the exact timing of the genetic changes that have been identified is quite unclear. The Beaker aDNA samples come from inhumation burials, a practice that re-appears in Britain (after a considerable hiatus of at least 600 years) as part of the adoption of the Beaker phenomenon. However, this burial rite did not become

widely practiced until after 2200 BC and hence, most of the aDNA samples in the study come from burials that post-date the earliest appearance of Beaker pottery on this island by at least 300 years. Therefore, it has not yet been demonstrated that the arrival of people with Steppe genes in Britain occurred in tandem with the spread of Beaker-related material traits. These changes may not have happened at the same time or been closely interconnected.

But yet, it has been claimed that there must have been a direct causal link between the demographic and cultural changes that happened in Britain during the 3rd millennium BC. This is a curious assumption that seems to echo the highly problematic approaches that characterized early forms of archaeology and resulted in the construction of a mythical 'Beaker folk'. Indeed, both geneticists and archaeologists have recently highlighted that the terminology used in ancient genetic studies are the same as archaeologist's original labels for cultural groupings (e.g., Beaker culture). They argue that it is misleading to refer to population groups in that way because it gives the false impression that biology and culture are strongly linked. It also lacks awareness that archaeological cultures are highly arbitrary units of classification created in the 20th century that do not reflect a past reality. There is insufficient evidence to indicate that population replacement occurred as profoundly or suddenly in Britain c. 2450–2200 BC as has been claimed.

Stories of Beaker ghosts future?

In many ways, we are at an exciting crossroad: aDNA research is currently raising as many questions as answers about the past. Thanks to the 'Beaker bombshell' study, archaeologists must now engage more deeply with the many important but unanswered questions about the Beaker phenomenon. This and other recent genomic studies have made a vital contribution to understanding the human past by providing firm evidence that people were moving across Europe during the Copper Age. This enables archaeological discussion to move beyond the old debates about whether migration happened or not. Instead, research can now focus on better understanding how, when and why people were moving across Europe. This will require archaeologists and geneticists working closely together to explore the complexity of the surviving evidence. ■



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