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Violent Deaths in the Development of the Farming Economy: The Case of Bury

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Abstract

Many recent publications have tended to emphasise warfare and violent deaths during the emergence of the farming economy, linking the expansion of early farmers with inter-group conflicts. Cases of violent deaths have also been identified in other periods of the development of Neolithic communities. The collective grave of Bury in the Paris Basin provides one particular deposit, dated from the late 4th millennium cal BC and composed of a group of individuals, arranged in a specific position in the northeast corner of the monument. The central individual of the deposit, an adult man, showed clear signs of violence. The archaeological context and the formal chronological modelling, undertaken by using a large series of radiocarbon dates, enable more precise estimates of the timing and duration of the depositional events, which took place within the burial chamber. The results demonstrate the ritual role of such violent deaths, which are particularly frequent in periods of change.

Introduction

The earliest evidence for a farming economy has been identified in Europe between 6800 and 3600 cal BC, depending on the regions (Zilhão 2001; Forenbaher/Miracle 2005; Tresset/Vigne 2011; Whitehouse et al. 2014). Many recent publications have tended to emphasise spectacular signs of violence in these early phases of the Neolithic, linking the different stages of the farmers' expansions with inter-group conflicts (e.g. Wild et al. 2004; Meyer et al. 2015). Later cases of violence, however, have been less discussed. Many have been recorded in the collective and monumental constructions, which were widely distributed across Western Europe in the 4th millennium cal BC (Baye 1874; Guilaine/Zammit 2001; Schulting/Wysocki 2005). Instances of killed individuals were normally deposited among the rest of the buried population, and regularly show evidence of lethal injuries by arrows, as in the most obvious example of San Juan ante Portam Latinam in north-east Spain, dated circa 3200 cal BC (Vegas et al. 1999). A close examination of archaeological contexts shows a complex reality, in which a population could manage violence within the group, as in the Bury case.

The Bury *allée sépulcrale* (or gallery grave in older English terminology), located in the Oise Valley, provides a long (though not continuous) sequence of deposits dated from the late fourth to the beginning of the second millennium cal BC (Salanova et al. 2017). During the first phase of use, a particular group of individuals was deposited and arranged in a specific position in the northeast corner of the monument; one of the individuals bore clear marks of violence.

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The stratigraphy of the successive uses of the monument and the formal chronological modelling based on a large series of radiocarbon dates is a rare example, which enables a discussion on the context of violent deaths.

Materials and Methods

The Bury allée sépulcrale

Particularly well represented in the Paris Basin, where some four hundred collective graves have been recorded, collective burial practices are characterised by successive deposits in underground constructions of rectangular shape, made with varying building techniques. These contain dozens to hundreds of dead individuals buried over the course of several centuries (Bailloud 1974; Chambon 2003). The emergence of these constructions has justified the definition of a new stage within the regional chronology (*Néolithique récent*: Late Neolithic), although the typology and the technology of the associated material culture (pottery, bone and flint tools) evolved without major breaks compared to the previous periods (Salanova et al. 2011). Unfortunately, as in other areas, the majority of these graves were discovered before modern excavations, so much so that the precise chronology and the development of their use, from their building to their definitive closure, are still rarely known (Salanova 2000).

The Bury monument has a burial layer composed of more than 300 individuals and animal bones deposited over an overall chronology of more than one millennium, interrupted by a major break at the transition between the 4th and 3rd millennia cal BC (Salanova et al. 2017). Among the most frequent practices identified for each period, some of them were contemporaneous, including skull removals and rearrangements of space. Other practices make it possible to perceive a chronological trend, mostly based on the change from the extended to the crouched positions of the bodies. Some individuals deposited in the northeast corner of the grave are particularly notable for their arrangement, their location and the violence recorded on one of the skeletons. The adult cranial vault in question bears the marks of three lesions, which can be interpreted as lethal, corresponding to fractures which occurred *perimortem* and which were caused by the impact of a thick, heavy, sharp and almond-shaped instrument, most probably an axe (Fig. 1).

Fig. 1. Cranium of individual no. 3 showing two almond-shaped injuries; hole sizes and cracks indicate fierce blows. A third lesion is located at the base of the skull, close to the foramen magnum.

Bone study and reconstruction of funerary behaviours

The location of the Bury excavations in a private garden affected both the archaeological methods, with an objective of maximum efficiency to limit the duration of the excavations, and the extent of the fieldwork, with the impossibility of investigating the immediate surroundings of the grave. The cross-section made by the owners of the garden prior to the excavation and the pottery fragments recorded during the first archaeological works revealed a compact stratigraphy of deposits. To understand the successive episodes that occurred in the grave, the positions of all of the remains (bones, grave goods and architectural elements) were recorded in the same manner. Sediment from the chamber was systematically sampled and sieved.

The bone study followed the methods first used for the *hypogée* (hypogeum) of Les Mournouards to reconstruct funeral behaviours, in the sense of Leroi-Gourhan's "ethnologie préhistorique" (Leroi-Gourhan et al. 1962). Special attention was paid to the anatomical sets, from almost complete skeletons to partial articulations or bones still reflecting some anatomical order. During the laboratory analyses, the osteological study was focused above all on the skeletons' reconstruction. Using pairings, articulation congruence, age, pathological individualisation and, finally, anatomical coherence correlated with topography, more than 200 individuals have been identified and located in space and in stratigraphy. It has therefore been possible to analyse the conditions of their deposition, which means their burial position, decay and the displacements of bones. This part of the study used the assumptions of taphonomic analysis, developed in France after Poplin (1975) and theorised by Duday (1995) concurrently with the work of Ubelaker (1974) on Potomac ossuaries. Basic anthropological determinations use the most reliable methods for prehistoric remains. To the extent that a dental arcade can be assigned to a non-adult individual, age is based on tooth calcification (Moorrees et al. 1963a and b). For adults, the sacroiliac joint is the preferred method, after Schmitt and Broqua (2000). A sexual determination was made only for adults, using the hipbone; metrical and morphological approaches were used concurrently (Bruzek 2002; Murail et al. 2005).

Chronological modelling, sample selection and radiocarbon dating

The principle behind the Bayesian approach to the interpretation of data is encapsulated by Bayes' theorem (Bayes 1763). This proposes that new data collected about a problem ('the standardised likelihoods') are analysed in the context of existing experience and knowledge of that problem ('prior beliefs'). The combination of the two permits a new understanding of the problem ('posterior beliefs'), which can in turn become prior beliefs in a subsequent model. Bayesian chronological analysis brings together archaeological information and radiocarbon dates by expressing both as probability density functions, which are also the form of the posterior beliefs.

In the modelling of archaeological chronologies, the 'standardised likelihoods' component of the model is most commonly formed by calibrated radiocarbon dates and the 'prior beliefs' by archaeology, so that the radiocarbon dates are reinterpreted in the light of the archaeological information to provide posterior beliefs about the chronology. Such estimates will vary with the model or models employed, whereby several different models may be constructed based on varying interpretations of the same data (Bayliss et al. 1995; Buck/

Juarez 2017). The purpose of modelling is to progress beyond the dates at which individual samples left the carbon cycle to the dates of the archaeological events associated with those samples.

The chronological modelling has been undertaken using OxCal 4.2 (Bronk Ramsey 1995; 1997; 2009; Bronk Ramsey et al. 2010; Bronk Ramsey/Lee 2013; https://c14.arch.ox.ac.uk/oxcal/OxCal.html) and the internationally agreed calibration curve for terrestrial samples from the northern hemisphere (IntCal13; Reimer et al. 2013). Its starting point was the stratigraphy and taphonomy of the burial deposit together with the analysis of the human remains. This made it possible to identify bones that were still in articulation or only slightly displaced from articulation when excavated, in other words bones that were still connected by soft tissue when they reached their final location and which were hence probably contemporary with rather than earlier than their stratigraphic positions – an important consideration in a collective burial where human remains were progressively rearranged and reworked. It also made it possible to sample through sequences of successive burials, using the stratigraphic relationships between them to constrain their age ranges. Simulation models were run to determine the most efficient sampling strategy within each stratigraphic sequence. Consideration was also given to the security of the superposition of individuals. For example, a fully articulated skeleton is more certainly in its original position than an individual represented by a few grouped bones. Some disarticulated bones were, however, dated where they could provide *termini post quos* for other samples or for construction events within the tomb.

The model for the chronology of the first phase of use at Bury employs radiocarbon dates for 87 samples of human bone, all but one of them articulated or capable of being rearticulated, from 73 individuals. Several are replicate measurements on samples from the same individual. In these cases, a weighted mean has been taken of the measurements for each individual before incorporation in the model. The measurements were made by the Centre de Datation par le Radiocarbon, Lyon, the Centrum voor Isotopen Onderzoek, Rijksuniversiteit Groningen, the Oxford Radiocarbon Accelerator Unit and the Scottish Universities Environmental Research Centre, East Kilbride. All four laboratories maintain continuous programs of internal quality control. They also take part in international intercomparisons (Scott 2003; Scott et al. 2007; 2010).

Results

A particular deposit at Bury

The group of individuals discovered in the northeast corner of the grave includes one male adult of at least 40 years of age (no. 3) and four children (Fig. 2). These individuals were installed as corpses. Large parts of their skeletons were still articulated when excavated, and most of their bones were recovered, considering the collective burial context. No intervention on the bones after decomposition was observed, except on child no. 14. The skull, together with the first cervical vertebra and the right tibia, was moved and installed between the adult femurs. The other displacements are due to the decomposition process or disturbances during the subsequent use of the grave. Except for injuries on the adult skull, there is no mark of a specific treatment on the bones.

The skeleton of the adult man (no. 3) was almost complete. The preservation of articulations for lower limbs and the pelvic girdle has made it possible to directly read the position of this part. The upper

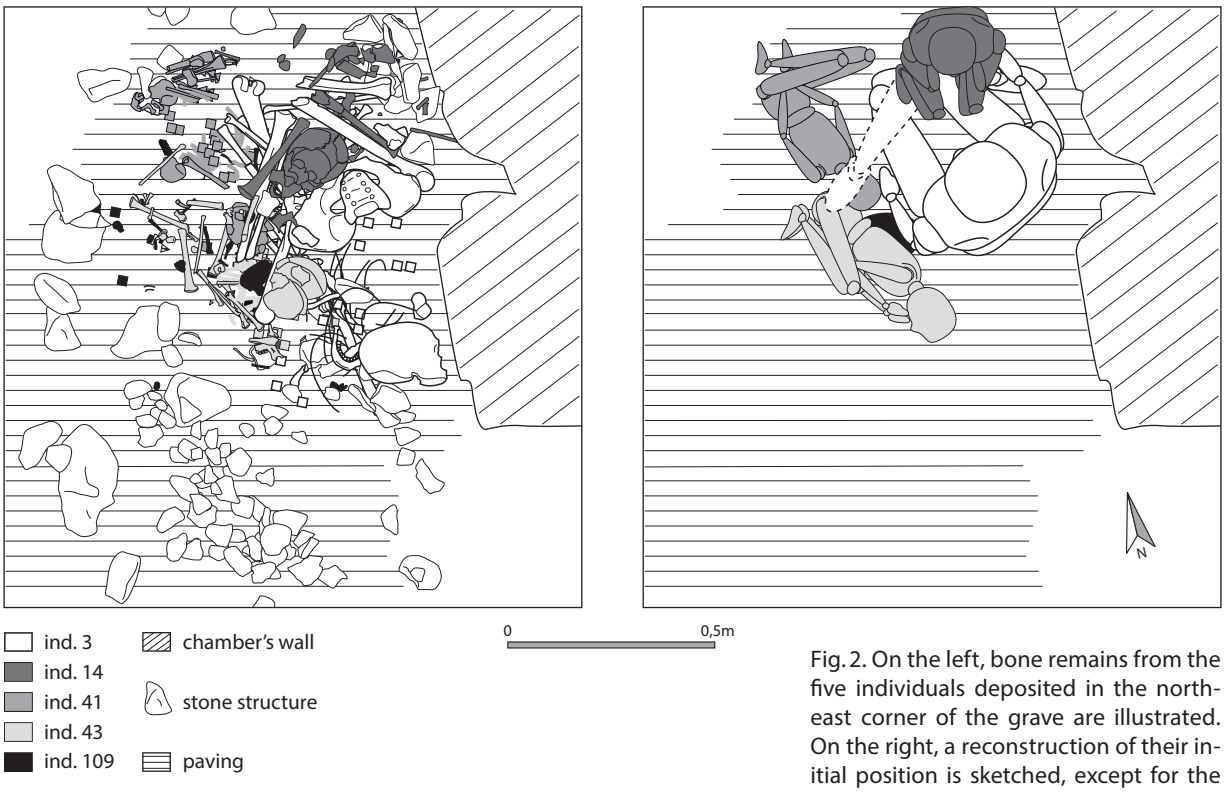

Fig. 2. On the left, bone remains from the five individuals deposited in the north-east corner of the grave are illustrated. On the right, a reconstruction of their initial position is sketched, except for the youngest (no. 109), whose position could not be determined due to the age and the poor preservation of the skeleton.

view of the pelvic girdle and the cross-legged situation clearly indicate that the body was seated. The location close to the wall of the grave supports such a position. The upper part of the skeleton collapsed during decomposition. The skull and mandible were dislocated, suggesting that they fell down from a higher position; the upper limbs appeared partly connected due to the quick disruption of the scapula from the rib cage; and the cervical and thoracic levels of the vertebral column were completely dislocated. The locations of the skull and mandible also result from collapsing.

Around the adult, three children and a perinatal individual were distributed. The initial position of the youngest individual (no. 109) could not be determined, due to the age and the poor preservation of the skeleton. No joints were preserved, but the main part was discovered mixed with the other individuals. Two other children were deposited in a crouched position. The skeleton of individual 14, 6–7 years old, was patchier due to the destructions at the end of the use of the grave. For the bones that remained *in situ*, the location of upper and lower limbs in the same place also speaks in favour of a vertical position, squatting rather than sitting. The head (cranium, mandible and atlas) together with the left tibia were placed between the upper legs of the adult. The preservation of the craniomandibular joint implies that either these skull parts were tied or the neck was cut between the atlas and the axis. No cut marks were recorded on the atlas, and the axis is missing; thus, it is difficult to answer the question definitively. Located in front of the adult, skeleton 41, 3-7years old, remained mainly articulated. The upper part of the skeleton lay on its back, whereas the lower limbs were flexed on the right side, the tibia against the femur. Whether the individual was in a vertical position is difficult to prove; he or she may have collapsed soon after being deposited. Regardless of the latter, the contraction of his or her lower limbs suggests some type of wrapping. Apart from late disturbances that affected the left limbs, the bones remained in their situation of decay. The position of individual 43 is most convincingly crouched on its left-hand side. The joints of individual 41 are mostly

preserved despite the young age and the context. The bones can be inscribed in a rectangle, which may indicate that the individual was deposited within a box. One of the two adults secondarily associated with this group partially covered individual 43, leading to slight joint disruptions.

The context within the grave

The group of individuals just described was the first deposit in the northeast corner of the grave, placed above the paving of the chamber. According to the field observations, the first individual to be placed was the adult. He was sitting with his back to the chamber, facing north. The oldest child (no. 14) was inserted between the adult and the rear of the monument, facing the chamber. The two other children (no. 41 and no. 43) were deposited to the left side of the adult. All individuals had distinct burial conditions, but all of them were unusual in the grave context. An arrangement of stones was found around them, forming a circular structure disturbed by the succeeding events that occurred in the grave. Thus, it is difficult to evaluate the protective role of this feature. However, all the reorganisations of the kind that frequently occur in a collective grave avoid this setting, in particular the adult, suggesting that this deposit was respected over several generations, at least until the mid-3rd millennium cal BC.

The extreme end of the monument, where the group was deposited, was reachable during the entire first phase of the grave (later 4th millennium cal BC), owing to a corridor left free of deposits, and even after that by a passage fitted in the eastern wall of the chamber (Fig. 3). The other individuals deposited in the proximity were in an extended position on their back.

Although a large number of bodies were placed on the other side of the chamber and close to the group, none were deposited among

Fig. 3. Rear part of the chamber with the bones of identified individuals: in dark grey the set of five individuals in the northeast corner. The location of the deposit within the whole monument is indicated in the left insert.

or above them during the first phase of the use of the grave. Only two adults were subsequently and finally inserted into the structure, also in unusual positions (constrained, tied or seated), placed at the side of the main character (individual no. 3) but without covering the group. During the 3rd millennium cal BC, a small part of an individual (a forearm) was deposited, and some isolated bones were displaced, forming a rectangular structure similar to a reduced-size *allée sépulcrale* (Fig. 4).

Fig. 4. Northeast corner of the monument around the end of the 2nd phase of use (mid-3rd millennium BC). The inferior part of adult no. 3 is still visible, as well as the skull of child no. 14. During this period, a new rectangular feature was formed, reshuffling late burials (bones in black grey).

Chronological modelling

Constructing a stable chronological model for the Late Neolithic use of the Bury monument (first phase of use) has been challenging. The strength of the dataset lies in the matrix. Long sequences of successively buried individuals provide high levels of constraint and hence, potential precision. The weakness of the dataset lies in the age of the burials. Long strings of stratigraphic relationships are crowded into an exceptionally unfriendly area of the radiocarbon calibration curve in the 33rd and 32nd centuries cal BC, where wiggles and plateaux in the curve make for extended and bimodal probability distributions.

The first phase of the monument probably dates from the 33rd to 32nd centuries cal BC, perhaps only to the 32nd if its start can be pinpointed to the later of two peaks of probability, from *3245–3190 cal BC (63% probability)* or *3170–3135 cal BC (32% probability)* to *3195–3165 cal BC (21% probability)* or *3145–3095 cal BC (74% probability)*. Human remains were probably deposited there for *1–60 years (56% probability)* or *65–130 years (39% probability*; Fig. 5). Within this span, which is very short even at the longer estimate, the members of the first deposit for which there are radiocarbon dates (nos. 3, 14 and 43) could have died simultaneously (Fig. 6), given that the measurements for all three are statistically consistent, as determined by a χ^2 test (T′=0.9; T′(5%) = 6.0; ν = 2; Ward/Wilson 1978).

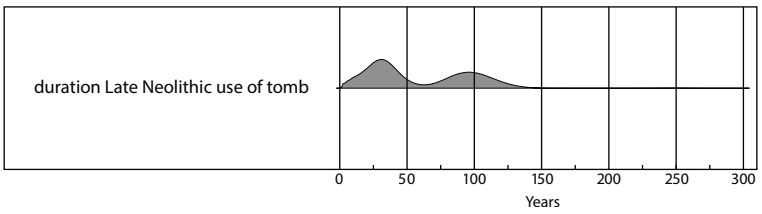

Fig. 5. The estimated duration of the Late Neolithic use of the tomb (first phase), derived from the same model as the distributions in Fig. 6.

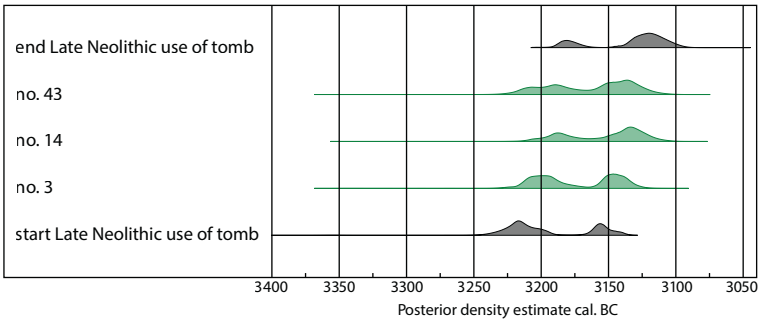

Fig. 6. Highest posterior density intervals for the estimated start and end of the Late Neolithic use of the collective grave at Bury (first phase) and for three individuals from the group of burials presented in this article (in light grey). These are derived from a Bayesian model defined by the CQL2 code provided as supplementary information. The individual dates are constrained by the information incorporated in the model.

Discussion

According to the data, the deaths of at least four individuals from the deposit could derive from a unique event. However, the simultaneity of their deposit is difficult to prove by the chronological modelling, the bone study or the archaeological context. Knowing the nature of the links and containers, not preserved as usual in this geographical area, would have indeed been essential to precisely analyse the duration of decomposition of each burial and the stratigraphic order. The pre-eminence of the man in the group of early deposits could mean that this scene particularly refers to male development and even to fatherhood. However, no specific attribute indicates a sexual distinction. aDNA analyses are in progress, but these will only partly answer the question about the way the population from the 4th millennium BC considered their relationship. The children placed in the surroundings could also depict a scene that is linked to different stages in a life cycle, from birth to adulthood.

If this particular group of individuals did not correspond to the founding act of the monument, then it nevertheless had played an important role in rituals, affecting the organisation inside the rear part of the funerary chamber and only in this part. Other particular deposits have been identified, such as a grouping of skulls in the front part of the chamber, but the remains of the northeast group were the only ones respected during the first phase of use, despite the modification of the burial practices in the rest of the burial chamber, and until their covering by new bodies in the mid-3rd millennium cal BC. It shows that change in burial practices took place over a long period of time.

Conclusion

Due to the rarity of precise excavations, the Bury case is currently isolated in the context of the collective monuments from the 4th millennium cal BC in the Paris Basin. It demonstrates how violence took place within the intimate space of a human group, the monument of a community. More generally, it highlights the moments in which violence was most openly expressed during the Neolithic periods. At Bury, it is placed just before a period of important changes in ritual

practices (second phase of the grave use: Salanova et al. 2017). At a regional level, this period of change is characterized by the gradual closure of the collective monuments. This case could be compared with the particular ritual practices which were recorded at the end of the Early Neolithic both in southern and northern continental Europe, just before another period of economic intensification (Chaix et al. 1991; Wild et al. 2004; Le Bras-Goude et al. 2010). This comparison has, however, to be supported by research on a wider scale.

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