Rocks of ages: tempo and time in megalithic monuments

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Chronology remains a problematic area in prehistoric archaeology but the increasing number and precision of radiometric dates begin to suggest patterns that can be resolved down to the scale of individual lifetimes. The study of megalithic monuments has benefited from these developments but remains hampered by the indirect relationship between the materials that are dated and the structures themselves. Drawing on evidence from France, Scandinavia and Iberia, it is nonetheless arguable that available patterns of dates suggest an event-like tempo to the construction of megalithic monuments, with large numbers being built within relatively short periods of time. This has implications for typological models and for the social context in which such monuments were designed and built.

Key words: AMS dating, chronology, megalithic monuments, Neolithic, passage graves, typology

Prehistoric chronology in archaeological texts has usually been discussed on scales far removed from that of ordinary human lifetimes. Explanations couched in the long-term, or in temporal vagueness, may be appropriate for certain types of archaeological question, but they frustrate the understanding of key sequences and developments. One response to this has been the concept of 'time perspectivism', which studies how differences in the temporal scale and resolution of archaeological datasets constrain or expand the questions we can investigate (Bailey 2007). Even long-term phenomena such as climatic or environmental changes will have been perceived within the experience of individual lifetimes, however, and it is only with the increasing precision of archaeological dating techniques that we can begin to understand change

from the standpoint of prehistoric societies and their individual members.

Many kinds of archaeological material remain difficult to date since they are inherently unsuitable for the direct application of radiometric methods. In these instances, chronologies are forced to be reliant on typology, or on the dating of associated material such as charcoal or bone. Such is the case with the Neolithic chambered tombs of Western Europe. The challenge in dating these monuments varies from region to region depending upon the local geology. Where conditions of preservation allow, human skeletal remains generally provide the most satisfactory approach. That assumes, however, that there is a direct connection between a particular episode of funerary activity and the construction of the monument, an assumption that may not always be secure. The danger of residual material can be illustrated by examples where the radiocarbon chronology does not match well-founded expectations of age based on monument typology. Such may be the explanation at Bougon in western France, for example, where the earliest dates from the basal layer within the chamber appear to be half a millennium older than is consistent with the dating of other burial monuments of this type (Scarre et al. 2003; Mohen and Scarre 2002). The stratigraphic context is secure, and the samples were dated by two separate laboratories, so that it is difficult to account for the discrepancy in any other way. In other cases, there is evidence to suggest that a tomb was entirely cleared of its contents at some stage during its use, with the consequence that the majority of the associated human remains belong to an episode of reuse that occurred at an uncertain interval of time after the initial construction of the tomb. A good example is provided by the *allée couverte* (gallery grave) of La Chaussée-Tirancourt in northern France, where a whole layer of burials appears to have been removed, leaving only a handful of inconspicuous bones trodden into the chalk floor of the

tomb that the cleaners overlooked (Masset 1997, 104).

The multiplication of AMS radiocarbon dates for human skeletal material from Neolithic chambered tombs has nonetheless revolutionised our grasp of their chronology. More importantly, in favourable circumstances it allows us to generate precise chronologies that reduce the broad spans of vaguely defined prehistoric time to the historical specificity of individual life spans and generations. This has had a major impact on our understanding of Neolithic burial monuments. In the first place, precision-dating of monuments and the deposits and activities associated with them allows them to enter more fully into the discussion of memory in the societies in question. That is borne out by recent AMS dating (backed by Bayesian statistics) of a series of Early Neolithic long mounds in southern Britain, which found that the monuments most similar in form were not necessarily the closest in time.

Such a conclusion challenges the assumptions of standard typological approaches and enables new questions to be considered. Did these monuments of the dead consciously evoke a timelessness of tradition, or deliberately copy older monument styles “to align themselves with earlier generations and their renown?" (Whittle and Bayliss 2007, 25). The newly precise dating also enables us to contemplate the implications of a tight and rapid sequence of events assignable to periods of a few generations. We can now ask, for example, whether the building of the Ascott-under-Wychwood chambered cairn was witnessed by a child or juvenile who then in old age was able to direct the construction of Hazleton North (Whittle et al. 2007:132)

Setting the question: typology and chronology

Armed with these new perspectives I wish to return to a question that I raised some years ago, in respect of the typology and chronology of the Neolithic chambered

tombs of the Armorican massif of northwest France, and their relationship to issues of timing, tempo and change (Scarre 2001). This is a region of acidic soils where the absolute dating of monuments has been hampered by the scarcity of associated human remains available for radiocarbon dating. AMS dating (in particular the use of smaller sample sizes) has to some degree ameliorated the problem but reliable radiometric dates are still much less numerous than would be required to construct a detailed and secure chronology.

The generally accepted sequence of monument forms and their chronology (Boujot and Cassen 1993) relies heavily on the model of typological succession and on the dating of associated artefactual material. This is the latest in a long series of architectural models to be proposed for the Breton monuments. The Reverend William Lukis in 1868 noted the wide variety of megalithic chambers encountered in Brittany, and concluded that "these forms indicate not merely a long residence of their builders in this country, but, as I believe, a progress in constructive science" (Lukis 1869, 219). Some decades later, Zacharie Le Rouzic argued that the Morbihan sequence began with the low earthen mounds, which were followed by passage graves with corbelled vaults, and those in turn by passage graves roofed by capstones and *allées couvertes* (Le Rouzic 1933). Such schemes may be compared with those for other regions of Europe such as Ireland or Galicia that propose cycles of development from small and simple to large and complex and then back to simple again (Sheridan 1986; Criado Boado and Fabregas Valcarce 1989).

These models advocate general principles of development, for instance that long mounds preceded circular mounds, or that passage graves morphed gradually into 'gallery graves' in which the distinction between passage and chamber was eventually erased. In so doing they make a number of key assumptions. In first place, they

envisage a process of progressive replacement, where one monument form is succeeded across an entire region by another. Thus long mounds are replaced and succeeded by passage graves, and they in turn undergo a process of 'evolution' extending over a period of perhaps several centuries. In second place, these models may all too easily give the impression that the succession of monument forms was gradual and spread out evenly through time.

That is not an inevitable reading of a typological scheme of this kind. The prominence and durability of Neolithic monuments would have left them as models to be copied by subsequent generations even had there been breaks in the sequence of several centuries or more. Without the benefit of reliable and detailed absolute dating, however, it is impossible to determine whether monument-building was a continuous process, or whether it should be envisaged more as a horizon-type event, where large numbers of tombs were constructed in relatively short bursts. The implications of such an alternative model for the social and ceremonial context of tomb building and the transmission of knowledge across the generations are clearly profound.

The potential pitfalls may be illustrated by considering one particular monument situated to the south of the Armorican massif in the sedimentary basin of west-central France. The site is the long cairn of Prissé-la-Charrière, built in limestone terrain where human bone is well preserved (Laporte et al. 2002; Scarre, Laporte and Joussaume 2003; Soler et al. 2003). A ten-year campaign of excavations from 1995 (since continued by Luc Laporte) revealed a complex structural sequence, beginning at the western end with a small, probably closed megalithic chamber within a circular dry-stone surround. This was subsequently enclosed within a rectangular cairn encircled by a substantial rock-cut ditch, which was then extended massively to the east to create a 100m long cairn. The new enlarged monument contained two passage

graves, one of them integral to the extension, the second a pre-existing monument that had stood as a separate structure within its own circular cairn. This brief outline illustrates the complexity of the structural sequence, which involved funerary spaces of different kinds, and the deliberate infilling of the earlier rock cut ditch. In traditional typological terms, the closed chamber within its dry-stone surround would be considered an earlier form than the passage graves. Analogues can indeed be found along the Atlantic façade of France, from Brittany to the Pyrenees (Scarre, Laporte and Joussaume 2003). What is remarkable, however, is that the sequence of AMS radiocarbon dates on human skeletal material (mostly disarticulated) relating to the successive structural phases cannot statistically be distinguished at the 2σ level. The order of events is clear; but their pace and timing are much more rapid than might have been anticipated. Furthermore, there is the suggestion within this series of dates that the closed chamber and the two passage graves were contemporary, or at the very least followed each other very closely in time.

It is issues of timing and pace, and the fruitful combination of chronology and typology, that I wish to address in the remainder of this paper. To anticipate, there is suggestive evidence from a number of regions that particular monument forms were built in the course of brief intervals of time that have some of the character of historical events. This suggests that megalithic and other Neolithic monuments may only have been typical or characteristic of certain regions in the sense that they survived as visible monuments from earlier times, not as a continuous practice of construction. More provocatively, it obliges us to consider what were the specific social and cultural circumstances in which 'bursts' of monument building could have been generated. And furthermore, it injects a crucial historical perspective of short-term and sometimes sudden change into the long-term perspectives of prehistory.

Dating evidence from two regions has been chosen through which to explore these issues more fully: northern Europe, and western Iberia. In both cases, the radiocarbon dates used are those available in existing publications, and the reader is referred to those publications for fuller details of the samples, materials and contexts. To repeat an analysis of the kind undertaken for the southern British long mounds in these other regions would be an enormous task requiring a sifting of all previous radiocarbon dates and the commissioning of many new ones. That is not my aim in the present context. What I wish to show is that the published data, critically considered in the light of the recent British study, suggests that the same pattern may be repeated in numerous regions and that there is therefore scope for repeating that kind of exercise in all those areas of northern and western Europe where megalithic monuments occur.

Towards precision

The megalithic graves of Northern Europe have a prominent place in this discussion on three specific grounds: striking regularity of form; precision radiocarbon dating; and abundance.

The megalithic tombs of this region are divided conventionally into two groups, dolmens and passage graves. The former are typically modest-sized rectangular or polygonal chambers constructed of four to six uprights covered by a capstone (Midgley 2008:56). In northern Germany, dolmens have been further subdivided into *Urdolmen*, *erweiterten Dolmen*, and *Grossdolmen*: the *Urdolmen* usually consisting of a small closed chamber, or one where the entrance is merely a gap in the chamber wall; the *erweiterte Dolmen* with additional pairs of stones lengthening the chamber, one pair frequently framing the entrance or forming a short passage; and the *Grossdolmen* distinguished by its size and by the number of orthostats, but having the

same variety of entrance arrangements as the *erweiterte Dolmen* (Sprockhoff 1938:3-29; Schuldt 1972:22-24). Some of the 'great dolmens' have long passages: 4.4m long at Brejninggård, or 3m at Vedsted (Midgley 2008:63). In any other region of Europe these would be described as passage graves, but in northern Europe that term is reserved for a different category of tomb. The passages of *erweiterte Dolmen* or *Grossdolmen* are set on the long axis of the chamber; the 'true' northern passage grave (*Ganggrab*) by contrast has a passage leading from the middle of one side of an elongated chamber, with passage and chamber together creating a T-shaped plan (Fig. 1).

The striking feature of these T-shaped passage graves is the regularity of design that so many of them display. Chambers are generally rectangular in form, though sometimes with bowed side walls that can result in an oval ground plan. Most are 8 to 10m long and 2 to 2.5m wide, with 8 or 10 pairs of orthostats supporting 6 or 7 capstones (Hansen 1993:21; Midgley 2008:74). Passages may be 8m or in exceptional cases as much as 16m long. These monuments express a powerful sense of identity and design, with carefully laid dry-stonework closing the gaps between the irregular outlines of the split erratic boulders that supply the orthostats. The careful conception and execution of the building project has been demonstrated by recent excavation and consolidation at a number of Danish passage graves, including Kong Svends Høj, Jordehøj and Birkehøj (Dehn et al. 1995, 2000, 2004). Crushed flint was packed against the outside of the chamber and overlaid by clay or loam to provide an impervious layer. Overlapping flat slabs were sometimes laid over the capstones to further ensure that the chamber interior remained dry (Dehn and Hansen 2007). While the notion of specialist builders or architects may be anachronistic, it is clear that these passage graves were built to a very tightly defined and closely observed format.

It is striking to note that while some tombs show evidence of contemporary repairs, carefully undertaken to maintain the structural integrity of the tomb, such concern was entirely absent only a few centuries later at sites such as Maglehøj where the chamber was broken into during the Late Neolithic for the insertion of new burials (Dehn 2009).

The T-shaped passage graves are remarkable not only for their regularity of design and sophisticated construction but also for their abundance. Systematic surveys conducted by the Danish National Museum since the 19th century have recorded the locations of 7287 megalithic tombs, 2,364 of which are represented by surviving remains (Ebbesen 1985, Table 3). The majority of these will have been dolmens of various kinds, with passage graves making up only some 20 per cent of the total. The figures, however, constitute only a fraction of the original number of tombs. Klaus Ebbesen, from a variety of sources, estimates that they represent only 10 per cent of the original total, and that the original number of Danish megalithic tombs may have been around 25,000 (Ebbesen 1985:39-40, 54). Were we to add those of northern Germany and Sweden, the overall figure may have been in excess of 40,000 (Midgley 2008:31). These are remarkable densities of megalithic tombs, higher than in any other area of Europe.

If we accept the figure of 40,000 tombs and the proposal that around 20 per cent of these were passage graves, a total of some 8000 passage graves must once have existed in northern Europe. Dolmens and passage graves together date to the middle or later part of the 4th millennium BC, and the numbers indicate that (even if each tomb required only a few weeks or months to build), in any one year 100 or more may have been under construction. The chronology can indeed be refined even more closely. Radiocarbon dates suggest that the construction of passage graves began

relatively abruptly around 3400/3300 BC (Persson and Sjögren 1995; Fig. 2). Dolmens may have preceded passage graves by a century or so, although the evidence for this is not entirely conclusive (Persson and Sjögren 1995:74).

The duration of the period during which these tombs were constructed is difficult to establish from the radiocarbon evidence alone, since passage graves by their very nature remained open for deposition and reuse. The pattern of radiocarbon dates for human remains in the Swedish passage grave of Rössberga illustrates this well, with an initial concentration of dates around 3300 BC followed by a long tail suggesting continued deposition down to the middle of the 3rd millennium BC, and discrete episodes of reuse around 2000 BC, 1200 BC, and in the middle centuries of the 1st millennium BC (Persson and Sjögren 1995, 67). Conversely, the dates for what is stratigraphically the earliest burial at the Gökhem 17 passage grave (average of two dates 4750±100 BP; 2σ range 3763-3140 cal BC; 98 per cent of variance 3716-3337 BC) may suggest a slightly earlier origin for passage graves (Persson and Sjögren 1995), although it might be explicable in other ways.

The uncertainty introduced by the Gökhem date, and by the long tail of dates from Rössberga and other sites, is to some extent counterbalanced by a series of recent dates for Danish passage graves. The majority of radiocarbon dates for megalithic tombs are for material beneath or within them, and direct dating of the structure itself is rarely possible. A rare exception is provided by Danish passage graves in which folded layers of birch bark were laid between the courses of dry stonework. Owing to favourable preservation conditions, such birch bark has occasionally survived, and is known from ten passage graves in northern Jutland and across the island of Zealand (Dehn and Hansen 2006). With one exception, the 2σ age ranges fall consistently in

the period 3500-2900 cal BC, five of the eight sites clustering more specifically between 3300 and 2900 BC (Dehn and Hansen 2006; Fig. 3). There is indeed no significant difference between the dates from these five sites, and they in turn overlap statistically with the dates from the other three. If they are representative of the chronology of passage grave construction as a whole, they suggest that most of the estimated 8000 passage graves were built as a horizon event spanning only a few generations beginning around 3300 BC. Such a conclusion would of course be entirely consistent with the regularity in plan and construction that these monuments display. They suggest the development of a set of techniques and practices that were passed down from person to person over a century or so, which involved specialist knowledge, and which may be visualised as a veritable frenzy of megalithic-building, especially since many of the 30,000+ dolmens were probably constructed during the same period.

The north European evidence provides a model of megalithic tomb construction that explains typological and constructional similarity in terms of proximity in date. The tombs are similar in design because they were built at around the same time. To that extent, it may be considered to support the traditional typological approach that equates morphology with chronology. Before considering the broader implications of such a model, however, we must explore whether it might apply to other regions.

Dating, decoration and design

The second case-study is taken from Iberia, the southern province of the Atlantic megalith distribution. Throughout much of the peninsula, tomb chronologies remain ill-defined, but two adjacent areas of northern Iberia, Cantabria and Galicia, have provided evidence that is consistent with event-type sequences.

In Cantabrian Spain some 1250 megalithic monuments have been recorded, the majority of them tombs. They can be divided into a number of types: small closed chambers, chambers opening to the east (without passage), and chambers with an entrance portal or vestibule (Arias et al. 2006). This typological variability, coupled with the wide chronological attribution of the grave goods, made it reasonable to suppose that these megalithic tombs had been constructed over a lengthy period of time from the Neolithic to the Early Bronze Age. The 40 available radiocarbon dates, however, form a tightly clustered pattern with a major concentration in the century 4000-3900 cal BC. Statistically, 50 per cent of the probability of the median for these dates falls in the period 4082-3827 cal BC (Arias et al. 2006:19). Hence the variability in typology does not correspond to a sequence of chronological change. On the contrary, it is possible that most of the megalithic monuments of this region, whatever their morphology, were built within a very short period. The associated artefactual material provides a poor indication of construction date and includes Beaker pottery, battle axes and metal objects of the 3rd or early 2nd millennium BC; a small tail of calibrated C14 ages (at 2σ) probably corresponds likewise to the later reuse of these burial chambers.

It should be remarked that the Cantabrian dates are not without their problems, and most of them would not individually sustain critical scrutiny. In the absence of preserved human remains in this region of acidic soils, many of them are on charcoal, and some relate to buried soil horizons (Arias et al. 2006:21). As a pattern, however, they are suggestive.

The Galician and north Portuguese monuments present a still wider range of morphologies, and in this case there is indeed evidence for a chronological succession

of monument forms. The two types that concern us here are closed megalithic chambers or pit graves covered by a mound; and passage graves. The former correspond approximately to those of neighbouring Cantabria, and fall within a similar (albeit less tightly constrained) chronological bracket, concentrated within the two centuries 4000-3700 BC (4000-3800 BC for northern Portugal, 3900-3700 BC for Galicia) (Alonso and Bello 1997:511). The dates for passage graves overlap with those for closed chambers, with an initial concentration in the period 3800-3700 BC (Fig. 4). There is then a spread or tail of passage grave dates extending into the late 3rd millennium, but given the open and reusable character of these monuments, the later dates correspond most likely to later interments rather than to initial construction.

This interpretation can be supported on two grounds. First, there is the detailed sequence from the Dombate passage grave, for which a series of 13 radiocarbon dates was obtained (Alonso and Bello 1997). The moment of construction itself is indicated by two dates: 3789-3637 cal BC from the surface of the palaeosoil and 3940-3630 cal BC for a layer of charcoal on the chamber floor. Later dates in the sequence relate to the laying out of the forecourt (c.3100-3030 cal BC), the blocking of the passage (2817-2691 cal BC), and a later intrusion probably associated with the deposition of Beaker pottery (Alonso and Bello 1997:512-513).

Secondly, these patterns may be compared with the results of direct C14 dating of painted decoration in megalithic tombs from Galicia and northern Portugal. Of the ten available dates, two have large standard deviations (> ±100) and another two, from the monument of Coto dos Mouros, gave contradictory results. The remaining six dates fall within the range 4340-3980 cal BC to 3650-3300 cal BC, the four central dates clustering tightly around 3900-3700 cal BC (Steelman et al. 2005: table 1;

Carrera and Fabregas 2006:53; Fig. 5). Two of the sites are classic passage graves (Pedra da Moura 3960-3640 cal BC; Forno dos Mouros 3800-3620 cal BC), and furthermore are only 1km distant from each other. It is of course possible that the painted decoration was added after the construction of the tombs. At Monte dos Marxos, indeed, two successive layers of painted motifs were dated to 4340-3980 cal BC and 3810-3630 cal BC, implying a gap of perhaps two centuries or more between the two episodes. At Antelas, the date for the painted decoration (4655±65 BP) has been said to indicate a "temporal lag" after the construction of the chamber (5070±65 BP) (Steelman et al. 2005:387), though the latter is in fact one of a series of five dates on charcoal from the buried soil that are stated elsewhere to be "stratigraphically earlier than the construction of the monument" (Hedges et al. 1998:447).

More significantly it should be noted that the dates for the painted decoration of these tombs agree closely with the dates cited above that bracket the construction of the Dombate passage grave. Hence the overall pattern is consistent with the view that in most cases decoration occurred at approximately the same time as primary construction (Steelman et al. 2005:386). The evidence once again supports the conclusion that many, if not all, of the passage graves of Galicia and northern Portugal were built within a relatively short period of no more than two or three centuries around 3800-3500 BC (Fig. 5). Even this chronology is relatively imprecise, however, and the reality may be that these passage graves were built and decorated within the space of only a few generations.

In other regions of Iberia, the available radiocarbon dates do not yet allow a similar level of chronological precision. It might be suggested on morphological grounds, however, that certain groups of tombs are so internally consistent in construction and design that, by analogy with the Scandinavian T-shaped passage graves, we might

expect them to have been the work of a small number of successive generations. Two sets of tombs in particular might be considered.

First are the passage graves of southern and central Portugal and adjacent regions of Spain, which typically have seven or eight orthostats forming a polygonal chamber. The tombs are distinctive in plan, technique and appearance, the orthostats positioned so as lean inwards, their edges overlapping and resting against each other in a 'house of cards' manner to provide structural integrity. There is a cluster of around 500 such 'antas' in the central Alentejo (concelhos of Evora (139), Reguengos (134) and Pavia (136): Rocha 2003).

These monuments have proved difficult to date, although there is evidence to suggest that the large passage graves were built during the middle centuries of the 4th millennium BC (Calado 2006:82). Victor Gonçalves associates these megalithic tombs of orthostatic construction with small 4th millennium settlements, although the available C14 dates for burials (human skeletal material) at Cebolinhos 2 and Santa Margarida 3 fall within the later 3rd millennium and have been attributed to reuse (Gonçalves 2006:490). What is most striking about the Alentejan antas in the present context is their regularity and consistency of design. That becomes particularly pronounced in the Evora region of Alentejo (Portugal), where many of the tombs have precisely seven orthostats forming their polygonal chambers (Fig. 6). Such regularity of plan might indicate a tightly prescribed tradition of construction persisting over several centuries. Alternatively, however, they may correspond to a single short-lived horizon of construction lasting only a century or two.

Similar observations could be applied to the so-called 'tholos' tombs of southern Iberia. These extend geographically from Los Millares in Alméria in the southeast to

Alcalar in the Portuguese Algarve. The tholos tombs differ from earlier Iberian chambered tombs in a number of respects, but above all in the method of their construction that employs predominantly dry-stonework instead of megalithic blocks. They consist typically of a long passage leading to a tall corbel-vaulted chamber. The chambers contain collective inhumations that can comprise from small numbers to over 100 individuals (García Sanjuán 2006).

The presence of copper artefacts in tholos tombs has been recognised since the excavations conducted by the Siret brothers in the late 19th century and supports a relatively late position within the Iberian chambered tomb sequence as a whole. This is confirmed by the radiocarbon dates that are available. The earliest dates are from tholos tombs in southeast Spain, notably at Los Millares (tomb 19), and El Barranquete (tomb 7), consistent with construction in the last century of the 4th or the first two centuries of the 3rd millennium BC. Later dates from tholos tombs span a wide time-range including three dates in the mid-3rd millennium BC (La Pijotilla tombs 1 and 3, Huerta Montero), and a series of much later dates from the late 2nd and early 1st millennium BC (La Encantada 1, Palacio III, El Barranquete tomb 11) (García Sanjuán 2006: table 11.4). The latest dates are clearly attributable to episodes of reuse; the date from Palacio III indeed relates not to the tholos tomb chamber but to a cremation deposit in a pit covered by a separate small cairn to the northwest of the tholos tomb (García Sanjuán and Wheatley 2006).

Given the accessibility of the tomb chambers and the practice of multiple inhumation, the best guide to the date of construction is provided by the early dates of 3100-2900 BC. García Sanjuán suggests that the earliest tholoi are to be dated to this period (García Sanjuán 2006: table 11.4). The strong similarities in design and construction might however be taken to suggest that the whole category to tholos tombs was built

within the space of only a few generations, with the 'tail' of radiocarbon dates corresponding to continued use (mid-3rd millennium dates) followed by occasional reuse in the late 2nd or early 1st millennium BC. Hence here again the overall spread of dates obscures what on grounds of close structural similarity might better be interpreted as a brief horizon of tholos tomb construction around the turn of the 4th/3rd millennium BC.

Conclusion

Chronology remains a problematic issue where megalithic monuments are concerned. Direct dating of the structures themselves is rarely possible. Few sites offer any opportunity for direct AMS dating in the manner afforded by the folded layers of birch bark in Danish passage graves. The painted motifs in Iberian tombs provide only a *terminus ante quem* for the surfaces on which they were applied. Future advances in luminescence dating may ultimately present an alternative approach. Direct luminescence dating of granite surfaces has been applied with some measure of success to at least one Swedish megalithic tomb (Vafiadou et al. 2007), but the precision of luminescence determinations remains poor by comparison with AMS radiocarbon dates.

If we are unable accurately and precisely to date many megalithic tombs, recent applications of precision AMS dating to closely contextualised samples nonetheless begin to suggest new patterns in the chronology of their construction. Some 40 years ago, Richard Atkinson calculated (from the data then available) the probable number of burials in the Neolithic burial chambers of southern Britain and their relationship to population size. He concluded that those buried individuals must represent only a fraction of the total population (Atkinson 1968). That conclusion is emphatically

reinforced by dating evidence which now places the construction and principal use of those tombs within a period of two or three centuries in the mid 4th millennium BC rather than spread out across the whole of the 1000-year period that Atkinson envisaged. Most Neolithic inhabitants of southern Britain could clearly never have been buried in such monuments, since the limited period during which they were built and used represents only a fraction of the Neolithic period.

Can we extend that conclusion more generally, and propose that the Neolithic chambered tombs of Western Europe were generally built within short bursts of activity, followed by periods during which no new tombs were built (although existing tombs might continue to be used or be reused)? The evidence I have presented above is suggestive, although it does not conclusively demonstrate that such was everywhere the case. To establish that, a systematic sifting of all the radiocarbon dates in each region would be required, along with the commissioning of many new dates. That is a substantial undertaking far beyond the scope of the present paper, which simply seeks to highlight potential patterns among the existing published data. If correct, however, it suggests that when better evidence becomes available the vagueness of current megalithic chronologies might in many regions be reduced to a series of short horizons or events, each of which could be explored in terms of social practice, mortuary beliefs and interregional connections.

It also obliges us to reconsider the centrality sometimes accorded to chambered tombs and other monument types in traditional accounts of some regional Neolithic sequences. The construction of these monuments left an enduring mark upon the landscape and it is likely that earlier monuments framed the activities and beliefs of later generations (Barrett 1999). The active construction of monuments may not always have been the gradual process that is assumed, however, and a more detailed

and secure chronology might show for a region such as Brittany, for example, that the building of monuments fell within a limited number of tightly defined phases. The decorated menhirs, the passage graves, and the *allées couvertes* may each have been the work of a few generations of builders. The event-like character of these building processes may become clearer still if we are able more confidently to separate primary interments from continuing deposition in cases where human remains are present. The currently proposed time-bracket of 4200-3900 BC for passage graves in northern and western France is based largely on C14 dates for human remains which are essentially *termini ante quos* (see e.g. Dron et al. 2003)

One attraction of this proposal (speculative though it is) is the constructive combination of typology and absolute dating, and the potential it may offer of extracting 'events' from the palimpsest of often poorly dated archaeological evidence. Such 'events' themselves must be problematic in certain regards (Lucas 2008). Envisaging prehistoric sequences within the time frame of human life spans or short sequences of successive generations does, however, enable us to consider processes of construction and innovation at a human scale (Whittle et al. 2008, 68). It also enables us to replace the image of a venerable and enduring Atlantic monument tradition with a more dynamic vision of real events and punctuated change.

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Biographical Note

Chris Scarre is a specialist in the prehistory of Western Europe and has directed excavations at Neolithic sites in France, Portugal and the Channel Islands. From 1995-2004 he co-directed excavations (with Luc Laporte and Roger Joussaume) at the Middle Neolithic long mound of Prissé-la-Charrière in western France. His most recent field project is a study of megalithic monuments and landscape on the island of Herm in the Guernsey archipelago. He was founder-editor of the *Cambridge Archaeological Journal* from 1991 to 2005, and in 2006 was appointed Professor of Archaeology at Durham. He is the editor of the leading textbook of world prehistory, *The Human Past* (2nd ed. 2009), and has recently completed a book on the Neolithic of Brittany shortly to be published by Oxford University Press.

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Captions to Figures

Figure 1. Distribution of passage graves in northern Europe and ground plan and internal elevation of Sparresminde (Møn, Denmark) (from Midgley 2008; Sparresminde diagram by A.P. Madsen 1900).

Figure 2. Calibrated radiocarbon dates for bone from Scandinavian dolmens and passage graves (redrawn from Persson and Sjögren 1995).

Figure 3. Calibrated radiocarbon dates for birch bark from Danish passage graves. Data from Dehn and Hansen 2006; calibration curve Reiner *et al.* 2009; calibration by OxCal 4.1 (Bronk Ramsey 2009).

Figure 4. Calibrated radiocarbon chronology of closed megalithic chambers (A) and passage graves (B) in Galicia and northern Portugal (redrawn from Alonso Matthías and Bello Diéguez 1997).

Figure 5. Calibrated radiocarbon dates for painted decoration in megalithic tombs of Galicia and northern Portugal; rectangle indicates key period 3800-3500 BC. Data from Steelman et al. 2005; calibration by OxCal 4.1 (Bronk Ramsey 2009).

Figure 6. Central Alentejan passage graves with chambers of seven orthostats: A Anta 1 da Herdade da Colmieira; B Anta 1 da Herdade do Paço das Vinhas; C Anta da Aldeia da Mata; D Anta 1 da Herdade do Silval (redrawn from Santos 1994).

Titre

Les pierres des âges: tempo et chronologie des monuments mégalithiques

Résumé

La chronologie constitue toujours un sujet problématique pour l'archéologie préhistorique, cependant les progrès dans les datations radiométriques au niveau de leur précision de plus en plus haute nous permettent aujourd'hui de percevoir des régularités jusqu'à l'echelle de la durée de vie individuelle. L'étude des monuments mégalithiques a beaucoup profité de ce progrès scientifique mais elle se trouve toujours freinée par le caractère indirect du rapport entre les matériaux qui sont datés et les structures mégalithiques elles-mêmes. La considération de quelques séquences de la France, des pays scandinaves, et de la péninsule ibérique nous amènent à proposer que les datations maintenant disponibles laissent apparaître l'hypothèse selon laquelle la construction de monuments mégalithiques suivait un rythme non régulier, avec beaucoup de monuments construits pendant des périodes chronologiques assez reduites. Cette constatation apportera des implications

significatives pour les séquences typologiques ainsi que pour le contexte social dans lequel des monuments ont été conçus et materialisés.

Mots-clés: datations AMS, chronologie, monuments mégalithiques, Néolithique, tombes à couloir, typologie