

Cromlechs, Chronology and Chromosomes: New Light on Sligo's Megaliths

Göran Burenhult

Abstract:

The megaliths of the Knocknarea Peninsula are among the oldest in Ireland, but the earliest dates claimed for the monuments remain contested. This paper revisits the issue of megalithic construction and use in light of recent radiocarbon and genetic analyses. It presents a new overview of megalithic chronology and discusses the implications of recent research for the interpretation of the Knocknarea Peninsula monuments.

1. Introduction

The megalithic monuments of the Knocknarea Peninsula have long captured the imagination of Sligonians and visitors alike. Up until the 1970s these Stone Age structures, sometimes referred to in earlier literature as cromlechs, were thought to be simpler and younger representatives of a monumental tradition originating in the Boyne Valley. However, large-scale excavations in the late 20th century revealed that the tombs at Carrowmore, in the very centre of the peninsula, were among the earliest in all of Ireland, and the history of Irish megaliths had to be rewritten. In fact, some of the datings obtained from the tombs were so early that a case was made by this author for megalithic activity in the west of Ireland before the arrival of farming. An intense debate followed, and the earliest dates from Carrowmore remain contested. No major excavations have been carried out in the peninsula since 1998, but in recent years the monuments have experienced renewed scientific interest in the form of secondary analyses of materials unearthed during the earlier excavations, including new efforts of radiocarbon dating, as well as genetic sequencing of buried individuals.

With a focus on Carrowmore and Primrose Grange, this short paper revisits the Peninsula megaliths. It briefly reviews the research carried out to date, and it presents a new chronological overview of the emergence and development of these monuments in light of recent research.

1.1. The dating controversy

The archaeological investigation of Carrowmore carried out 1977-1982 produced a number of finds which strongly contradicted the prevalent view of the development of megalithic practices in Ireland. A series of radiocarbon dates from what was interpreted to be construction layers placed Carrowmore among the very earliest megalithic sites in western Europe – around 4,500-3,800 BC – and reversed the accepted developmental sequence of the Irish passage tomb tradition (Burenhult 1980a; 1980b). Furthermore, the early dates suggested an origin of megalithic practices in the Mesolithic period, since local populations were thought to still have been hunter-gatherers around that time. This was at odds with the established wisdom at the time, which held that megaliths were a firmly Neolithic phenomenon, arriving with the first farming communities to the Boyne Valley around 3,200 BC (Murray 1970; Smith *et al.* 1971; Smith 1974).



Fig. 1: The tomb at Primrose Grange before excavation in 1995 with the Knocknarea Mountain slopes in the background. Photo: Göran Burenhult.

material which had already been dead for perhaps hundreds of years at the time of the construction of the monuments, e.g., from large trees like oak (see e.g., Caulfield 1983; Bergh 1995). However, this potential phenomenon was known and considered in the selection of charcoal samples for radiocarbon dating all along (Burenhult 1977; 1978; 1979; 2009, 12). Wooden anatomical analyses were conducted on the samples, which involved remains of small branches and grains, and revealed a predominance of hazel (*Corylus avellana*), hawthorn (*Pomoideae*), and mountain ash (*Sorbus aucuparia*).

The second phase of excavations at Carrowmore 1994-1998, and concurrent excavations of a court-tomb at Primrose Grange (Figs. 1 and 2), two km west of Carrowmore, produced a new series of radiocarbon dates from eight tombs (Burenhult 1996; 1997; 1998; 2009). Similarly interpreted as originating in construction layers, these samples dovetailed the previous ones chronologically and suggested a date of primary megalithic activity between c. 4,200 and 3,900 BC.

However, the early dates of the monuments on the Knocknarea Peninsula remain contested and have not gained widespread acceptance. For example, Bergh & Hensey (2013) offer a critique of the notion of constructional dating and argue for a thorough chronological analysis of tomb use instead. They do so on the basis of an unparalleled series of new radiocarbon dates on 25 pieces of burnt antler pins, a prominent type of artefact in the Carrowmore tombs, unearthed from two tombs in the previous excavations.

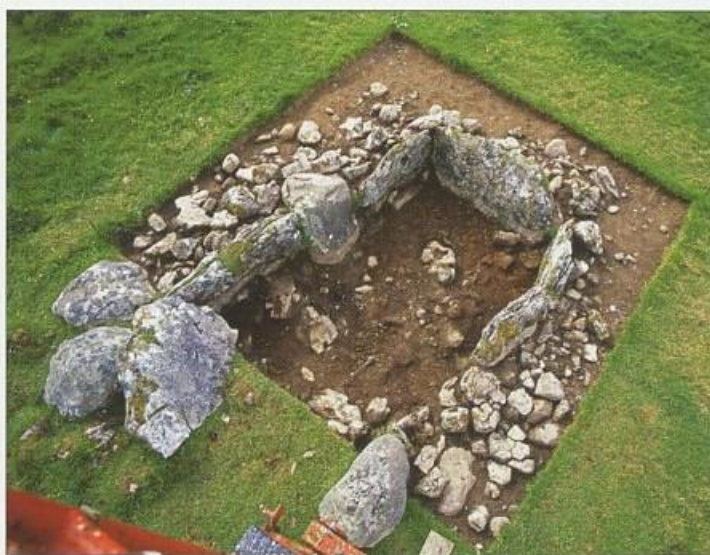


Fig. 2: The tomb at Primrose Grange during the excavation in 1996. Photo: Göran Burenhult.

These pins represent depositions inside completed tombs, that is, they were found in positions where cremation burials and other activities took place during a substantial period of time, or, in some cases, in layers damaged by more recent activities. The radiocarbon datings of the antler pins provide a time span of *c.* 3,750-3,200 BC, whose start coincides with what the authors accept as the earliest conclusive evidence of megalithic activity, a standpoint echoed most recently by Stolze (2019, 32).

The Bergh & Hensey 2013 study lays bare fundamental conceptual differences in approaches to megalithic dating. Much of the previous discussion had focused on the age of the monuments, whereas Bergh & Hensey introduce an emphasis on tomb use. Their exhaustive targeting of a particular category of significant artefacts (antler pins) produces a comprehensive and fine-grained chronology of an aspect of tomb use, but it is of limited help in determining when the monuments were initially constructed. Indeed, Bergh & Hensey (2013, 360) dismiss a one-sided pursuit of construction dates based on charcoal and exclude them on the grounds that they are inevitably contestable.

In a recent reanalysis and reappraisal of legacy documentation of a megalithic tomb at Baltinglass Hill in Co. Wicklow, Schulting *et al.* (2017) demonstrate the complexity of dating phases of construction, reconstruction, and use of this Irish megalith, built *c.* 3,900 BC and used continuously for approximately 1,000 years. As new burials were deposited, earlier materials were often pushed aside or removed from the chamber. At Carrowmore, similarly, burials from the late Neolithic, Bronze Age and even Iron Age periods have been documented inside the tombs (Burenhult 1980a; 1980b), and the central monument Listoghil, Tomb 51 (Figs. 3 and 4) in particular provides ample evidence of fundamental remodelling (Burenhult 1996; 1997; 1998; 2009, 23-27). Consequently, what is found inside the chambers rarely, or never, dates the primary construction of the tomb. In this respect, a particular artefact category is unlikely to offer conclusive evidence of the age of the monuments. Schulting (2014) shows an equivalent sequence of construction and use of the famous Poul nabrone portal tomb in Co. Clare, 3,900-3,120 BC.

While the Carrowmore dating controversy has continued, a growing number of megalithic monuments in other parts of western Europe has been shown to be of similar or greater antiquity, such as tombs in Brittany and the Iberian Peninsula dated to 4,800-4,300 BC (Joussaume 1988; Arias & Fano 2003; Oosterbeek 2003; Scarre 2003).

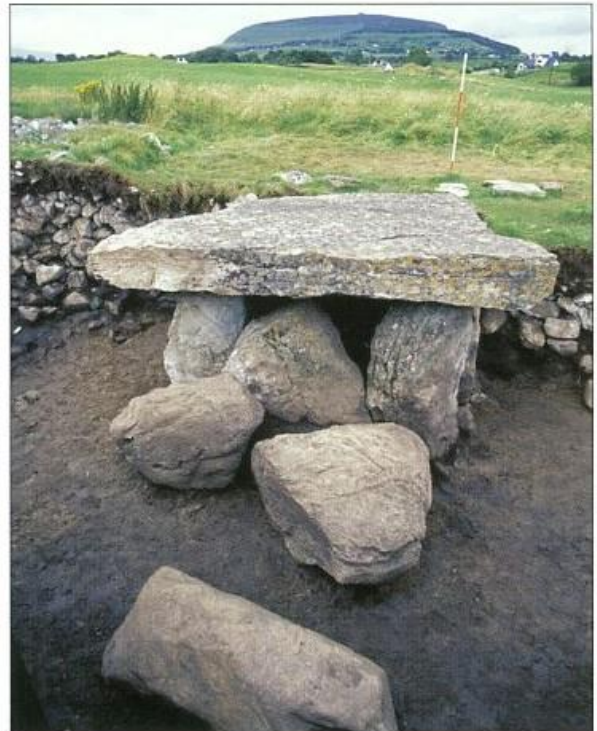


Fig. 3: The central chamber of Tomb 51, Listoghil, during excavation in 1996 with Knocknarea Mountain in the background.

At the time of the construction of the central chamber, three large boulders were left outside the chamber, most likely the remains of an earlier megalithic monument at the site, predating the larger monument.

Photo: Göran Burenhult.



Fig. 4: An intact stone-packing was found at the southern kerbstone, outside the boulder circle of Tomb 51. This stone-packing was dated to c. 4,100 BC. It is likely to be the remains of earlier megalithic activity, and may have formed part of the same structure as the three displaced boulders near the central chamber to be seen in Fig. 3. Photo: Göran Burenhult.

1.2. Ancient DNA

A recent genetic study by Sánchez-Quinto *et al.* (2019) regenerated and explored genome sequence data from human remains from a number of megalithic tombs in Europe, including eleven individuals from Primrose Grange and one from the central Carrowmore monument Listoghil, Tomb No. 51. These unburnt skeletal samples were also radiocarbon dated and provided dates between c. 3,800 and 3,400 BC.

Significantly more males than females were buried, at Primrose Grange nine of eleven analyzed individuals. The genetic data show close kin relations among the individuals buried and also a paternal continuity through time,

suggesting the monuments were associated with patrilineal kindred groups. However, the fact that three of five kinship relations involve females indicate that female kindred members were not excluded. There is reason to believe that specific family groups used these monuments for burial and other funerary practices. A likely first-degree kin relation, possibly father and son, was shown to exist between two contemporary men buried at Primrose Grange and Tomb 51.

The study showed that the individuals had genomes of a type associated with Neolithic “farmers” but it also observed a partial admixture component with Mesolithic “hunter-gatherers”, and the samples show an ancestry related to populations along the Atlantic coast. The identified paternal (Y-DNA) lineages of the male individuals belong to haplogroup I2a2, associated with deep Western European Mesolithic ancestry.

Another recent DNA study by Kador *et al.* (2018) of skeletal materials from the Carrowkeel passage tombs in the Bricklieve Mountains suggests interesting differences between this complex of monuments and that of Knocknarea. The DNA sequencing of six Carrowkeel individuals demonstrated genetic ancestry of Irish Neolithic populations but with a broader demographic range than that observed in the Knocknarea Peninsula samples, with all groups from infants to older adults, both males and females, represented, and with little evidence of close kinship relations between them. As the authors suggest, this may highlight that family groupings were unlikely to have been the basis of selection for placements in the tombs at Carrowkeel (Kador *et al.* 2018, 25). Radiocarbon datings of the bones and associated materials suggest a main period of use between 3,600 and 3,200 BC, which partly overlaps with the Carrowmore and Primrose Grange individuals.

1.3. The Neolithic arrival: new evidence

Our knowledge of the arrival of farming in Ireland has taken great leaps since the controversial Carrowmore radiocarbon dates first emerged in the late 1970s. At that time, the Neolithic period was considered to have begun around 3,400 BC, with a single Neolithic date from Ballynagilly, Co. Tyrone, *c.* 3,700 BC (Smith *et al.* 1971; Smith & Collins 1971). However, current evidence suggests that the first signs of Neolithic phenomena, in the form of crops and domesticated cattle, had appeared already around 4,000 BC, and that within a few centuries wheat and barley were systematically cultivated in a number of locations (McClatchie *et al.* 2019).

2. The Knocknarea Peninsula datings systematized

The recent dating sequences of Bergh & Hensey 2013 and Sánchez-Quinto *et al.* 2019, in combination with the datings obtained during the excavation campaigns of the late 20th century (Burenhult 1996; 1997; 1998; 2009, 10-11), make up an unparalleled chronological documentation of megaliths in Ireland. This section provides a first presentation and assessment of the combined data, with the aim to further elucidate the chronological origin and development of the Knocknarea Peninsula tombs. All available radiocarbon samples from Carrowmore and Primrose Grange with dates earlier than 3,000 BC are included, a total of 79 samples. An outlier sample dated to *c.* 5,450 BC from Carrowmore Tomb No. 4 is excluded due to its chronological isolation. The data are organized according to two principles: a division of radiocarbon dated samples into four different categories aimed at distinguishing between datings of tomb construction and datings of tomb use (described in Section 2.1), and systematization of the data on a tomb-by-tomb basis in order to facilitate chronological comparison across monuments (Section 2.2). The resulting chronology is described in Section 2.3 and the data are visualized in Table 1.

2.1. Categories of dated samples

Previous assessments of dated samples have tended to either analyze all of the samples in question as a single group (see e.g., Burenhult 2001, 58; 2009, 14), or explicitly single out only one particular category of samples for analysis (Bergh & Hensey 2013). By contrast, the overview presented here distinguishes four categories of radiocarbon dated samples with the aim of foregrounding the unresolved issue of the age of the construction of monuments as well as the sometimes overlooked but significant distinction between construction and use. These categories comprise (1) charcoal from fundamental and likely primary constructional activities, (2) charcoal from significant activities of tomb use which cannot be concluded to be associated with primary tomb construction, (3) burnt antler pins from the study of Bergh & Hensey (2013), and (4) human skeletal materials representing likely burials, including both cremated and uncremated bones (most of the latter from the recent study of Sánchez-Quinto *et al.* 2019). Only the first category is hypothesized to potentially date the actual initial construction of a tomb (in line with Burenhult 1980a; 1980b; 2003, 66-69), whereas the remaining three are likely to be associated with activities of use of the completed tomb. The four categories are explained in more detail below (Sections 2.1.1-2.1.4).

2.1.1. Charcoal in Context Type I, charcoal from fundamental and likely primary constructional activities.

Dated samples of Context Type I are charcoal samples determined to have been deposited in connection with fundamental constructional activities likely associated with the initial construction of the monument. This includes samples documented in closed layers in the form of (1) fundamentals of orthostats, either in tomb chambers or boulder circles, (2) intact stone packings inside boulder circles, (3) pits and postholes determined to form part of early construction phases, and (4) burnt layers interpreted as resulting from pre-constructional cleansing of a site with fire. Twenty such samples have been identified and included in this overview.

2.1.2. Charcoal in Context Type II, charcoal from significant activities of tomb use which cannot be concluded to be associated with primary tomb construction.

Dated samples of Context Type II are charcoal samples which cannot be determined to have been deposited in connection with fundamental constructional activities, and are therefore not concluded to belong to the initial constructional phase. Nevertheless, they represent deposits associated with significant activities of tomb use and they have been documented in (1) undisturbed layers inside the tombs, or (2) constructions inside the boulder circle determined to be secondary. Seventeen such samples have been identified and included in this overview.

2.1.3. Antler pins (Bergh & Hensey 2013)

Radiocarbon dated antler pins included here comprise the full series of twenty five samples published by Bergh & Hensey 2013; all of them were excavated in the late 20th century excavation campaigns from two of the Carrowmore tombs, namely Tomb 4 and Tomb 55A; see note below on the numbering of Tomb 4.

Antler pins represent a well-contained category of typical megalithic find materials unequivocally associated with tomb use, but their context of deposit varies. Thirteen of them were documented in Tomb 4; twelve in disturbed layers in Tomb 55A. None of them was documented in the context of fundamental constructional activities as outlined for charcoal samples in Section 2.1.1 above.

2.1.4. Skeletal remains

Radiocarbon dated burnt and unburnt skeletal materials comprise eighteen tooth or bone samples from Carrowmore (6) and Primrose Grange (12). All were unearthed in the late 20th century excavation campaigns. Uncremated human remains, a necessity for DNA extraction, are scarce in the Knocknarea Peninsula tombs and the dated materials represent the majority of such remains at Carrowmore and Primrose Grange. The samples are all highly likely to be from individuals buried in the tombs and thus point to a significant aspect of tomb use. The Primrose Grange samples were documented in undisturbed deposits within the tomb, whereas the Carrowmore ones were mostly found outside tomb chambers or in disturbed layers.

¹ Petrie numbered this site as Tomb 3 in 1836. Wood-Martin (1888) has an error in the numbering on his map so it became Tomb 4 and that was what was used by Finlay Tower Kitchin and Michael Cahalane of Sligo Field Club and later throughout the Swedish Archaeological Excavation Campaign. Bergh (1995), recognising the source of the problem, reverted to Petrie's number and he and Hensey use Tomb 3. It is unfortunate that one of the more controversial tombs in Carrowmore / Ireland / Western Europe has two numbers.

2.2. Tomb-by-tomb arrangement

Previous chronologization of the Knocknarea Peninsula tombs has tended to present the radiocarbon dates and categories from all of the monuments as a group, and it has not lucidly represented dating sequences from the point of view of individual tombs (see *e.g.*, Burenhult 2009). By contrast, the overview presented here represents the data on a tomb-by-tomb basis (see Table 1). This is in order to facilitate chronological comparison of the different sample categories across the nine monuments from which there are radiocarbon dated samples.

2.3. Tomb chronology: a new overview

Table 1 plots the datings of the radiocarbon samples for each tomb according to the categories described in Sections 2.1.1-2.1.4 on the timescale. Tombs are arranged left-to-right according to their earliest dates, in descending order. Colours represent the Irish Neolithic periodicity of Whitehouse *et al.* (2018), the Early Neolithic I phase starting at *c.* 4,000 BC. Radiocarbon results involve a span of age likelihood which typically extends over a century or more. The sample symbols are placed at the midpoint of each such estimated time span. The main patterns observed in Table 1 are discussed in Section 3 below.

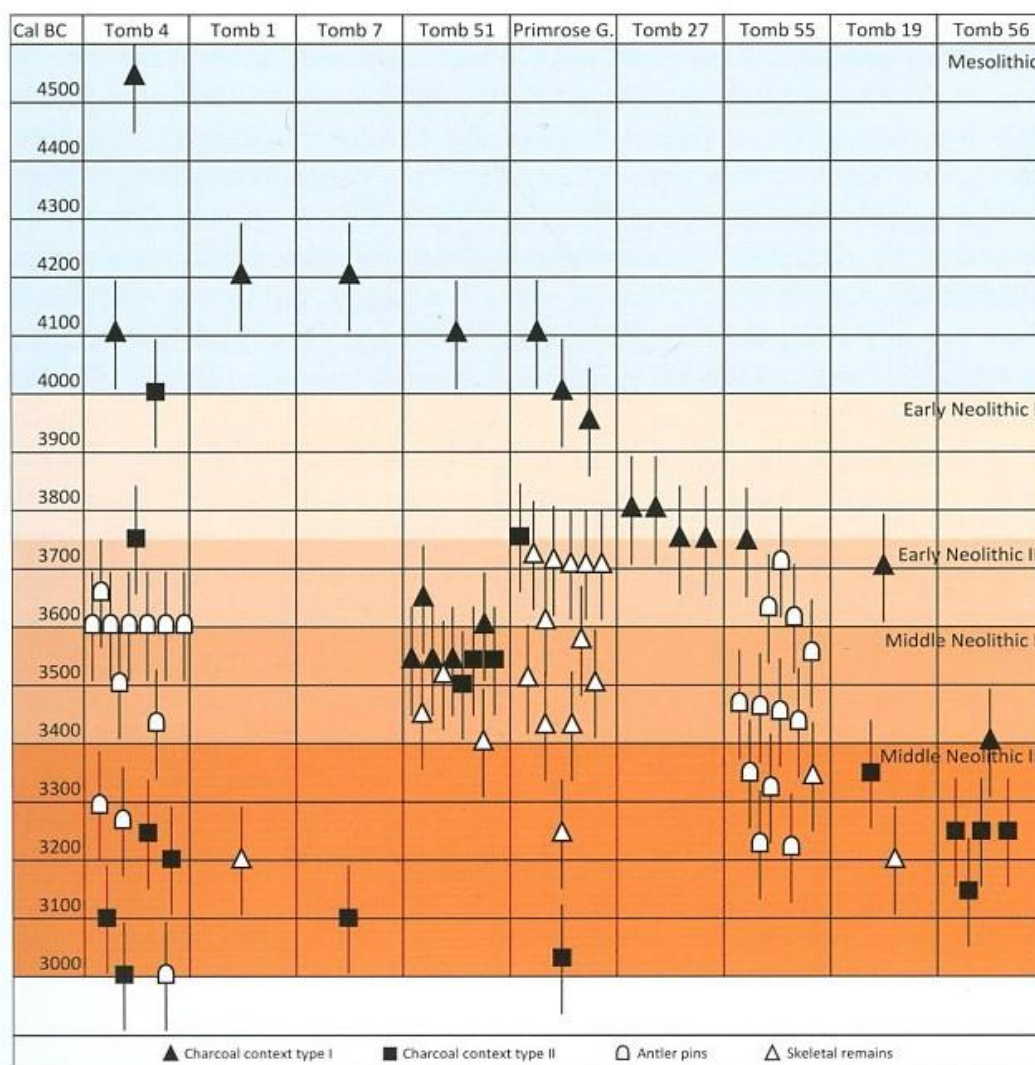


Table 1. Chronological overview of 79 radiocarbon dates from Carrowmore and Primrose Grange. Drawing: Göran Burenhult.

3. Discussion

The chronological overview presented in the previous section offers a new and wide ranging perspective on the radiocarbon dates of the Knocknarea Peninsula monuments. A few observations call for discussion.

The early charcoal samples included here are the same as the ones deemed unreliable by Bergh & Hensey (2013) for dating the initial construction of the tombs. Taken individually, these samples will remain contestable as far as their origin is concerned. However, we can observe a striking coherence when the tombs are compared. Five out of nine tombs (Tombs 1, 4, 7, 51, and Primrose Grange) have produced charcoal from Context Type I within the 4,200-4,000 BC range. This pattern calls for an explanation. Since "old wood" has been pre-empted, the most pertinent explanation for the skeptic is some form of pre-site activity, where charcoal from pre-megalithic deposits have ended up in constructional layers of the tombs by coincidence. Bergh & Hensey (2013) suggest the central interior plateau of the Knocknarea Peninsula may have attracted human activity before the megaliths were built, and that early samples originate from that period. However, the likelihood of this explanation diminishes with the increasing number of monuments shown to contain such early dates. On current evidence, this coincidental phenomenon would have to have occurred in five different monuments.

The tomb at Primrose Grange – one of the five – is significant in this context. While the other four are clustered closely together at Carrowmore, Primrose Grange is located about two kilometers to the west, on the southern slope of Knocknarea Mountain. The site can hardly be argued to be located in the same imagined locality of pre-megalithic activity as the Carrowmore tombs. Yet it has produced a comparable date of 4,100 BC. Arguably, the most parsimonious explanation is that the dated charcoal does associate with the construction of the monuments and not with pre-site activity.

This parsimony is particularly appealing in light of the currently accepted timing of the Neolithic arrival in Ireland, *c.* 4,000 BC (Whitehouse *et al.* 2018). Controversially, early megalithic activity like the one proposed here no longer needs to be explained within the context of a purely Mesolithic hunter-gatherer society (as in Burenhult 1999; 2003). Instead, it coincides with a period of dynamic transition, in the centuries preceding the first archaeologically and archaeobotanically identifiable signs of farming and animal husbandry, and on the very cusp of the Neolithic. This was undoubtedly a time of intense interaction, spread of ideas, and fusion of old and new – not an unthinkable ecology for the birth of a monumental tradition. In other favorable coastal areas of Europe, such as Denmark and southern Sweden, the late Mesolithic is similarly characterized by archaeologically visible mortuary practices. Inspiration may well have arrived along the Atlantic coast from the south: megalithic activity in Brittany and Poitou in coastal France has been established to have occurred as early as 4,800-4,700 BC, and routes of contact along the Atlantic fringe were probably already long established (Burenhult 2001; Collard *et al.* 2010; Schulz Paulsson 2017). The Knocknarea Peninsula and its monuments appear to hold a crucial key to our understanding of these dynamics.

A second observation is that the chronological overview potently highlights a period of intensified monument activity starting *c.* 3,750 BC (coinciding with the Early Neolithic II phase of Whitehouse *et al.* (2018). This involves the construction of new tombs (Tombs 19, 27, 55), the appearance of secondary structures in existing tombs (Tomb 4 and Primrose Grange), and significant activities reflected in deposited human remains as well as artefacts such as antler pins. This was also the period in which Listoghil, Tomb 51, went through a fundamental

remodelling. Here, the excavations revealed three large gneiss boulders on the east side of the current central chamber, below the intact cairn. The boulders did not form part of the chamber and were located above the construction layer of the tomb. They are likely to be the remains of an earlier megalithic structure and to have been pushed around a few times during the cleansing of the ground surface for the new structure (Burenhult 1998). Furthermore, the remains of a massive, intact stone-packing at the southern kerbstone of the boulder circle is also likely to have been part of the original structure. This is where the charcoal sample with a 4,100 BC date was documented. The constructional dates from Tomb 51 around 3,600 BC bear witness to this profound overhaul (Burenhult forthcoming).

It is also interesting to note the clear chronological parallelism of Primrose Grange and the Carrowmore cluster. A similar construction date is followed by an equally similar period of intensified use starting c. 3,750 BC. This is in spite of great morphological differences – Primrose Grange is classified as a court tomb, Carrowmore as passage tombs – and distinct mortuary practices and artefacts. Burials at Primrose Grange are inhumations, at Carrowmore they are cremations. Primrose Grange lacks the antler pins and stone and clay balls typical of Carrowmore, and instead has exquisite pieces of chert artefacts. As noted, the two sites are located only two kilometers apart. The close kinship revealed between two contemporary men buried in Carrowmore Tomb 51 and Primrose Grange c. 3,500 BC (Sánchez-Quinto *et al.* 2019, 9472) – perhaps as close as father and son – point to intriguing discrepancies between consanguineal, *i.e.*, blood, relationships and cultural relationships within a remarkably limited geographical area.

Judging from the same genetic study, a majority of the ancestry of the Knocknarea Peninsula population of this period of intensified megalithic activity was related to early Neolithic farmers, with partial admixture related to Mesolithic hunter-gatherers. The demographic dynamics and genetic identities of the preceding centuries and the initial construction phase remain unknown. It is also still unclear if the deeply Mesolithic paternal (Y-DNA, haplogroup I2a2) lineages identified in the Carrowmore and Primrose Grange men are local or arrived as part of the Neolithic package from elsewhere in Europe or mainland Britain. But it is clear that the Knocknarea Peninsula megalith users carried significant signals of Atlantic hunter-gatherer ancestry. This gives support to the idea that megalithic societies emerged in a context of contact between hunter-gatherers and farmers. In this regard, the monuments of Knocknarea Peninsula promise to have more stories to tell about this intriguing phase of Irish prehistory.

Acknowledgements: I am grateful to the editor, Martin A. Timoney, for inviting this contribution to the Sligo Field Club Journal, and to Niclas Burenhult for his conceptual and editorial input.

References

- Arias, Pablo, & Fano, Miguel, 2003: "The chronology of the earliest phases of megalithic monuments in Spain", in Burenhult, Göran, ed., 2003, 80-83.
- Bergh, Stefan, 1995: *Landscape of the Monuments, A Study of the Passage Tombs in the Cuil Irra Region, Co. Sligo, Ireland*, Stockholm, Riksantikvarieämbetet Arkeologiska Undersökningar, Skrifter Nr 6.
- Bergh, Stefan, & Hensey, Robert, 2013: "Unpicking the chronology of Carrowmore", *Oxford Journal of Archaeology*, 32:4, 343-366.
- Burenhult, Göran, 1977; 1978; 1979: *The Swedish Archaeological Excavations at Carrowmore, Co. Sligo, Ireland*. Unpublished excavation reports submitted to The Office of Public Works, Dublin.
- Burenhult, Göran, 1980a: *The Carrowmore excavations, Excavation Season 1980*, Stockholm Archaeological Reports, No. 7.
- Burenhult, Göran, 1980b: *The Archaeological Excavation at Carrowmore, Co. Sligo, Ireland. Excavation Seasons 1977-79*, Theses and Papers in North-European Archaeology 9, Stockholm.
- Burenhult, Göran, 1984: *The Archaeology of Carrowmore. Environmental Archaeology and Megalithic Tradition at Carrowmore, Co. Sligo, Ireland*, Theses and Papers in North-European Archaeology 14, Stockholm.
- Burenhult, Göran, 1994; 1995; 1996; 1997; 1998: *The Swedish Archaeological Excavations at Carrowmore, Co. Sligo*,

- Ireland, Unpublished excavation reports submitted to The Office of Public Works, Dublin.
- Burenhult, Göran, 1999: "Megalithic Symbolism in Ireland Scandinavia in light of new evidence from Carrowmore". *ARKEOS. Perspectivas em Diálogo*, 49-108.
- Burenhult, Göran, 2001: "Long-distance cultural interaction in megalithic Europe: Carrowmore and the Irish megalithic tradition in a Western European and Mediterranean context", in: Werbart, B. (ed.) *Cultural interactions in Europe and the eastern Mediterranean during the Bronze Age*. BAR International Series 985, 47-66.
- Burenhult, Göran, 2003a: "The chronology of Carrowmore", *Stones and Bones. Formal disposal of the dead in Atlantic Europe during the Mesolithic-Neolithic interface 6000-3000 BC*, BAR International Series 1201, 66-69.
- Burenhult, Göran, ed., 2003b: *Stones and Bones. Formal disposal of the dead in Atlantic Europe during the Mesolithic-Neolithic interface 6000-3000 BC*. BAR International Series 1201.
- Burenhult, Göran, 2009: *The Illustrated Guide to The Megalithic Cemetery of Carrowmore, Co. Sligo, Ireland*, 3rd revised edition. Tjornarp.
- Burenhult, Göran, (forthcoming): "Before Listoghil: multi-period megalithic sites on the Knocknarea Peninsula, Co. Sligo, Ireland".
- Collard, Mark, et al., 2010: "Radiocarbon evidence indicates that migrants introduced farming to Britain", *Journal of Archaeological Science* 37, 866-870.
- Cummings, Vicky, 2009: *A View from the West: the Neolithic of the Irish Sea Zone*. Oxford, Oxbow Books.
- Cummings, Vicky, et al. 2015: "Chambered Tombs and Passage Graves of Western and Northern Europe", in Fowler, C. et al. DOI:10.1093/oxfordhb/9780199545841.013.043
- Cummings, Vicky, & Richards, Colin, 2016: "A monumental task. Building the dolmens of Britain and Ireland. ". in Laporte, L., & Scarre, C., eds., 49-58.
- Fowler, C. et al., eds. 2015: *The Oxford Handbook of Neolithic Europe*, . DOI:10.1093/oxfordhb/9780199545841.013.043
- Hensey, Robert, and Bergh, Stefan, 2013: "'The inns at Sligo are better than those at Auray . . . and the scenery far more beautiful': Carrowmore re-visited", in Timoney, ed., 2013, 41-43.
- Joussaume, Robert, 1988: "Dolmens for the Dead: Megalith-Building throughout the World". London, Batsford.
- Kador, Thomas, et al., 2018: "Rites of Passage: Mortuary Practice, Population Dynamics, and Chronology at the Carrowkeel Passage Tomb Complex, Co. Sligo, Ireland". *Proceedings of the Prehistoric Society*. DOI: 10.1017/ppr.2018.16.
- Laporte, L. & Scarre, C., eds. *The Megalithic Architectures of Europe*, Oxford, Oxbow Books.
- McClatchie, Meriel, et al., 2019: "Food Production, Processing and Foodways in Neolithic Ireland". DOI:10.1080/14614103.2019.1615215. Article on *Researchgate*
- Murray, Jacqueline, 1970: *The First European Agriculture: a Study of the Osteological and Botanical Evidence until 2000 BC*, Edinburgh, University Press.
- Oosterbeek, Luiz, 2003: "Problems of Megalithic Chronology in Portugal", in Burenhult, G., (ed.) 2003, 83-86.
- Sanchez-Quinto, Federico, et al., 2019: "Megalithic tombs in western and northern Neolithic Europe were linked to a kindred society". *Proceedings of the National Archaeological Society*, May 7, 116:19.
- Scarre, Chris, 2003: "Radiocarbon dating and the chronology of French chambered tombs", in Burenhult, G., (ed.) 2003, 65-69.
- Schulting, Rick J., 2014: "The dating of Poul nabrone, Co. Clare", in: Lynch, Ann, ed., *Poul nabrone: An early Neolithic Portal Tomb in Ireland*. Dublin, Department of Arts, Heritage and the Gaeltacht, Archaeological Monograph Series, No. 9.
- Schulting, Rick J., et al., 2017: "Radiocarbon dating of a multi-phase passage tomb on Baltinglass Hill, Co. Wicklow". Project: *Cultivating Societies: Assessing the Evidence for Agriculture in Neolithic Ireland*. DOI: 10.2017/ppr.2017.1, *Proceedings of the Prehistoric Society*, 83, 305-323
- Schulz Paulsson, Bettina., 2017: "Time and Stone: The Emergence and Development of Megaliths and Megalithic Societies in Europe". Oxford, Archaeopress Archaeology.
- Sheridan, J. Alison, 2003a: "The chronology of Irish megalithic tombs", in Burenhult, G., ed., 2003, 69-73.
- Sheridan, J. Alison, 2003b: Ireland's earliest passage tombs: a French connection, in: Burenhult, Göran, (ed.) 2003, 9-25.
- Sheridan, J. Alison, 2004: "Neolithic connections along and across the Irish Sea". In: Cummings, V. & Fowler, c. (eds). *The Neolithic of the Irish Sea: materiality and traditions of practice*. Oxbow, Oxford.
- Sheridan, J. Alison, 2010: "The Neolithization of Britain and Ireland: The Big Picture". In: Finlayson, B. & Warren, G.M. (eds). *Landscapes in transition*. Oxbow/CBRL, Oxford.
- Smith, A.G., et al., 1971: "New radiocarbon dates from Ireland", *Antiquity* 45, 97-102.
- Smith, I.F., 1974: "The Neolithic", in *British Prehistory, a new Outline*, Edited by Colin Renfrew. London.
- Stolze, Suzanne, 2019: "Cúil Irra peninsula". In: Stolze, Susanne, (ed.) *Archaeology and landscape history of Neolithic County Sligo*. Dublin, INQUA.
- Timoney Martin A., ed., 2013: *Dedicated to Sligo, Thirty-four Essays on Sligo's Past*, Keash, Publishing Sligo's Past.
- Whitehouse, Nicki J., et al., 2018: "Prehistoric land-cover and land-use history in Ireland at 6000 BC", *Pages Magazine*, 26, 1, June 2018.

→ *PNAS, Proceedings of the National Academy of Sciences of the United States of America*