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Calendars, Feasting, Cosmology and Identities:
Later Neolithic-Early Bronze Age Ireland in European Context

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Abstract

The aim of the study is to investigate the connections between calendar systems, large-scale feasting activities, changing representations of cosmological ideas and the formation of group identities from the Middle/Late Neolithic transition to the Early Bronze Age in Ireland. Positive strides have been made in recent decades with regard to deciphering the cosmological beliefs of Bronze and Iron Age Europe. This study argues that these cosmological beliefs, indelibly linked to the daily journey of the sun, were already present during the Neolithic. There are profound associations between calendrical structures and cosmology and it is argued that the belief systems of the Neolithic-Bronze Age were framed not only with respect to the daily journey of the sun, but also referenced relationships between seasonal change and a combination of the daily and yearly solar cycles. In this context, the study also explores why the winter solstice was an important time for large communal gatherings and feasting during the Late Neolithic-Early Bronze Age in the British Isles. It investigates why the mid-winter period would have been more appropriate for large-scale aggregation, as identifiable at such sites as Durrington Walls (Wiltshire) and Newgrange (Meath), than other times of the year, emphasizing the close relationship between the "natural" and "social" cycles that would have structured the rhythms of life. Connections with underlying themes of fertility and regeneration are highlighted and the "ceremonial" importance of the winter solstice as celebrating the eternal "(re-)birth of the sun" is investigated with reference to the archaeology and mythology of Newgrange and the Boyne Valley. It is also suggested that these cosmological beliefs were part of a wider European ideological system, a milieu within which these ideas, were communicated differentially at varying regional and local levels. The role of these differences, large-scale communal gatherings and changing communication patterns on the formation of group-identities is explored with reference to the changing importance of the Boyne Valley between the later Neolithic and the beginning of the Bronze Age. The arrival of the 'Beaker Phenomenon' in the British Isles played an important role in changes witnessed in Ireland during this period. It is argued that some of the regional variance in the communication of cosmological ideas during the Neolithic and the integration of the Beaker Phenomenon into, or replacement of, pre-existing belief systems was connected with the concept that particular deities may have had greater importance within particular regions. Furthermore, the relative statuses of deities and their importance in the communication of cosmological beliefs can change across time and space. Although the Beaker Phenomenon is widely researched, the position or role of deities and their relationship with the varying levels of continuity and change manifest in the enactment of cosmological beliefs throughout Europe has not been explored. Here it is argued that the changing "cultic" role or importance of deities within a pre-existing pantheon were altered in the context of the Beaker Phenomenon and that these changes had an inherent relationship with the archery symbolism of the "Beaker Package".

Dedicated to the memories of those friends lost during the course of writing this PhD

Matthew Logue

Emmet Connolly

Caoimhe Muldoon

Laura Yore

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1 Introduction

1.1 Aims, Objectives and Parameters

1.1.1 Overarching Aim

The overarching aim of this study is to investigate how archaeology might contribute to understanding long-term religious structures in prehistoric Europe, with particular reference to the Irish Neolithic-Early Bronze Age. In this context the intention is to identify the endurance of cosmological concepts, their regional manifestations and expression, and the variances in the fluidity of their transfer across chronological breaks alongside their elaboration and re-interpretation across time. The cohesion of these developments in religious concepts, belief systems and their articulation, including those connected with the evolution of ceremonial, burial and monumental traditions, will also be considered in their wider context. As such they will be contextualized with reference to the chronological changes witnessed in other areas of society, such as those connected with changes in social organisation and technologies.

Such a “deep historical perspective” seeks to evoke and establish a sense of historicity in the prehistoric past utilizing a multiscalar approach. It has been advanced (Robb and Pauketat: 2013: 28; Pauketat, 2013a, 2013b: 27-42) that explaining history involves the identification and explanation of how multiple networks intersected and interacted. These networks include and involve the relations between people, things, and ideas, which generate, and result from, structured processes whose patterning is evident at many different scales. Accordingly, this approach seeks to reconcile and connect short and long term chronologies, the intersection of micro-scale human experience with histories as large-scale and long-term phenomena including social forms and cultural traditions (Shryock and Smail, 2011: 11-13; Robb and Pauketat: 2013: 3). As such, it is feasible to investigate the relationships and interactions between cyclical calendrical time which is structured by natural processes and the heavenly bodies (Pauketat, 2013a: 40-44, 2013b: 61-63, 70-77, 80-82), the sense of timelessness provided by religion and belief systems, and lived experience (Van Dyke, 2013).

Deep historical approaches have been applied to the study of the intertwined nature of the cultural constants of sharing food and kinship (which may be extended to communal or group identities in broader terms), both of which facilitate communication across distances and reconnection between individuals and groups after periods apart. Inherently the cultural reproduction of these phenomena are dependent on collective awareness, albeit subconsciously in many instances, of the interactions between the past and present (Fernández-Armesto and Smail, 2011; Shryock and Smail, 2011: 17; Shryock, et al., 2011: 31-52; Trautman, et al., 2011; Pollock, 2013).

The current study will attempt to reconcile developments in communal commensality and group identities with developments in religion, cosmology and belief systems in the Irish Neolithic-Early Bronze Age. As noted by Shryock and Smail (2011: 19) within the discipline of archaeology much more could be said about religion from a deep historical perspective (Shryock and Smail, 2011: 19). It appears advantageous to consider this alongside these cultural phenomena which have received consideration from this perspective. Religion elevates the significance of earthly and celestial happenings, these being the observable patterns and in some instances short-term changes identifiable in the heavenly bodies, landscape, environment and climate. The religious ideas and concepts inspired by these processes, cyclical events and abrupt instances or periods of change are not only expressed through written words or symbolic and iconographic representations as sets of beliefs held in collective consciousness, but are also encapsulated by the experiences of individuals (Pauketat, 2013b: 2-4), and are often framed with reference to commensality and group identities. In addition, as stated by Shryock and Smail (2011: 19) dramatic changes only seem unique if we restrict ourselves to one level of observation. Bearing this in mind, the current study will seek to integrate a number of data-sets and analyse the interaction of processes occurring over differing time-scales.

1.1.2 Aim 1 – calendars and feasting

The first aim of the study is to gain a greater understanding of how Neolithic-Bronze Age calendars could have been structured, and to investigate the role played by calendrically scheduled feasts, with a particular focus on winter solstice feasting. To achieve the first part of the aim the structure of historical calendars will be investigated, before considering the 'natural' cyclical processes which would have informed the 'rhythms' of prehistoric life, before reviewing evidence for monumental orientations and alignments. In order to investigate winter solstice feasting the potential evidence at Newgrange will be analysed and contextualized with reference to Grooved Ware feasting in Britain.

1.1.3 Aim 2 – cosmology and identities

The second aim, to achieve a nuanced understanding of the relationships between cosmology and group identities, is more over-arching and will be touched upon to varying degrees throughout the study, although it will be most explicitly investigated in part II. The first part of this aim involves investigating whether it is possible to begin to identify coherency in cosmological and mythological belief systems reaching back to the Neolithic. From an archaeological perspective a more refined understanding of Bronze and Iron Age mythological and cosmological belief systems has begun to emerge (e.g. Kaul, 1998, 2014; Kristiansen, 2012, 2014; Waddell, 2012, 2014; Melheim, 2013; Ling and Rowlands, 2015) and the current study will seek to assess if belief systems comparable to those identifiable in the 2nd millennium BC (and later) were present in earlier epochs. The second part of the aim is to investigate the potential role of changing 'religious' beliefs in the formation of group identities with a particular focus on those which may have been connected with the Boyne Valley.

1.1.4 Objectives

Objective 1: Investigate how the yearly calendar could have been structured during prehistory (Aim 1)

Objective 2: Investigate the importance of feasting and how it may be identified archaeologically (Aim 1)

Objective 3: Investigate whether Newgrange activity is consistent with contemporary British feasting (Aim 1)

Objective 4: Explore potential evidence for coherent cosmological expression in Neolithic-BA Europe (Aim 2)

Objective 5: Evaluate whether the Birth of Maccan Óc depicts an Indo-European solar myth variant (Aim 2)

Objective 6: Contextualize the Boyne Valley/Newgrange cosmologically, geographically and 'ritually' (Aim 2)

Objective 7: Analyse Beaker 'Archery Symbolism' from a cosmological perspective (Aim 2)

1.1.5 Parameters of the study

The Boyne Valley (Meath) in eastern Ireland has been selected as the core landscape for consideration in the current study, with Newgrange being the central focus. Newgrange was first identified as a case study being the only Irish site with a substantial Late Neolithic-Early Bronze Age (EBA) faunal assemblage and thus the only feasible candidate for investigating (potential) feasting activity. Subsequently it was established that the Boyne region represents an ideal springboard for the investigation of calendrical patterns, cosmology and (changing) group identities, being an area steeped in mythological associations, possessing astronomically aligned monuments containing megalithic art dated to the final centuries of the 4th millennium BC and being the focus of significant activity during 3rd millennium BC, including the international Beaker complex.

While the Boyne Valley and Newgrange (including elements of their associated mythology), provide a focus for the current study, they cannot be considered in isolation. As such, an ambitious target of situating the Boyne Valley within the wider European context has been undertaken. Of course, elucidating the relationship between developments in eastern Ireland and those in Britain are of prime concern and importance, but these can be understood more effectively when Continental Europe is embraced. Consideration of pan-European developments (and Eurasian mythology) provides a frame for those in the British Isles and the Boyne Valley, so there is also an aspiration that the interpretations developed may provide new insights into the period(s) under consideration on a Continental scale.

1.2 Theoretical Perspectives and Methodologies

1.2.1 The Annales Approach, Timescales, and Society as a Complex System

Central to the overarching theoretical perspective of the current study are the frameworks of perceiving society as a complex system and the Annales approach to understanding historical developments. The Annales paradigm divides time into three durations: short-term events (days, weeks, months, a few years), medium-term conjunctures (years, decades and potentially large portions of centuries), and long-term structures (which may last centuries or millennia). It recognizes that the past developmental trajectories of societies are the product of groups of processes or forces operating in parallel at different timescales (Braudel, 1980; Bintliff, 2004: 176, 2008: 156-157). Some of the main concepts used by the Annales are: (1) *Evénéments*: the world of events or the short-term (political events and individual actions); (2) *Moyenne durée*/Conjunctures or the middle-term: forces that work over several lifetimes or several centuries (socio-economic and demographic trends, and ideologies); and (3) The *longue durée* or the long-term: historical processes unfolding over centuries/millennia (geo-history, stable technologies, and world views), including the 'permanent' forces that operate upon society guiding it along certain paths i.e. eco-system, climate, weather systems, celestial realm and physical landscape (Bintliff 1991: 11, 2008: 157). In this context *mentalités* or collective world views are those recurrent cultural patterns which persist over the long-term and affect the shape of social institutions in the middle term (Bintliff, 1991: 6-7, 2008: 156).

Introduction

Although general consensus as to a precise definition of complexity and complex systems remains elusive, fundamentally complexity theory approaches seek to elucidate how large numbers of complicated and dynamic sets of relationships can generate simple behavioural patterns. Frequently, over extended but finite periods complex systems remain fundamentally unaltered due to structuring principles which allow them to remain stable in the long term, with change occurring gradually or incrementally, with no great transformation from one generation to the next. However, this 'equilibrium' will be interrupted sporadically by abrupt, rapid or intense periods of radical, profound or catastrophic change (e.g. Bintliff, 2004: 187-189).

Drawing upon an understanding of societies or civilisations and their development as explained within complexity theory (see Byrne, 1998: 14-34; Manson, 2001; Bintliff, 2003, 2004; Bentley and Maschner, 2008: 245-246, 254-256) the current author summaries them as follows. Approaching society as a complex system it can be seen to involve various sub-systems, including such categories as social structures, networks and belief systems (i.e. internal structuring principles) and be composed of numerous autonomous agents (i.e. individuals and groups). In addition, the environment within which societies are situated is itself a complex system composed of various sub-systems (e.g. eco-system, climate, weather systems, celestial realm and physical landscape). These components also represent parameters (i.e. external structuring principals) which inform the structure of societies, allowing them to function, develop, and remain stable across time (potentially over the *longue durée*). In the current study particular attention is paid to the role of the physical landscape and cyclical processes connected with the celestial bodies and seasons.

The Annales approach also posits a symbiotic relationship between a society's internal sub-systems and those groups who employ them, as the sub-systems (usually) inform and constrain the decisions and actions of those who utilise them, but their existence is contingent upon acceptance and transmission by the very same groups and individuals. In essence, it is argued by Annales scholars that it is this dynamic which allows societies and 'traditions' to remain stable and virtually unchanging over extended periods or the *longue durée*, and developments to manifest as gradual, cumulative processes in the short- to medium-term. This dynamic and the presence of these structuring principles also serves to (generally) limit the impact of individual agents upon historical trajectories, allowing the continuation and persistence of social practices, norms and traditions (i.e. continually reinforce acceptance of cultural constraints). However, notwithstanding such pressures, it is argued that the developments within, and trajectories of societies, civilisations and their sub-systems are also contingent upon sequences of irreversible and unique, non-recurrent histories. These are shaped considerably, but subtly, by unique individuals, groups, conceptions, creativity, inventions, culture-historical circumstances and combinations of novel, discrete and cyclical events, which facilitates the potential for periods of change involving the creation of novel forms (ranging from the creation of new pottery forms and artistic designs to novel forms of social institution to organization), the diversion of developmental trajectories and the emergence of more complex traditions or social structures.

1.2.1.1 Methodological application of the Annales approach, timescales, and complexity in the current study

As noted above, the Annales approach and perceiving society as a complex system form the overarching theoretical perspective of the current study. The implementation of these theoretical perspectives can been seen in the overall scope and structure of the study as it draws upon a wide range of datasets to explore Neolithic-Bronze Age society from a variety of interrelated perspectives encompassing calendars, feasting, cosmology and identities in order to explore Neolithic-Bronze Age society in eastern Ireland. These perspectives are implemented further within the framework of the study as it encapsulates a selection of societal sub-systems and structuring principles on the one hand and documents the development of their trajectories over varying timescales on the other. Throughout the study, although perhaps most explicitly in chapter 7, particular attention is paid to the structuring role of the physical landscape and cyclical processes connected with the celestial bodies and seasons. These forces operate in parallel and at different timescales to allow societies to remain stable over time, and fundamentally guide, inform and perhaps in some scenarios constrain a societies' developmental trajectory. The implementation of the Annales approach in chapter 5 may also be highlighted, as the development of belief systems and their symbolic representation over the *longue durée* is considered through a combination of historical cosmological concepts, mythological narratives and a variety of prehistoric symbols from different geographic and chronological periods.

The Annales concept of time is also drawn upon in order to elucidate the potential structure of prehistoric calendars within chapter 2. In this context, and taking an ethno-historical approach, the structure of historical calendrical systems is juxtaposed alongside the 'natural' cyclical processes which would have informed the 'rhythms' of prehistoric life in order to provide a model for how prehistoric calendars may have been structured.

The potential for there being stability in cosmological and mythological traditions over time is discussed in detail in chapter 5 (see: cross reference), so the argument will not be repeated at length here. However, some of the main points may be summarized. As noted by Vansina (1985: 190-193) mythological narratives and traditions undergo processes of selection and streamlining over time on the one hand, but also a concurrent process of cumulative elaboration as new technologies, practices and social structures are legitimized or 'naturalized' through integration into the cosmological system. This leads to narratives becoming both 'streamlined' as essentials are kept, but concurrently more elaborate over time as relevance to the 'present' is maintained. In addition to these trends are the processes which involve the reformulation of deity pantheons, which can involve the integration of previous deities into single figures, the splitting of single figures into a number of new deities, and the redefinition of a deity's role and/or associated attributes within the pantheon (see Olmsted, 1994 for examples). Undoubtedly the development of these narratives are affected by accumulative 'interpretation' (Vansina, 1985: 195-196), but no matter how many successive encoders have altered original messages through selection or interpretation, they are also constrained by the previous interpretations. Additionally, new versions are constrained by the structure and 'essential' elements of older ones as these represent 'truths' which must be retained to 'legitimize' the elaboration and framing of newly developed versions. Furthermore, it may be argued that these narratives do show considerable stability over spans of centuries, as is common to oral histories and traditions on the whole. Witzel (2012: 437) has argued that cross-cultural comparisons indicate that once established motifs persist over considerable time spans. This is partially explained by the fact that myths are transferred to younger generations through the socialization process and communities require myths to structure and explain their collective experiences over the longue durée.

Concerns could be raised about the validity of projecting Indo-European mythology back into the Neolithic. It could in fact be argued that substantiating the existence of Indo-European or proto-Indo-European languages in the Neolithic would be required in order to confidently contend that these mythological traditions existed before the 2nd millennium BC. There is ongoing debate about when Indo-European languages first emerged and spread across Europe. Some researchers (e.g. Mallory, 1996, 2002, 2013: 243-286; Kristiansen, 2005, 2009, 2011) argue that this occurred during the Bronze Age as a result of the 'Kurgan' migrations, while others (e.g. Renfrew, 1999, 2000: 24-30, 2005; Comrie, 2002, 2008; Zvelebil, 2002) contest that this occurred alongside the spread of farming during the initial advance of the Neolithic into Europe. Support for the earlier farming associated spread was offered in the 2000s by a number of studies (e.g. Forster and Toth, 2003; Gray and Atkinson 2003, Atkinson, et al. 2005; Atkinson and Gray 2006) which calculate language-tree divergence times through the employment of phylogenetic methods. Further studies using variations of these methods in more recent years (e.g. Gray, et al., 2011; Bouckaert, et al., 2012; Pagel, et al., 2013; Chang, et al., 2015) have also concluded that the Neolithic hypothesis appears to be the most plausible. Additional support for the theory has also been advanced by studies combining linguistic data with the chrono-geographical patterns present in archaeological evidence (Anthony and Ringe, 2015) and ancient DNA (Klyosov and Tomezzoli, 2013). Weighing up this information, although complete certainty cannot be claimed, it appears reasonable to advance that Indo-European did in fact spread as part of the 'Neolithic package'. As such, by extension it may be advanced that Indo-European mythology would also have spread in this context and thus would have been present across Europe during the Neolithic.

As noted previously, Bronze and Iron Age mythological and cosmological belief systems have begun to be understood with more clarity (e.g. Kaul, 1998, 2014; Kristiansen, 2012, 2014; Waddell, 2012, 2014; Melheim, 2013; Ling and Rowlands, 2015). Bearing this in mind a longue durée perspective will be taken in chapter 5 where potential evidence for cosmological and mythological stability will be explored. In this context an investigation of whether three-tier cosmologies and solar journey-associated mythologies connected with the importance of the winter solstice are identifiable throughout the European Neolithic and Bronze Age periods.

Chapter six will focus on the Irish 'Birth of Maccan Óc' myth connected with Newgrange and it will be advanced that echoes of aspects of a more widespread myth connected with the yearly solar journey and the winter solstice are present in the tale. Within medieval tradition Brug na Bóinne was recorded as the dwelling place of the Tuatha Dé Dannan, including the Dagda and his son Óengus (Waddell, 2014: 55; Sherwood, 2009: 202). Waddell (2014: 55) highlighted the fact that that O'Kelly (1982: 43-48) thought it possible that Newgrange's association with these deities was the reason for the enduring sanctity of the monument and its focus as an offering place in Roman times. Waddell also drew attention to the possibility that European cosmological ideas associated with the solar journey were present in Ireland during the Bronze Age and maybe even the Neolithic. Swift (2003) has argued that the gods and mythology described in the medieval literature reflects the late prehistoric belief system, but that the narratives and figures are no older than the late Iron Age/Roman period. The current author would agree that the medieval texts are based upon Iron Age narratives, but contra Swift (2003) would argue that the Iron Age narratives have their origin in the LBA. The identification of deities with horses for example suggests that the Irish pantheon, such as it was recorded, cannot be any older than the MBA when horses appear in the archaeological record (see McCormick, 2007b; Bendrey, et al., 2013), and as was witnessed elsewhere were undoubtedly integrated into the mythology. However, it may be proposed that the belief system of the later Bronze Age has its roots in the earlier Bronze Age and ultimately the Neolithic, as may be identified by the continuities of practice visible in the archaeological record.

1.2.2 The archaeology of religion & the cognitive science of religious beliefs

Theoretical perspectives developed within the field of the archaeology of religion and within the cognitive science of religious belief are also employed in the present study. The absence of discussions of religion in much archaeological interpretation is unlikely to reflect past realities. While the possibility exists that religious beliefs/thoughts can be of primary importance in structuring all activity around which secular concerns are fitted, regardless of the social system being considered, the reverse of the often posited framework (Insoll, 2004a: 3, 5), an assumption of the universal centrality of religion is also unwarranted (Fogelin, 2007: 60; Rowan, 2011: 2). As noted by Insoll (2004a: 5) in contemporary society religion provides the overarching framework for other aspects of life (at least as outwardly manifest) for the vast majority of the world's population. In this context, it may be advanced, as outlined by Barrett (2011: 236), that insights from the cognitive science of religion may be particularly useful. If we can safely conclude that (a) past individuals had comparable basic cognition to contemporary peoples; and (b) ordinary human cognition is sufficient for generating religious ideas and practices (as argued within the cognitive science of religion); then archaeological evidence indicating the presence of coherent 'religion' and recurrent evidence for 'religious' symbolism can be accepted as not only inferring, but confirming their existence (for discussion of common criticisms of the cognitive science of religion see Cohen, et al., 2008).

Biological, cognitive and neuro-psychological research suggests that strong cross-cultural tendencies to believe in the existence of supernatural agents to whom notions of morality, misfortune, and the creation of the world are attributed are the result of cultural manipulations of psychological adaptations (d'Aquili and Newberg, 1998; Bering, 2006a, 2011; Barrett and Lanman, 2008; Boyer and Bergstrom, 2008; Shariff, et al., 2010; Bulbulia and Schjoedt, 2011; Inzlicht, et al., 2011; Willard and Norenzayan, 2013). Consequently, religions are both a cognitive by-product and a consequence of long-term cultural evolution (Boyer and Bergstrom, 2008; Shariff, et al., 2010; Willard and Norenzayan, 2013), but human cognition strongly constrains the variety of recurrent forms of religious thought, behaviour and representations, e.g. mental representations of supernatural agents, paranormal belief, belief in life's purpose, and moral systems, as well as specific experiences associated with these representations (Boyer and Bergstrom, 2008; Shariff, et al., 2010; Bering, 2011; Willard and Norenzayan, 2013). For instance research by Metzinger (2005) and Bering (2006b, 2011) suggests that out-of-body experiences facilitated by neurological/cognitive biases or 'errors' may explain the origin of the cross-cultural concepts of a 'soul' and by extension belief in an afterlife. The occurrence of cross-cultural religious beliefs appear to be supported by intuitive social-cognitive tendencies (Kelemen, 2004;

Preston and Epley, 2005, 2009; Bering and Parker, 2006; Bloom, 2007; Kelemen and Rosset, 2009; Inzlicht and Tullett, 2010; Bering, 2011; Haque, et al., 2011; Shenhav, et al., 2012), but as outlined by Barrett and Lanman (2008: 119-121) theological concepts require special cultural 'scaffolding', such as Whitehouse's (2000, 2004) two 'Modes of Religiosity': (a) the Imagistic Mode, i.e. the transmission of central theological insights through rarely performed but highly emotional events; and (b) the Doctrinal Mode, i.e. theological transmission through frequently performed, relatively low-arousal events.

As noted by Rowan (2011: 1-2) archaeology has the potential to make a unique contribution to the study of change in religion and 'ritual' practice because of the *longue durée* perspective of society it can draw upon (for a summary of anthropological research into religion see: Bowie 2006; for archaeology of religion see: Insoll, 2005). As stressed by Insoll (2004a: 5) the material implications of the archaeology of religion are profound and we need to approach religion as part of a holistic package and a *possible* component underlying all material culture use and meaning. We need to recognise the potentially embedded nature of religion as a (sometimes the) key element informing identities. Religion is often expressed through performance and is manifest in a variety of ways in the archaeological record, including material paraphernalia, iconographic representation, or sacred natural and built space and landscapes (Rowan, 2011: 1 see also Renfrew, 1994; Insoll, 2004b) and recently, there has been a proliferation of publications focusing on 'cult', 'ritual', and 'religion' from archaeological perspectives (e.g. Insoll, 2004b; Whitehouse and Martin, 2004; Bradley, 2005a; Barrowclough and Malone 2007; Kyriakidis 2007; Whitley and Hays-Gilpin 2008). All of these studies have been informed by the idea that religious belief and practice may be studied in the past, yet the extent to which these studies engage with reconstructing religious beliefs and actions is variable (Insoll, 2009).

Archaeological consideration of 'ritual' and religion is often underlain by an assumption that labels and definitions derived from other disciplines, such as anthropology or religious studies, are directly applicable to different contexts, even if far removed geographically and temporally. In addition terms such as 'totemism', 'animism' and 'shamanism' are commonly misused, being wrongly defined and applied as 'actual religions' when in reality they represent elements of religious systems (Insoll, 2004a: 2; 2009). In fact, in the case of the latter, the cross-cultural applicability of the terms 'shaman', 'shamanic' and 'shamanistic' are in themselves questionable (for recent discussion see Sidky, 2010) and although a significant body of evidence indicates that engagement in altered states of consciousness by specialist magico-religious practitioners has been widespread historically (Winkelman, 1986a, 1986b, 2007, 2010, 2011, 2013; MacDonald, et al.; Ustinova, 2009, 2011; Geels, 2011; Wilson, 2013), these do not represent central belief systems, but elements of their respective paradigms. The utilization of other 'loose terminology' in Neolithic-Bronze Age contexts that may be highlighted includes the over-use of the term 'ancestor'. It received particular attention and debate in Britain (e.g. Barrett and Fewster, 1998; Whittle, 1998; Whitley, 2002, 2003; Pitts, 2003) following the 'Stonehenge for the ancestors' article by Parker Pearson and Ramilisonina (1998), but ongoing reference to generic 'ancestors' as a basis for overarching explanations is for example notably evident in Iberian interpretation (e.g. Bueno Ramírez and de Balbín Behrmann, 2006a, 2006b), as is an over-reliance on other vague terms such as 'warrior ideology' in describing 3rd millennium BC belief systems (e.g. Guilaine and Zammit, 2005: 162-167; Vandkilde, 2006; Heyd, 2007a).

The most coherent insights into belief systems may come from the analysis of symbolic systems as they represent coherent non-verbal languages employed and intended to be understandable. If symbols are organized in complex systems, then knowledge of some aspects of the symbolic system could be used to infer other parts. In theory it may be possible to identify a key symbol (or symbols), through the identification of repeatedly occurring motifs. In addition, through the structural regularities in the relationship between 'ritual' practice and religion it may be possible to investigate symbolism and belief in the past and infer symbolic meanings from material remains, even in the absence of historical or ethno-historical sources (Renfrew, 1994: 53; Fogelin, 2007: 63). Of course, as highlighted by Renfrew (1994: 53-54) a question surrounds the extent to which disparate evidence may justifiably be brought together for simultaneous consideration in the search for symbolic meaning, but by considering a range of specific motifs it may be reasonable to infer, in some instances, that a single coherent system is in operation. Among his 'archaeological indicator of ritual' Renfrew (1994: 51-52) included three associated with 'presence of the deity': (a) the association with a deity may be reflected in the use of a cult image or a representation of the deity in abstract form; (b) the 'ritualistic' symbols will often relate iconographically to the deities worshipped and to their associated myth. Animal symbolism (of real or mythical animal) may often be used with particular animals relating to specific deities or powers; and (c) the 'ritualistic' symbols may relate to those seen also in funerary 'ritual' and in other rites of passage. Where written sources describe religious beliefs, mythologies, symbolism, and other forms of religious expression they provide ethno-historical guidance on the interpretation of material remains, as has been demonstrated by studies in the Americas (for examples see: Fogelin, 2007: 63-64). Although written records are absent for the majority of the European Neolithic-Bronze Age, in the current study Irish, Eurasian and Egyptian mythology have been utilized to inform interpretation ethno-historically, as these represent the most viable window to the belief systems that existed (Egyptian mythology, which is contemporary with the period under consideration, has been included as it is demonstrably connected with later mythologies found elsewhere in the east-Mediterranean and Near East). It should be noted that some of these records were compiled during the 3rd and 2nd millennia BC and undeniable relationships exist between these and later records.

1.2.2.1 Methodological application of perspectives and insights derived from the archaeology of religion & thecognitive science of religious beliefs

The aim of chapter 5 is to explore whether Neolithic-Bronze Age symbolic and iconographic evidence supports the argument that there existed coherent and comparable cosmological and mythological belief systems across Europe, not only during, but prior to the 2nd millennium BC. In each section an aspect of Eurasian mythology which contains explicit references to a three-tier cosmology and/or the daily solar journey is outlined. These discussions are then followed by a review of evidence for corresponding symbolic and iconographic representations in Neolithic and/or Bronze Age Europe. Representations in a number of media are considered ranging from open-air petroglyphs and megalithic art, to decorations on ceramic objects and vessels, and ornamentation on various classes of metalwork including items rendered in copper, bronze and gold. Creation myths, journey of the sun myths, and solar symbolism are all considered. The relationship between boats and the sun's daily journey and the relationships between the Milky Way, rainbows, and the journey of the sun are also explored. Solar-journey and Milky Way associated mythologies connected to horses, birds and cattle are also analysed, as are the connections and inter-changeability of serpentiform and marine species symbolism and their relationships with three-tier cosmology, the daily solar journey and the Milky Way. Possible associations between weapons (primarily axes, daggers and bows-and-arrows) and/or their iconographic representation and symbolism associated with a three-tier cosmology and/or the daily solar journey is also discussed.

In chapter 6, the focus is on the nine-month yearly solar journey from the spring equinox to the winter solstice and the Irish 'Birth of Maccan Óc' myth connected with Newgrange. The main protagonists of the Irish myth, the skyfather, river/earth goddess, their son, and the goddess' brother/husband, are contextualized within wider Indo-European tradition with a view to demonstrating that they represent local versions and are cognates for deities found across the Continent. It is advanced that echoes of aspects of a more widespread myth connected with the yearly solar journey and the winter solstice are present in the 'Birth of Maccan Óc' tale. In support of this theory a number of Eurasian myth variants displaying clearly similar structures are outlined.

Chapter 7 also utilizes perspectives and insights derived from the archaeology of religion to investigate how cosmological and mythological concepts connected with the 'journey of the sun' and the three-tiered cosmos may have informed spatial, architectural and iconographic representation in the structure and siting of monuments in Brú na Bóinne. In addition, as a contribution to further understanding possible interaction with these structures by individuals, insights from the cognitive science of religious beliefs are utilized to investigate whether 'after-death communications' could have been facilitated by passage tomb architecture. In general terms "After-Death Communications" (ADCs) although sometimes perceived as a form of "ghost encounter", are more appropriately defined as "sense of presence experiences" (Kwilecki, 2011; Steffen and Coyle, 2012). Numerous psychological, medical and related studies (e.g. Chan, et al., 2005; Field, et al., 2005; Goss and Klass, 2005; Klugman, 2006) indicate the cross-cultural prevalence of the "sensing of presence" concept and apparent communications after death are a worldwide phenomenon occurring across historical periods. The impact of ADCs as religious reinforcements varies with tradition, but it is notable that when socio-religious conceptual frameworks legitimize ADCs, conversation with deceased members of a community facilitates their re-construction as honoured ancestors (Walter, 1996; Klass and Walter, 2001). Furthermore, where the dead hold prominent cosmological roles or positions, ADC experiences tend to validate faith comparatively forcefully. They can also facilitate conversion to a (religious) faith, as they are commonly construed as evidence of a previously unacknowledged supernatural order (Kwilecki, 2011: 238-241, and references). In the present study, comparison with psychological research into techniques for evoking ADC imagery in restricted sensory environments (Hood and Morris, 1981; Terhune and Smith, 2006, Merz, 2010; Hastings 2012) is used to argue that passage tombs would have been extremely conducive to facilitating relatively easily induced ADC experiences for non-specialists over short periods.

Another form of evidence which can be employed when investigating the expression of religious ideas and belief systems in the prehistoric past are burial practices. In recent decades Chalcolithic-Bronze Age burial practices and customs have been analysed and understood from a variety of perspectives. These include exploration of burial practices in terms of fragmentation and circulation (e.g. Thomas, 2000; Woodward, 2002; Fowler, 2005; Parker Pearson, et al., 2005) ; as social transactions reconstituting the social identity of the deceased and redefining relationships among the living (e.g. Barrett, 1990; Brück, 2004, 2006b; Woodward, et al., 2005); and variously in terms of age, gender and kinship ties (e.g. Turek, 2000, 2011a, 2011b, 2013a, 2013b; Müller, 2001; Sofaer Derevenski, 2002; Montón Subías, 2007, 2010). In chapter 8 Beaker 'archery symbolism', frequently suggested to infer the existence of 'warrior' ideology, is approached from a new perspective centring upon potential religious connotations and "cultic" association.

1.2.3 Sub and Superordinate Identities

Researchers concerned with issues of identity have highlighted various aspects of how identities are created, defined, and maintained that are relevant to the present study. In particular, there has been research focused on understanding how collective, superordinate identities are created and maintained, how distinctions between sub-group and superordinate identities may be manifested, and how material culture may be used to signal and negotiate identity (e.g. Hays, 1993; Gaertner, et al., 2000; Hewstone, et al., 2002 ; Lipponen, et al., 2003).

At the micro-level culturally defined identities may demarcate the negotiation of personhood, which may encompass gender, age grades and/or social position. However, at the macro-level identity predominantly refers to group or sodality membership (of both individuals and sub-groups), which may relate to such associations as kin-group affiliation, alliances or even large-group identity such as religious, ideological, cultural or ethnic fraternity (as will be considered in the current study). It has been argued that the latter (large/superordinate), may be regarded as categories rather than strictly as groups, because they are based upon an internal definition in which anonymity (of individuals and sub-groups) is essentially assumed within a mass society (Jenkins, 1997: 81). As such, identity within large collectives or social categories is based upon the common (collective) identity itself, as opposed to common bonds between members. Therefore, membership or identification with a superordinate category does not require personal relationships among group members (Brewer and Gardner, 2004: 67). However, it must be noted that the existence and stability of any given superordinante identity, and thus the cohesiveness of the 'collective', will endure across time if it is the identity and its associated beliefs, ideology or customs with which people associate or identify, rather than a particular individual (such as a leader). This is because essentially every person is directly connected to every other through the identity and/or beliefs. Conversely, when people identify with a charismatic leader, unless they are satisfactorily replaced, the collective's cohesiveness and shared identity will wane and (potentially) disappear.

For both individuals and groups, membership of superordinate, impersonal collectives depends upon knowledge of and identification with the category, the acquisition of traits or attributes associated with it (such as values, beliefs, customs, traditions, practices, material culture and artistic motifs, patterns and designs) and self-identification as exemplars (i.e. having characteristics that are representative) of that social category, without necessarily being aware of the actual geographical spread of the entire group. Therefore, the identification of potential superordinate identities within the archaeological record must equate to distinguishing the widespread occurrence of archaeologically visible cultural attributes (such as those associated with the Beaker complex and other archaeological 'cultures') on both a regional and inter-regional basis. Such shared traits may include a combination of material culture, artistic motifs (patterns and designs), housing styles, subsistence practices, burial and/or other depositional practices, monumental traditions and the occurrence of comparable or even uniform means of negotiating the utilisation of the "culturally meaningful" landscape from a (potentially) religious perspective.

Material culture and decoration can be an important means of signalling and negotiating identity at varying levels of significance (Hays, 1993: 88). The systematisation and rationalisation of distinctive cultural styles in the process of recognition, expression and negotiation of superordinate identities is likely to result in discontinuous, non-random distributions of material culture, an untidy, overlapping web of stylistic boundaries in various classes of material culture, in different contexts. Notwithstanding, the simultaneous salience of sub-group identities may disrupt regular spatio-temporal stylistic groupings, resulting in boundaries which are discontinuous in space and time. As such, any distinctive non-random distributions of particular styles and forms of material culture in different contexts which emerge, may relate to the expression of sub-group identity (Jones, 1996: 72-73) when concurrent identities exist. Style may be used to express sub-group identity because numerous groups included in a superordinate category share attributes and artefact types and frequently possess social and cultural commonalities, whilst exhibiting considerable variation within the group (*ibid*.: 66). As artefacts and decoration are produced in terms of what individuals and their reference groups deem to be appropriate, minor differences in style, the decorative motifs employed and/or the overall composition may relate to the expression of sub-group identity (Graves-Brown, 1996: 87).

The acquisition of a superordinate identity (such as those which could have been connected with the Boyne Valley or the Beaker phenomenon) can lead to the occurrence of dual identity, which is when sub-groups retain and share a common identity. In such circumstances, inter-group 'us' and 'them' perceptions are replaced with an inclusive 'we' definition. Furthermore, if equal-status interaction occurs (i.e. no groups are considered to be of lower status, oppressed or marginalized), and sub-group identities remain salient and unthreatened, then commonalities among groups act to reduce bias and negative attitudes between them (Gaertner, et al., 2000; Hewstone, et al., 2002: 591-592). As such, when sub-group identity is maintained then the potential for feelings of threat to the distinctiveness of the sub-groups involved is reduced.

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However, if sub-group identities are subsumed by the superordinate, then motivations to re-establish threatened distinctiveness may develop and biases against groups which are included within an inclusive category at the macro-level, but are concurrently recognized as out-groups at the mirco-level of identification may become prominent or exaggerated (Crisp, et al., 2006). Additionally, if members identify strongly with both their sub-group and superordinate identities, then in-group projection may occur. This is when members perceive their in-group as prototypical for the inclusive category and others' differing characteristics to be norm-deviating and negative, resulting in biases (Wenzel, et al., 2003). Under such conditions the positive effects of superordinate identification on sub-group relations may be limited to only some of the sub-groups (Lipponen, et al., 2003), potentially those with most in common and/or those with well-established and ongoing contacts.

Alternatively, if crossed or multiple categorisation occurs, i.e. a number of categories of identification exist simultaneously (including various, individual, sub-group and superordinate identities), then 'other' sub-groups may be simultaneously classified as in-group or out-group on multiple dimensions (Crisp and Hewstone, 2000). Shared or overlapping category memberships reduce out-group bias for a number of reasons. For instance, they make social categorisation more complex, decrease the importance of any one in-group/out-group distinction and make perceivers aware that the out-group consists of different sub-groups. Thus, cross-cutting social identities manipulated as part of co-operative, equal-status contacts serve to increase intra-category differentiation and decrease perceived inter-category differences. However, biases are not always reduced and the effectiveness of crossed categorisation is particularly limited when one category is functionally dominant, when categories are correlated (i.e. when one implies the other) or when sub-groups are under threat, which cause social identities to be defined in more exclusive and less complex terms (Hewstone, et al., 2002: 592-593).

As the materialisation of dual or crossed/multiple categories of identification are most effective when sub-group and superordinate identities co-exist, it can be advanced that such conditions may permit for attributes associated with superordinate identities (such as values, beliefs, customs, practices, traditions or material culture) to be negotiated at the local level by sub-groups. Thus, such attributes will be accommodated within and integrated into the pre-existing dynamic. Therefore, superordinate identity may be identifiable through the widespread occurrence of particular cultural traits such as shared material culture (and associated decorative motifs and patterns), burial practices or monumental traditions. But as superordinate identity may be negotiated at the local level and can co-exist with sub-group identity new cultural elements may be deployed within the pre-existing cultural milieu and elements thereof need not necessarily be superseded. Consequently, the way in which new cultural elements or attributes were integrated at local and regional levels could provide information about the type (i.e. religious, ideological, cultural or ethnic fraternity) and form superordinate identities may have taken in the past.

1.2.3.1 Methodological application of the theories on subordinate and superordinate identities

The relationship between feasting and the formation of superordinate communal identities is explored in chapter 3. In the first half of the chapter an ethno-historical approach is taken in order to engage with feasting activities from a theoretical perspective. In the present study there is an explicit focus on the differences between 'competitive' and 'solidarity' type feasts, the 'benefits' connected with these different forms, and the importance of such events in the creation of superordinate group identities. The second half of the chapter focuses on how the physical remains of feasting events may be identified archaeologically, and again an ethno-historical approach is employed. The identification of remains is examined under the headings of (a) landscape setting; (b) specific combinations of archaeological features and materials; and (c) evidence for performance, commemoration and ceremony. These headings are also employed in chapter 4 where the potential evidence for winter solstice feasting at Newgrange is investigated and contextualized with reference to contemporary British evidence.

In chapter 7 the significance of the large Boyne Valley passage tombs is investigated from a communal perspective and is considered in terms of their initial construction and subsequent use during large-scale gatherings. In addition, the possibility that a superordinate 'Boyne Valley associated' group identity existed during the Neolithic is investigated with reference to the materials utilized in the construction of the Newgrange 1 and Knowth 1 structures. In chapter 8 it is argued that the Beaker phenomenon represents a superordinate identity ingrained with cosmological, mythological and potentially 'theological' connotations. The implications of the arrival of the Beaker phenomenon in Ireland for pre-existing identities associated with the Boyne Valley is also be addressed.

1.3 Overview of the current study

The current study is divided into three sections the first of which (I) comprises three chapters and is focused on calendars and feasting; the second (II) which contains four chapters concentrates on cosmology and identity; with the third (III) consisting of a single chapter developing the final discussion and conclusions.

Introduction

Section I - Calendars and Feasting

Chapter 2 (Possible Structure of Prehistoric Calendars in the British Isles) draws upon ethno-historical data to review Eurasian and Egyptian calendrical structures and the cross-cultural importance of the winter solstice. It also considers the significance of 'natural' cyclical processes which would have informed the 'rhythms' of prehistoric life in structuring prehistoric calendars. Finally archaeo-astronomical evidence for monumental orientations and alignments which may have been primed with calendrical concerns are reviewed, with a particular focus on 'passage tombs' in the British Isles and on the Continent.

Chapter 3 (A Background to Feasting: the theory and the evidence) is theoretical in perspective and utilizes a combination of ethnographic and ethno-historical analogy. The first part of the chapter outlines the significance, benefits and material expressions of feasting with particular emphasis on differentiation between 'competitive' and 'solidarity' feasting, the latter being more synonymous with (large-scale) calendrically scheduled communal gatherings. The second part of the chapter focuses on recognizing evidence for feasting archaeologically.

Chapter 4 (Late Neolithic Newgrange and Grooved Ware Feasting in the British Isles) reviews evidence for large-scale Late Neolithic Feasting in Britain and investigates potential Grooved Ware associated feasting evidence at Newgrange. In reviewing the British evidence there is a particular focus on Durrington Walls as it represents the quintessential and most heavily investigated feasting site of the period, in addition to being extremely comparable with the evidence at Newgrange.

Section II - Cosmology and Identity

Chapter 5 (Eurasian Cosmology: the sun, the boat and the Milky Way) begins to investigate whether true coherency can be identified in cosmological and mythological belief systems reaching back to the Neolithic through a combination of reviewing ethno-historical information and investigation of iconographic representation. The chapter is quite broad in scope as it seeks to integrate information from a wide geographical area, encompassing the European Continent and a chronological range embracing both the Neolithic and Bronze Age. With such a broad spectrum of material to synthesize, an emphasis has been placed on the inter-related 'journey of the sun' and Milky Way associated mythologies, and three-tier cosmology. In terms of symbolic representation it has been necessary to consider the occurrence and prominence of a spectrum of motif 'types', including possible solar-related symbols, ship-symbolism, 'bow', lotus/lily, 'arboriform', horse, bovine, avian and 'serpentiform' motifs, as well a variety of 'weapons'. Both this and Chapter 7 refer to megalithic art, but a review of past approaches to (Irish) megalithic art has not be undertaken in the current study (for recent summaries see Cochrane, 2006; Robin, 2009; Hensey, 2010).

Chapter 6 (The Birth of Maccan Óc: An Irish variant of a widespread story) evaluates whether the Irish mythological tale the 'Birth of Maccan Óc', which is strongly associated with Newgrange and the Boyne Valley, is a variant (or contains remnants) of calendrically anchored Indo-European solar journey myths. The myth and its central figures (the Dagda, Bóand, Nechtain and Óengus Mac ind Óc) are considered within their Celtic and Indo-European contexts and particular consideration is given to similarities with particular Vedic, Egyptian and Greek myths.

Chapter 7 (Newgrange & Brú na Bóinne Contextualized: Cosmology, Geography and Ritual) at its core considers how cosmological/mythological understandings, particularly those connected with the 'journey of the sun' and the three-tier concept may have been integrated into spatial conceptions of the Boyne Valley and the architecture of Newgrange 1, Knowth 1 and Dowth. Interactions between the region as a liminal location and the architectural representation of the three-tier division of the cosmos physically and iconographically lay the foundation for engagement with solar associations in terms of monumental alignments and directional movement around the valley. Some consideration is given to how the materials used to construct the monuments may help inform how widely group affiliation with the Boyne Valley may have stretched. Finally drawing upon cognitive- and neuro-psychological insights the potential for passage tombs and megalithic art to have facilitated 'after-death communications' (ADCs) and how such experiences may have strengthened both individual beliefs and identification with group identity are considered.

Chapter 8 (The Beaker Complex, Archery Symbolism and Changing Identities) reviews current understandings and interpretations of the Beaker complex. Particular consideration is given to the 'archery symbolism' for which the Beaker 'package' is renowned and it is analysed from a cosmological perspective with the assistance of ethno-historical information. In this context a nuanced interpretation of the Beaker 'phenomenon' is advanced arguing that it represented a mythologically and 'theologically' associated supordinate identity.

Section III - Enduring, but not static,concepts and frames of reference

Chapter 9 (Discussion and Conclusions) aims to synthesise the themes raised by the aims of the study in an Irish context and contextualize how these developments were manifest in the Boyne Valley. Taking the Irish passage tomb tradition as an example, a basis for acknowledging the presence of coherent beliefs systems reaching back to the Neolithic is outlined. This brings together the structuring principles of natural cycles, calendrical system and landscape with the significance of architectural and iconographic representation of cosmological and mythological concepts. The manifestation of these developments are then expanded upon and given further chronological resolution through the lens of the Boyne Valley.

Section I
CALENDARS & FEASTING

2 POSSIBLE STRUCTURE OF PREHISTORIC CALENDARS IN THE BRITISH ISLES

2.1 INTRODUCTION

The aims of this chapter are to investigate how Neolithic-Bronze Age calendars could have been structured and to outline the role of calendrically scheduled feasts within this milieu. Firstly, the structure and divisions present within historical calendrical systems are reviewed, as these provide a number of clues as to how prehistoric calendars may have been structured. Secondly, the economic and ceremonial importance of calendrically scheduled feasts is outlined. Particular focus is given to winter solstice festivals, as evidence for potential winter solstice feasting at Newgrange (Meath) is subsequently reviewed in chapter 4. The third section aims to elucidate the potential structure of prehistoric calendars and a model is advanced. This draws upon a combination of the structures evident in historical calendars and the 'natural' cyclical processes which would have informed the 'rhythms' of prehistoric life. The final section reviews trends in Neolithic monument orientations and alignments, including evidence for potentially calendrically significant patterns, which have been identified both on the Continent and the British Isles.

2.2 CALENDARS

Many of the earliest samples of writing are related to the astronomical record keeping that enabled the development of sophisticated calendrical systems (Penprase, 2011: 133). The fundamental and cross-cultural structures present in historical calendars undoubtedly originate in prehistoric contexts and at their heart these principles are a combination of natural seasonal changes and lunisolar patterns. These are in turn intrinsically linked with cyclical economic activities onto which a combination of ceremonial or religious concerns were appended, and coming full circle, particular significance became attached to certain astronomically defined points of the year. This chapter will seek to identify the natural cycles that form the basis of calendrical systems and disentangle the relationships between these and the structure of historical calendars and economic activities in order to elucidate the possible structure of prehistoric calendars. In the final section of the chapter the orientation of megalithic (and other) monuments will be considered, but it must be stated from the outset that the presence of calendrical systems in prehistoric Europe is not dependent on the identification of architecture with astronomical alignments. Calendars are fundamentally built around observable natural cycles, those of the sun, moon, seasons, flora and fauna, none of which are a human construct. The presence of astronomical alignments may help to clarify aspects of a calendar system that was in use in the past, but they should not be the primary starting point when exploring the subject. Conversely an absence of astronomically "significant" alignments should not be used to argue against the presence of calendars with strong connections to the regular patterning of the lunar and solar cycles as their observation, identification and commemoration are not contingent on monumentalized duplication.

2.2.1 The Solar Cycle and the Seasonal Calendar

The astronomical year (otherwise known as the solar or tropical year) is the period in which the sun moves round the full circle of the zodiac, or the earth revolves around the sun in its orbit, i.e. 365-366 days. The moment at which the solar year starts is a matter of convention. Some have taken either the vernal or autumnal equinox as this moment; others, the summer or winter solstice. Astronomers opt for the vernal equinox. The history of the calendar is largely the history of the invention of better methods for detecting the instant of an equinox or solstice and of measuring the length of the year (Richards, 1999: 91-92). Dividing the year according to solstices and equinoxes requires precise knowledge of the position of the sun in relation to the background stars. This is because the solstices and equinoxes are 'housed' within different constellations. This pattern is not directly observable; rather it requires prolonged monitoring of the sky and recording of the changing relationship between the positions of fixed stars and the movement of the sun.

The passage of the seasons is marked by a combination of the changes in the behaviour of the sun and a series of naturally occurring climatic and biological signs (*ibid.*: 30). During the course of a year the sun crosses the equator at the two equinoxes. It rises precisely in the east and sets precisely in the west at these points of the year. Beginning with the spring equinox, the point of the sunrise along the horizon begins to move in a northerly direction (to the left, counter-clockwise); after the summer solstice it returns from the northeast. After the sun has passed through the first point of Aries, or the spring/vernal equinox, it climbs further and further from the equator until it reaches its highest point at the summer solstice (when it is then furthest from the equator). The sun then begins its descent to eventually cross the equator once more at the first point of Libra at the autumnal equinox. It then travels in a southerly direction (to the right, clockwise) and following the winter solstice it begins its return from the southeast. It continues to move south until it reaches its lowest point at the winter solstice, before returning once more to the first point of Aries. At the two solstices it appears to come to a standstill before reversing its motion. At the summer solstice the sun is directly over-head at noon, while at mid-winter it peaks out at a low angle above the southern horizon and casts the longest noontime shadow of the year. The position of the sun when at a solstice is termed a solstitial point (Konakov and Black, 1994: 54; Richards, 1999: 208-229).

2.2.2 The Lunar Cycles and the Month

The lunation period defined by the cycle of phases of the moon is the basis of the month, but the moment when each cycle begins is a matter of convention. It is easy to detect the movement of the moon in the celestial sphere within an hour or so because it moves eastwards faster than the sun. A single cycle of the moon is known a lunation (29 or 30 days) and the average interval between two successive new moons is known as the moons ‘synodic period’ which takes 29.53 days i.e. a lunar month (Richards, 1999: 91). The synodic lunar cycle begins with the ‘new moon’, when the moon is directly between the earth and sun and cannot be seen. As the moon continues in its orbit, the crescent of the new moon appears and then ‘waxes’ (increases in size). When the earth is directly between the moon and sun the full face is illuminated. The moon then begins to ‘wane’ and the crescent decreases in size as the visible portion exposed to the sun diminishes, before eventually disappearing before the cycle begins again (*ibid*.: 34). The phases of the moon (new, waxing, full and waning moon) occur nearly one week apart from each other. The actual length of successive lunations can vary by up to seven hours because of complicated interactions between the moon, earth, sun and (to a lesser extent) other planets. The moon has another cycle, the ‘sidereal period’ defined by how it moves relative to the stars, and the time taken to return to the same part of the celestial sphere. During this cycle the moon moves eastwards with regard to the background stars and returns to its original position after 27.323 days (Richards, 1999: 34; see also Strobel, 2001).

Historically the first appearance of the thin crescent, or less frequently the new or waning moon have been used to mark the start of the lunar calendar months (Kramer, 1963: 91; Richards, 1999: 153; González-García, et al., 2007: 24), with the marking of a new year (or season) beginning/ending variously upon its first appearance before or after a given solstice or equinox. However, Da Silva (2004: 475) has ventured that the rising of the full moon may have been used to mark the beginning of lunar months in prehistoric Europe, arguing that the decidedly observable “cross-over” of the rising sun and rising full moon would have been used to intercalate lunar months with solar years around the solstices and equinoxes. During a rising “cross-over” period the full moon is seen to rise south of the direction in which the sun was observed to rise on the same day. Da Silva (*ibid*.) argues that the timing of these events could have been anticipated through direct observation and monitoring of the changing altitude of the moon on the eastern horizon as the sun was setting on in the west on preceding days. This “cross-over” phenomenon occurs after the mid-winter solstice and “around” the time of the equinoxes.

2.3 Historical Calendars

Having considered the basics of lunar and solar cylical patterning and their relationship with the concepts of seasonal change and the patterned progression of time it is necessary to consider historical calendars and the structural variations that occur before attempting to hypothesize about prehistoric conceptualizations of these principles. Richards (1999: 99-100) classification of calendars into ‘empirical’ and ‘calculated’ forms (Table 2.1) provides a suitable breakdown of the underlying typology, before delving into the intricacies of Eurasian lunar and/or solar calendars.

2.3.1.1 Lunar calendars

It has been argued (see Penprase, 2011: 134) that the first calendars were probably lunar as the moon can be employed to coordinate hunting activities and migrations through the environment. The practice of recording days of a lunar calendar appears to be common throughout the world, examples of which include Native American sun sticks, Mayan wooden calendars (which predate the classical Mayan period), Nicobar Island calendar sticks, and the calendar sticks of Siberian hunters (Marshack and D’Errico, 198:, 494-495). Alexandar Marshack has argued that certain Palaeolithic scratch-marked bones and stones constitute the earliest representations of lunar calendars, with the marks representing a tally of days in the lunar cycle (Marshack and D’Errico, 1989; Richards, 1999: 130; Penprase, 2011: 130-134).

Empirical Calendars	
(a) The start of the months or years is determined by direct observation (b) Number of days in the month and year are fixed; extra days are intercalated when deemed appropriate	
Calculated Calendars	
Calendar Category	**Description**
(a) Lunar	No attempt is made to keep the start of the year in synchrony with the sun, but the months keep in reasonable step with the moon by intercalating days according to a rule
(b) Lunisolar	The months are geared to the moon and extra months are intercalated to keep the year, on average, in synchrony with the sun
(i) astronomical lunisolar	Synchrony with both the moon and the sun attempted, but the start of the month or year is determined by astronomical calculation
(ii) arithmetic lunisolar	Synchrony with both the moon and sun attempted by rule based intercalations; (e.g. the Jewish and the Christian Ecclesiastical Calendars)
(c) Solar	The moon is ignored but the year keeps in step with the sun
(i) astronomical solar	Start of the year is determined by calculated time of an equinox or solstice
(ii) arithmetic solar	The length of the year is adjusted by intercalating days according to precise rules to keep it in synchrony with the sun
(d) Wandering year	The moon and sun are abandoned. Each year contains a fixed number of days

Table 2.1: Classification of calendars into ‘empirical’ and ‘calculated’ forms (adapted from Richards, 1999: 99-100)

2.3.1.2 Lunisolar calendars

Many civilizations invented calendars to match the lunar cycles with the longer solar year (Richards, 1999: 94; Penprase, 2011). The problem with matching the lunar and solar cycles is complicated by the fact that the number of days in the lunar month (29.5333) and solar year (365.2422) are not completely synchronous. One solution was the intermitent introduction, or intercalation, of a thirteenth month into the year; but in various civilisations this method was replaced by the employment of purely arithmetical rules to provide a practical scheme for intercalating the extra month. In order to keep the calendar in step with both the moon and the seasons some societies developed rules based upon simple natural or astronomical phenomena, for example by regulating the counting of lunar moths via the occurrence of the solstices and equinoxes.

2.3.1.3 Solar calendars

Some societies eventually abandoned the use of the moon in the organization of their calendar systems. In such instances the calendars are purely solar, with years lasting variously 365 (e.g. ancient Egyptian wandering year) and 365-366 days with an extra day intercalated every four years (Roman). Where such calendars were in use the equinoxes and solstices would have been important for keeping track of seasonal changes (Richards, 1999: 97).

2.3.2 The Babylonian Calendar

The Babylonians invented the sexagesimal number system during the 3rd millennium BC. Eventually, this number system helped with the recording of detailed astronomical events. Clay tablets, dating to the second half of the 3rd millennium BC, that detail the recording of astronomical events are among the earliest surviving records from the cities of Babylonia. The Babylonian calendar was based on the lunar cycles and was divided into two seasons, the first associated with planting crops, the second with harvesting, each being about six lunar months of alternating length (29 and 30 days respectively). As their cyclical festivals were based upon the seasons and solar year, the calendar can be described as being at least partially as lunisolar in nature. Records indicate that from at least as early as 2400 BC attempts were being made to keep this lunar calendar in step with seasons by intercalating a thirteenth month and by the 8th or 9th century BC the Babylonians were making accurate observations of the heavens, could accurately measure the year and predict eclipses approximately (Hunger and Pingree, 1999; Richards, 1999: 37-38, 146-148; Ben-Dov and Horowitz, 2005: 105). From the 6th century BC Babylonian astronomy and calendrical knowledge began to have influence in India. The Babylonian calendar was used by the Persians during their domination of Babylon after about 380 BC and was described by Meton, who introduced it to the Greeks in Athens. It also spread to Judea and forms the basis of the Hebrew calendar. After the campaigns of Alexander the Great in about 331 BC Babylonian astronomical knowledge also spread to Egypt and it may have reached China (Richards, 1999: 38, 148, 172; Ben-Dov and Horowitz, 2005; Penprase, 2011: 141).

2.3.3 The Indian Calendar

Prior to the arrival of Babalonian knowledge on the Indian subcontinent (India and Pakistan) a locally developed lunisolar calendar already existed. Although evidence for writing across India/Pakistan dates back to the mid-3rd millennium BC, the writing system has not yet been deciphered, so to date we know nothing of the contemporary calendar. Documents detailing the early Vedic calendar, which could date to at least the mid-2nd millennium BC, outline a common year of 360 days with 12 30 day months (augmented by an extra month when required). The equinoxes and solstices were of particular ceremonial importance within this calendar system. The current Indian lunisolar year begins upon the first lunation after the vernal equinox, contains 12 months (each solar month includes a lunar month), with an additional thirteenth month to reconcile it to the seasons. The rules by which the thirteenth month is intercalated resemble the Chinese system. This calendar employs the use of star clusters to help track the passing of lunation and the solar year in a similar manner to the signs of the zodiac. This system probably predates the importation of the zodiac from Babylon and perhaps hints to the existence of a sophisticated lunisolar calendar on the Indian sub-continent prior to Near Eastern influence (Richards, 1999: 172-177; Penprase, 2011: 156).

2.3.4 The Egyptian Calendar

A number of issues surround the nature of the development of Egyptian Calendar and the preciseness of Egyptian chronology (e.g. Ward, 1992; von Bomhard, 1999; Belmonte, 2003; Hornung, et al., 2006). Notwithstanding these issues, it is clear that the early Egyptians developed a lunisolar calendar (before 3500 BC) after they had become dependent on the natural flooding cycle of the Nile known as the ‘inundation’. The beginning of the annual floods coincided closely with (within about a month of) the cyclical ‘heliacal rising’ of the star Sothis (Sirius), i.e. the annual first visibility of the star above the eastern horizon just before sunrise after a period of invisibility. The ‘Sothic’ year started on the date of this star rising. The earliest documentary evidence for this calendar dates to the mid-3rd millennium BC. The calendar incorporated a 360 + 5 day lunisolar year and had the three main 120 day seasons (inundation, cultivation and harvest) which were tied to the agricultural practices of the Nile River valley. The concurrent common year had 12 months, each of which took its name from a festival held in that month. As in other calendrical systems, a thirteenth month was intercalated, in order to synchronize the common year with the Sothic year. The months began on the first day on which the old crescent (waning) moon was no longer visible in the east at dawn. This convention is somewhat unusual as months more commonly began with the first sighting of the new crescent moon. Following the establishment of pyramid building in Egypt a third more regular year known as the 'civil calendar' was developed, but surviving records do not indicate when it was first introduced. Each year of this new calendar contained exactly 365 days and was divided into 12 months, each of 30 days. The excess five days were attached at the end of the year. There was no intercalation, no attempt to keep in step with the moon and the relationship to the solar cycle was primarily of a token nature. It is possible that from about the 4th century BC, there were three calendars in use in Egypt: the original lunisolar calendar which was used for fixing the dates of religious events related to agricultural and seasonal festivals; a new lunar calendar used for religious events related to the moon; and the civil calendar which was used exclusively for administrative purposes (Richards, 1999: 152-155; Penprase, 2011: 137).

2.3.5 The Roman Calendar

The calendar originally used by the Romans is believed to have been lunar, was certainly in place by the first half of the 1st millennium BC and was described by Macrobios and Censorinus, Ovid, and Plutarch. This calendar year began at the vernal/spring equinox and contained 304 days, arranged into 10 months, four with 31 days and six with 30 and ended with December. The status of the remaining period of two months is uncertain (as are other details). Later in 509 BC two additional months were added (one with 29 days, the other 28) to cover the entire solar year, adding up to 355 days with 12 lunar months, with another extra month being added roughly every second year. This system required significant effort to maintain, and often the synchroneity of the lunar months and solar year would slip significantly (Richards, 1999: 207; Steel, 2000: 55; Penprase, 2011: 152).

2.3.6 The Germanic or Teutonic Calendar

The Germanic speaking groups of northern Germany and Scandinavia including the Angles, Saxons, and Vikings are sometimes known collectively as the Teutons (after a tribe who were wiped out by the Romans in 104 BC). The Teutons were responsible for the development of runic script, but its precise origins are uncertain. In 725 AD the venerable Bede described a lunar (arguably lunisolar) calendar used by the Angles. In this calendar the year began at the winter solstice, when the twelve day festival of 'Giuli', or Yule, was celebrated. From time to time (it is not known how often) an additional month was intercalated in the summer. Across the Germanic world the names of the months were variously derived from agricultural events or practices and gods. Arctic latitude calendars are outside the current discussion as year-round lunar observations are impossible as the sun does not set during the summer (Richards, 1999: 203-204; Penprase, 2011: 178-179).

2.3.7 The Celtic Calendar

In his account of his wars in Gaul, Julius Caesar ascribes astronomical knowledge to the Druids, and the Roman historian Pliny the Elder adds a few details, such as the fact their calendar involved a 30-year cycle. It seems that the peoples of northwest Europe began each month, year, and cycle of thirty years with a new moon (Richards, 1999: 199; North, 2008: 232). Two Iron Age calendars were discovered in France during the 19th century AD. In 1802 two fragments of a bronze calendar, believed to date from the 2nd century AD, were unearthed near Lake Antre (Jura). It is believed to depict a lunisolar calendar with alternating months of 29 and 30 days, and two additional months of 30 days which were intercalated every five years (Ruggles, 2005: 76; Zavaroni, 2007: 89-92; North, 2008: 232). The remains of a second bronze calendar, represented by 153 fragments of a shattered tablet measuring 1.5x0.9m (c. 55% of the artefact is missing), were discovered in 1897 at Coligny (Ain). It was a public calendar covering five years, with dates and festivals marked. It is perforated by small holes into which pegs may have been inserted to mark the passage of the days and it appears to divide months into halves (Zavaroni, 2007: 90). It shows a complex pattern of marking the months and days, possibly distinguishing them as favourable and unfavourable and similar distinctions were common throughout the medieval period (Richards, 1999: 199-200; Ruggles, 2005: 75-76).

On the Coligny calendar each day, for a total of five years, is listed and arranged in a scheme with 12 months to the year and an intercalary month inserted every two and a half years, amounting to 1832 days in 62 months. This gives a mean lunation of 29.548 days and a mean year of 366.4 days. Both these averages are longer than the astronomical periods they are designed to represent. It is likely that some adjustments were made to correct these discrepancies every 25 or 30 years. The months are divided into two 'fortnights'. The first always has 15 days and the second 14 or 15 and is headed by 'returning night' ('atenovx'), presumably the fortnight in which the moon wanes. Each 30-day month is designated as being 'good' (matus) and the others 'auspicious' (anmatus) meaning the opposite. Besides these general terms each day is given a number from I to XV and several other abbreviated designations. The latter are believed to relate to schemes for keeping track of the phases of the moon and the solstices. The Celtic year was divided primarily into two halves, marked by Samonios and Giamonios, and four seasons. The first day of each season, apparently falling on the cross-quarter days (the midpoints between the solstices and equinoxes), were signalled by festivals of Imbolc, Beltaine, Lughnasa, and Samhain (Richards, 1999: 199-201) and it appears that these dates are marked at almost exactly quarterly intervals within each year on the calendar. Ruggles (2005: 75) has casts doubt upon this interpretation as the months are lunar, but as noted above, lunar months were often measured with regard to points of the solar year, so it remains somewhat feasible. However, it is likely that the seasonal division of the year, as marked by the equinoxes and solstices, represents an earlier element of the lunisolar calendar than the division at the cross-quarter days (Ruggles, 2005: 75; North, 2008: 232-233).

2.4 Division of the Year into Halves

As noted above the Celtic year was primarily divided into two halves and four seasons (Richards, 1999: 201) and this arrangement is characteristic of many calendrical systems. The astral beginning of the annual seasons most commonly correspond to the four solar phases i.e. the equinoxes and solstices (Konakov and Black, 1994: 48). However, modern folk calendars are primarily based around economic activities which first of all depend on the climate and the natural surroundings. As such, a precise beginning to the "New Year" is often missing from the folk year divisions and as a rule, the partition of the year into periods is somewhat arbitrary or flexible. However, in terms of these being formal divisions historical Christian feast-days are frequently utilized to mark the turning points. Nevertheless, traces of the division of the year into two basic seasons can be found in numerous folk calendars and various European peoples (e.g. Germanic peoples, the Hungarians, Bulgarians, Albanians, Finns, Austrians and Greeks, among others) preserved this tradition until historical times. In temperate Europe the two natural turning periods are spring and autumn and in economic terms these transitions were recognized as changes in nature, by commencement/conclusion of important farming activities, or changes in the activity of animals (Konakov and Black, 1994: 48-50; Pásztor, 2010: 139).

The Sumerians divided the year into two seasons, summer (emesh) beginning in February-March, and winter (enten) beginning in September-October. The New Year possibly fell in April-May and could have been related to the vernal/spring equinox. The months were strictly lunar (so an intercalary month was introduced at regular intervals) and they began with the evening of the new moon and were 29 or 30 days in length. The names of the months, which were derived from agricultural activities or from feasts in honour of certain deities, varied from city to city (Kramer, 1963: 91). The Babylonian calendar also had two seasons, that of planting, and that of harvesting. The Babylonian year began on or after the vernal/spring equinox and there is a suggestion that instead of a year, the Babylonian calendar was structured around a period of six lunar months.

Each new month began on the evening when the crescent of the new moon becomes visible for the first time (Richards, 1999: 147; Kak, 2003: 20). In addition, a second religious calendar based around a winter solstice New Year appears to have been celebrated by both the Sumerians and Babylonians (Kramer, 1963: 140-141; Heinberg, 1993: 83). Within Vedic tradition there were also two concurrent calendars. In one, which appears to have had a primarily religious function, the year was measured from one winter solstice to another; in the other, which has agricultural connections, it was measured from one vernal/spring equinox to another (Kak, 2003: 11), with each New Year beginning with the first lunation after the equinox. A set of 12 solar months (rashi), were observed based on the sun's position within the ecliptic and also included a lunar month (Penprase, 2011: 156).

2.4.1 Winter Solstice Festivals

The Kalash of north-west Pakistan are unique in being the only Indo-European culture that was not absorbed by any of the great religions (i.e. Christianity, Islam, Bhuddism, Hinduism, Zoroastrianism and Jainism). Their winter solstice festival of 'Chaumos' consists of twelve holy days (reminiscent of the Germanic/Scandinavian Yule Festival) interposed by others dedicated to cleaning and preparation. The celebration revolves around three interconnected themes which are common to many ceremonial New-Year celebrations. These are (a) regeneration: of the world as one life-cycle ends and a new one begins, which is common to all ritual New-Year celebrations; (b) fertility: of fields, animals and people, common to many ritual New-Year celebrations; and (c) unification or communion: of people with one another, nature and divinities (Cacopardo and Cacopardo, 1989: 317, 320). These three themes are interwoven into the ceremonies of the festival and it is through the varying forms of unification that both regeneration and fertility are achieved (*ibid*.: 327). The festival involves various hunting rituals, animal sacrifice and feasting (including a meal shared between the dead and the living), ceremonies of purification, processions, leaving and returning, bonfires, dancing, chanting and singing. Role reversal is also evident, as gender roles are inverted during a particular erotic dance. Throughout most of the festival sexual contact is forbidden, but sexual energy (a source of impurity which is repressed) is reintegrated in the realm of the pure and ceremonially unleashed during this dance as men and women sing to and tease each other. However, the sexual prohibitions are not entirely lifted until after New Year and total regeneration has been achieved (*ibid*.: 321-326).

In Ancient Greece the timing of the "New Year" varied greatly, even between colonies and mother-cities. Some cities, such as Thebes, celebrated the New Year at mid-winter, other calendars began around the spring or autumn equinox. Some sources suggest that the Athenian New Year fell ''around the summer solstice'', although this notion is generally incompatible with the suggestion that their year began with the first month starting with a new moon (Richards, 1999: 196; Davidson, 2007: 209). The festival of Poseidōn (who was recorded in the Mycenaean Linear B tablets from Pylos as being the chief deity), was widely celebrated on or near the winter solstice and involved animal sacrifice, feasting, bonfires, procession and dance. Additionally, following separate male and female purification rites there was the “mixing” and the women engaged in lewdness and lascivious teasing (suggestive of role reversal). The rites of the festival were said to rouse Poseidōn the rampant bull and bring the rushing waters to fertilize the fields. This idea is also evident within the wider mythology of Poseidōn as the god of springs and rivers who typically seduced women while they are bathing or drawing water. In addition the ‘Poseidea’ invoked Poseidōn as the god of fresh water who “fructified Dēmētēr’s fields” symbolically linking the deities with the fertility of the land and people (Robertson, 1984: 2, 10, 14-15). Archaeological evidence indicates that ancient sites dedicated to Krónos at such locations as Hera, Olympia, Athens, Attica and Rhodes can be traced to at least 600 BC. Documentary evidence indicates that festivals dedicated to Krónos in Greece were practised on a seasonal basis and included a sort of New Year celebration held at the winter solstice. In Athens for example the associated ceremonies involved elements of role reversal including ‘carnivalesque’ feasts during which masters and slaves ate together or (in some cases) masters served their slaves (Heinberg, 1993: 90; Prendergast, 1999: 176).

In the Roman world the ceremonial cycles dedicated to Saturn were almost identical to the Kronia of Classical Athens. The winter solstice Saturnalia was one of the most well-established and popular festivals of the Roman world and was variously celebrated up until the 3rd and 4th centuries AD. The Saturnalia was central to a set of winter festivals that were celebrated across the winter solstice and into the New Year. The Roman temple of Saturn was established around 497 BC and the pre-existing Solstice celebration was re-dedicated to Saturn in 486 BC. The Etruscan’s celebrated the birth of the sun-god Sol at the winter solstice and this festival was already well-established during the early 1st millennium BC (and probably much earlier). Like the Kronia, the Saturnalia featured gift-exchange, feasting, games and role reversal. Slaves were given temporary liberty to do as they liked and dined before their masters. A mock king who presided over feasts and amusements was also enthroned as part of proceedings. The New Year festival that followed was the Compitalia or Kalends also involved feasting, gift-exchange, masquerade and role reversal (Heinberg, 1993: 90, 92; Prendergast, 1999: 176-177). Another winter solstice focused cult spread to the Roman Empire in the 3rd Century AD (219 AD) was that of the sun-god Deus Sol Invictus which had a Syrian and possibly pre-Jewish Canaanite origin. The cult was disseminated as a cult of the emperorship and the state and was made the dominant religion by

Emperor Aurelian (by 274 AD) and it reached its peak during the reign of Constantine the Great (306-337 AD). The cult's most important celebration was the Dies Natalis Invicti which took place on the 25th of December (Prendergast, 1999: 180).

In Scandinavia the birth of the god Baldur was celebrated at the winter solstice (and his death at the summer solstice).The Germanic/Scandinavian Yule (Danish Jul) may have originally been a Teutonic winter solstice festival. The festival lasted twelve nights and was celebrated with fires, dancing and sacrifices. Historically the fires were believed to promote the return of the Sun, to burn away the accumulated misdeeds of the community and ward off evil spirits (Heinberg, 1993: 83, 94; Richards, 1999: 203; Pásztor, 2010: 139). As in Germaic/Scandinavian tradition at the time of the winter solstice in Vedic India there were concerns that the sun would never start moving again and that the winter would remain forever, so renewal (or regeneration) was central theme. Once renewal was assured the sun became strong again, animals gained renewed fertility and birds new feathers. As recorded in the Rig Veda and the Mahābhārata, Vedic winter solstice and New Year celebrations involved such elements as horse races, staged fights, verbal competitions and sacrifices (Kak, 2002: 20, 55, 2003: 11; Witzel, 2012: 140). The Sumerian New Year was probably celebrated over several days with various acts of feasting and ceremony. The birth or re-birth of the fertility deity Dumuzi (Babylonian Tammuz), was celebrated at the winter solstice (and his death at the summer solstice). The most significant rite of the New Year was the 'holy marriage' (hieros-gamos) between the king, who represented Dumuzi, and one of the priestesses who represented the goddess Inanna, to ensure effectively the fertility and prosperity of Sumer and its people. Dumuzi was a prominent ruler of the city-state of Erech during the early stages of the 3rd millennium B.C., where lnanna (who was primarily responsible for sexual love, fertility, and procreation) was the tutelary deity; And his godly status appears to have been established during the mid-3rd millennium BC, by which time the 'holy marriage' had become enshrined in Sumerian practice (Kramer, 1963: 140-141; Heinberg, 1993: 83).

2.5 Historical calendars as indicators of Prehistoric counterparts

Historical calendars provide a number of clues as to how prehistoric calendars may have been structured. It is clear that these would have needed to integrate seasonal changes, lunisolar patterns, economic activities and a combination of ceremonial or religious concerns. It is evident that the cyclicality of seasonal and lunisolar patterns will have provided the fundamental structuring principles. Natural cycles will have structured agricultural and other economic activities on the one hand and anchored ceremonial or religious festivals on the other. There are some indications that two closely related calendars will have been used in parallel, one with an economic focus, the other ceremonial or religious. The economic calendar is likely to have been divided into two halves with the divisions being marked by either the natural beginning of spring or the vernal equinox and the natural beginning of autumn or the autumnal equinox. There are strong indications that the focus and beginning of the ceremonial or religious calendar will have fallen at the winter solstice and that other important cyclical festivals will have been scheduled to mark important points of the economic calendar and/or additional astronomically defined points of the year. The equinoxes and solstices appear to have been utilized for holding cyclical festivals in many historical calendars. As noted previously the astronomically defined cross-quarter days were utilized for scheduling festivals within the Celtic calendar, but division of the year as marked by the equinoxes and solstices represents an earlier system. Notwithstanding, the cross-quarter days broadly coincide with natural seasonal changes and thus the festival names used in the Celtic calendar provide convenient terms and calendrical points for describing the periods of seasonal change. This is particularly useful because (a) the seasonal cycle is closely associated with changing focuses of activity during the course of economic year; and (b) these implicitly important points of the economic calendar could have been commemorated with ceremonial or religious festivals.

Dates Marking Changes in Solar Year			
Historical Festival	**Dates**	**Interval**	**Additional**
vernal equinox	20 March	mid-spring	day/night equal length
summer solstice	20-23 June	mid-summer	longest day of year
autumnal equinox	22 September	mid-autumn	day/night equal length
winter solstice	21-22 December	mid-winter	shortest day of year
Dates Marking Seasonal Changes			
Historical Festival	**Dates**	**Interval**	**Additional**
Imbolc	2-7 February	beginning of spring	
Bealtaine	4-10 May	beginning of summer	
Lughnasa	3-10 August	beginning of autumn	
Samhain	5-10 November	beginning of winter	'Celtic New Year'

Table 2.2: Dates marking changesin seasons and solar year

2.5.1.1 Cyclical Ceremonial or Religious Calendar

As outlined above the cyclical festivals of prehistoric ceremonial or religious calendars are likely to have been associated with astronomically defined points of the calendrical year and the periods of seasonal change. As such, in terms of the lunisolar calendar, the solstices and equinoxes appear to represent the most plausible times of commemoration. Furthermore, as historical New Year festivals are often placed at the winter solstice, it is feasible that this may have been a particularly important focus of ceremonial activity. The changing of the seasons, which can be at least nominally correlated with the cross-quarter days, represent the other obvious times of year which could have been associated with cyclical commemorations or ceremonial observances.

2.5.1.2 *Seasonal Economic Calendar*

The structure of prehistoric economic calendars will have been closely tied to seasonal changes as natural cycles will have dictated the timing of various agricultural and economic activities. Although some economic tasks will not have been seasonally restricted, activities associated with such pursuits as maritime travel, the exploitation of natural resources, crop cultivation and animal husbandry will have been. Furthermore, these are the activities which will have essentially structured economic calendars. The timing of these various activities will be outlined below and the timing of these activities will be framed in relation to the solstices, equinoxes, solstices and cross-quarter days, which will be employed as a proxy for the changing of the seasons.

2.5.2 Long Distance Travel

Based on monthly river discharge records it appears that Irish rivers will have been most difficult to navigate between December and January and easiest in July. Increased currents within the Irish Sea which will have aided maritime travel between April and October, but are at their peak during the summer months (Hill, et al., 1997: 85-86; Horsburgh, et al., 2000; Wolf, et al., 2002: 109-110; Elliot, et al., 2007: 15) and within the Celtic Sea between May and November (Horsburgh, et al., 1998, 2000: 48; Brown, et al., 2003). Taking these and weather factors into account, it may be advanced that maritime travel around and across the Irish Sea (or further afield to the Continent) would have been easiest to undertake between May and perhaps mid-August, so broadly between Bealtaine (May 4-10) and Lughnasa (August 3-10).

2.5.3 Wild Resources

2.5.3.1 *(a) Marine*

Although there has been much debate (Milner, et al., 2004, 2006; Hedges, 2004; Richards and Schulting, 2006a), carbon and nitrogen isotope analysis of human bone and residue analysis of ceramics does appear to indicate that from the onset on the Neolithic in the British Isles fish and other marine resources were not heavily exploited (Richards, et al., 2003; Richards and Schulting, 2006b; Kador, 2010: 12; Cramp, et al., 2014a). This pattern appears to continue throughout the 3rd millennium BC as the preliminary results of isotopic analysis carried out on Chalcolithic period individuals from across Britain indicates that their general diets excluded significant levels of marine and other aquatic resources (Jay and Richards, 2007; Jay, et al., 2012).

It is possible that during the Neolithic-Early Bronze Age marine resources were exploited at low levels in some areas and these could have included such species as salmon, eels, mussels and oysters. In the spring young salmon travel down-river to the sea. The fish feed in the sea for over a year before returning to the rivers of their youth to spawn in autumn or winter, but mainly in late July-August. If they survive spawning they then move downstream once more to the sea. Whilst it would be possible to catch young salmon in the spring, historically the majority of salmon and other fish were caught on their way upstream in late July and August (Went, 1962-1964: 192; van Wijngaarden-Bakker, 1985: 73-74; O'Sullivan, 1994: 12). Towards the end of their adult lives during the months of September and October, eels begin their journeys to the spawning grounds in the Saragasso Sea in the Atlantic. Historically, eel fishing has taken place during the start of this migration while they travel downstream (van Wijngaarden-Bakker, 1985: 74; O'Sullivan, 1994: 11). In the case of oysters and mussels the prime gathering seasons occur in the autumn and early winter months (Went, 1961; Rodhouse, et al., 1984). If these marine resources were seasonally exploited then it appears that the most likely period occurs between July and early November, suggesting that the season would have begun sometime between the summer solstice (June 23-25) or Lughnasa (August 3-10) and may have ended around or shortly after Samhain (November 5-10).

2.5.3.2 (b) Terrestrial

Occasional hazelnut shells have been recovered from earlier Neolithic (Waddell, 2010, 30; Smyth, 2014: 52, 127) and Late Neolithic-Early Bronze Age occupation features (O'Carroll, 1994; Stevens, 1997; Russell, 2001; Jones, 2003; Kiely, 2006: 55) and burials (Wallace, 1973; Waddell, 1990; Ó Ríordáin and Waddell, 1993; Reilly, 2005). Other wild fruits found on earlier Neolithic sites include sloe seeds, a blackberry seed and an apple pip and core at Ballyharry, Co. Antrim, an apple core from Gortore, Co. Cork, a crab-apple pip from Pepperhill, Co. Cork, and crab-apple pips and charred fragments of dried apples from Tankardstown, Co. Limerick (Waddell, 2010: 30). A trace deposit of blackberries was recorded in an Early Bronze Age grave at Aghnaskeagh, Co. Louth (Evans, 1935; Waddell, 1990: 111; Ó Ríordáin and Waddell, 1993: 119) and apple/pear pips have been recovered from Chalcolithic-early Bronze Age occupation features on occasion (Gleeson, 2004; Kiely, 2006: 55). The height of the season for the collection of fruit, nuts and berries will have been between the beginning of August and the end of September (Costley and Kightly, 1998). As such it is possible that wild food harvesting occurred primarily between Lughnasa (August 3-10) and the autumnal equinox (September 22), but some of these resources would have been available up until at least Samhain (November 5-10).

Honey collection is known to have taken place from as early as the Palaeolithic. On the European continent rock-art representations of honey related activities have been found in Spain. Paintings in a side chamber of the Altamira cave in Valencia, dated to roughly 25 k cal BP, depict honeycomb, bees, and honey collection ladders. In an open-air rock shelter in Bicorp in Valencia, depictions of honey collection, bee swarms, and comb representations, dating to 10 k cal BP, have been found (Crittenden, 2011: 259-260; Crane, 2013: 43-44). Honey residues have been identified in ceramics including Early Neolithic pottery from Runnymede (Surrey) in southern England (Needham, and Evans, 1987) and both bees wax and mead have been identified in Neolithic, Beaker, Chalcolithic non-Beaker and Ciempozuelos style pottery in Iberia (Guerra Doce, 2006b: 249-251; Garrido Pena, et al., 2011: 111). Honey collection would have been possible during the summer and autumn months (Loughton, 2009: 93), so gathering could have been undertaken between Bealtaine (May 4-10) and Samhain (November 5-10).

2.5.3.2.1 Wild boar

Wild boar bones have been found on an Early Neolithic site at Ballycahane Lower, Co. Limerick (Carden, 2012: 14) and an unfused calcaneum which may have come from a young wild boar was found among the Late Neolithic remains at Newgrange (Meath) (van Wijngaarden-Bakker, 1986: 70). Carden (2012: 30) suggests that certain zooarchaeological and genetic data indicates that Irish ‘wild boar’ disappeared during the Mesolithic-Neolithic transition and/or the Neolithic (although she suggests they may have been reintroduced during or after these periods), but ‘boar tusks’ have been found in a number of EBA burials, particularly in association with inhumations (Wilde, 1857-61; Hencken and Movius, 1932-34, 1935: Prendergast, 1963; Waddell, 1970: 118, 121, 127, 133, 1990: 56-58, 93, 101, 123, 126-127, 148-150; Mount and Buckley, 1997; Ó Ríordáin, 2000), suggesting they were probably present until the end of the 3rd millennium BC. Wild boar occurs in low numbers on a Later Mesolithic/Early Neolithic site at Goldcliff East (Monmouthshire) in Wales (Carden, 2012: 19) and in the southern England wild boar have been recognised on five earlier Neolithic sites and nine Late Neolithic-EBA sites (Serjeantson, 2011: 45). Wild boar naturally rut from late October to early November, with sows farrowing in early spring and seasonal reproductive arrest occurs in late summer and early autumn (Gregg, 1988: 119; Love, et al., 1993: 191-192; Peltoniemi, et al., 2000: 173; Ungerfeld and Bielli, 2011: 7). In the medieval period various sources indicate that a closed season was imposed upon wild boar hunting beginning in mid-late September. If preservation of stocks played a significant role in prehistoric hunting strategies, as it did during the medieval period (Almond, 2003: 87-88), based upon animal weight and reduced (male) aggressiveness during (female) reproductive arrest, seasonal boar hunting is most likely to have been undertaken during late summer and early autumn, perhaps being most focused to begin before Lughnasa (August 3-10) and last until shortly after the autumnal equinox (September 22).

2.5.3.2.2 Red Deer

Available evidence indicates that red deer was not present in Ireland during the Mesolithic and was (re-)introduced during the Neolithic. Its presence appears to be confirmed in the Late Neolithic, it being represented at Newgrange and by a number of stray finds including numerous bones (2924-2678 cal. BC) from mud flats of the Fergus Estuary (Clare) and of a near complete stag (2904-2581 cal. BC) from a bog near Castlepollard (Westmeath) (van Wijngaarden-Bakker, 1974: 353-355, 1986: 87-89; McCormick, 2007a: 78, 84; Carden, et al., 2012: 5-9). However, seven antler pins from Carrowmore (Sligo) have produced dates between 3775-3520 and 3305-2950 cal. BC, indicating that either antlers were being imported or deer were already present in Ireland by the mid-4th millennium BC (Bergh and Hensey, 2013: 355, 358). Red deer remains (bones, teeth and antler) were common on many British Mesolithic and Neolithic sites, including some of the islands off Scotland (Carden, et al., 2012: 9). In southern England between the Mesolithic and EBA red deer were commonly the most frequent wild animals present. However, the percentage of sites with red deer declined from Early Neolithic and proportionally were at their fewest during the Beaker period (Serjeantson, 2011: 40-41). Red deer fawning occurs in early summer and in the medieval period there was a closed period on hunting ending fifteen days after the summer solstice (21 June) i.e. lasting until early or mid-July (Almond, 2003: 85-86). Irish tradition and literature suggests an association between seasonal deer hunting and the period surrounding the beginning of harvest or Lughnasa (August 3-10) and it may have been largely centred on the month of August (FitzPatrick, 2012: 116-117; E. FitzPatrick, pers. comm.), a situation certainly not contradicted by other medieval sources concerning the timing of stag (or hart, i.e. male) hunting (Almond, 2003: 86-88). However, red deer hind (female) hunting is certainly known to have taken place during the winter months during the medieval period (*ibid*.).

2.5.4 Crop Cultivation and Harvesting

Evidence for the cultivation of barley (*Hordeum vulgare*) and emmer wheat (*Triticum dicoccon*) comes from a number settlement sites of Late Neolithic and Early Bronze Age date. It may also be notable that einkorn wheat (*Triticum monococcum*) and common/bread wheat (*Triticum aestivum*) are known to have occurred in Irish Neolithic contexts (Waddell, 2010, 30; Smyth, 2014), although it is possible that cultivation of the former may have ceased by the Late Neolithic period. Oats (*Avena sativa*) have been recorded among grains recovered from Early Bronze Age *fulcuht fiadh* at Carrickmines Great (Dublin) (Reilly, 2002) and Boyerstown (Meath) (Clarke, 2006). The latter site produced a date of 2010-1760 cal. BC, suggesting that oats may have been cultivated from around the beginning of the 2nd millennium BC. The possible occurrence of rye (*Secale cereale*) has been noted in at least one Irish Early Bronze Age context, a grave located at

Carmanhall (Dublin) (Reilly, 2005), which could indicate that its cultivation also during the first half of the 2nd millennium BC in Ireland. One of the graves at Carmanhall also contained the remains of a legume/pulse (*Fabaceae*/*Leguminosae*), suggesting that these could have been cultivated during the Early Bronze Age if not the Neolithic. Flax (*Linum usitatissimum*) seeds and oil are also edible and flax is first recorded in Irish pollen diagrams shortly before 2000 BC at Essexford Lough (Louth) (Waddell, 2010: 62) and a possible flax boll probably dating to the Chalcolithic (2458-2151 cal. BC) was recovered from a stone lined pit at Gortroe (Cork) (Kiely, 2006: 55). Based upon historical information (Kelly, 1997: 231, 237; Costley and Kightly, 1998) cultivation activities such as ploughing and sowing are likely to have taken place between mid-February and the end of March, so broadly between Imbolc (February 2-7; the traditional beginning of spring) and the vernal equinox (March 20). The harvesting period is then likely to have occurred between the beginning of August and the end of September, so roughly between Lughnasa (August 3-10) and the autumnal equinox (September 22).

2.5.4.1 Beer Production

Beer is attested to in the earliest written records from Mesopotamia and Egypt (Samuel, 2000: 537-38, 553; Jennings, et al., 2005: 279). Beer residues have been identified in samples of both Early Neolithic and Beaker pottery from numerous Iberian sites and intriguingly, beer residue mixed with a hallucinogen (*hyosciamine*) was identified in a Maritime style Beaker from a sepulchral cave at Calvari d'Amposta (Tarragona). Residues of beer and bees wax were identified in decorated bowl in the Ciempozuelos style from Almenara de Adaja (Valladolid) and two Beaker sherds from La Loma de Tejería (Teruel). Mead has been identified in Neolithic pottery found in the layer below the mound of the Azután megalithic barrow and non-Beaker vessels from a Copper Age cemetery at Valle de las Higueras (Toledo). In addition, samples of Beaker pottery from the Ambrona Valley (Soria) have produced residues of a probable alcoholic beverage made from pear mixed with wheat (Guerra Doce, 2006b: 249-251; Garrido Pena, et al., 2011: 111). In Scotland, residue analysis of a Beaker found in a burial in Ashgrove (Fife) and a Food Vessel from North Mains near Crieff (Perthshire) have also produced evidence of having contained alcoholic beverages (Burl, 1991: 31; Whittington, 1993; O'Flaherty, 1999: 33; Guerra-Doce, 2006b: 248).

Many indigenous alcoholic beverages had a shelf life of less than a week and this is also true of both barley and emmer wheat beer which typically spoiled within seven days (Haggblade and Holzapfel, 2004: 333; Jennings, et al., 2005: 286). Due to the short shelf life of barley and emmer wheat beer all of the alcohol for a gathering or feast would have needed to be produced in the days preceding each event. Barley and emmer wheat beer took 8-14 days to make and it would not have been possible to produce two successive batches of beer for an event using the same equipment because the first batch would have spoiled before the second batch had finished fermenting. As such, everything necessary for brewing would need to be regionally available during the weeks preceding a commensal event (Jennings, et al., 2005: 286).

Grains used for brewing are available for harvest for only a few weeks each year, and annual yields can vary considerably. Alcohol production rates, in the absence of grain storage, would therefore also fluctuate substantially from one year to the next as beer production was interlinked with the success of the grain harvest (Jennings, et al., 2005: 287; Loughton, 2009: 92). Furthermore, in many societies beer production may have been confined or been more frequent following the harvest as has been demonstrated ethnographically (Dietler, 2001: 79-81; Dietler and Herbich, 2001: 2452-47; Junker, 2001: 271-274; Loughton, 2009: 92-93). The production of mead during prehistory would also have been seasonal given that honey was only available during the summer and autumn (Loughton, 2009: 93). Barley and emmer wheat can be stored in different forms during different stages of alcohol production. Depending on conditions, these cereals could be stored for well over a year in granaries or pits, malted and unmalted flour could be stored for a few months, and mash could be stored in jars for adding to subsequent brews (Murray, 2000: 527-528; Samuel, 2000: 555; Jennings, et al., 2005, 287). However, chances of spoilage increases as the grains became more processed, for example, flour generally becomes rancid quickly if temperature and humidity are not carefully controlled (Jennings, et al., 2005: 287). Notwithstanding these potential pitfalls, due to the storability of processed grains the labour demands of brewing could also be spread out over a number of months as harvesting, malting, grinding, and milling, can be undertaken long before brewing and fermentation, which would occur in the weeks immediately preceding gatherings (Samuel, 2000: 559-563; Jennings, et al., 2005: 287). The transportability of these grains, combined with their storability, would have facilitated 'centralized' production close to the place of consumption (due to beverages' short shelf life), from multiple harvests from a wide area, water and fuel sources permitting (Jennings, et al., 2005: 288).

2.5.5 Domestic Animals and Reproduction Patterns

The primary domestic animals introduced to Ireland during the Neolithic were cattle, pigs and caprovine (sheep and goats). There are some indications that in most locations cattle and/or pigs were most prevalent during the Neolithic-Early Bronze Age. The relative dearth of faunal material means that only limited conclusions can be drawn about the relative importance of these various species overall. Nevertheless, there would appear to be some indications that cattle may have been the most common domestic animals in the earlier Neolithic with pigs gaining increasing importance during the first half of the 3rd millennium BC. It appears that cattle continued to predominate in most locations throughout the Bronze Age, but high representations of sheep have been recorded at some sites dating to the second half of the 2nd millennium BC in the southern half of the country (Woodman, et al., 1997; McCormick, 2007a; Waddell, 2010: 127, 219, 224, 226).

Across the Irish Sea in Britain similar patterns appear to exist, but some differences are also apparent. In southern England during the 4th millennium BC the proportion of cattle is consistently high, but the proportion of pigs overtakes that of cattle during the first half of the 3rd millennium BC. However, cattle become the most prominent animal once again during the Chalcolithic. In the Early Bronze Age the relative numbers of cattle declined and there was a marked increase in the relative importance of sheep, but it appears that pig-keeping was almost abandoned. Goats in contrast to the other species appear to have only been kept in small numbers throughout the period (Figure 4.1; Serjeantson, 2011: 14-31; Allen and Maltby, 2012: 288-291). Other parts of Britain appear to show some regional variations to some of these patterns. For example, in the Western Isles of Scotland numbers of cattle and sheep appear to have been roughly equal and pigs absent during the earlier Neolithic and this may also have been the case at the Knap of Howar, in Orkney (Noddle, 1983; Darvill, 2010: 89). Additionally, the increased importance of pig witnessed in southern England during the Late Neolithic appears to continue into the second half of the 3rd millennium BC in more northerly areas, as the relative numbers of cattle and sheep were surpassed by pigs at many sites in the midlands and northern parts of England (Darvill, 2010: 89, 174-175; Allen and Maltby, 2012: 291-292).

Seasonal reproduction is common in most modern temperate sheep breeds (seasonality is very weak or does not exist at all in breeds originated near the Equator, i.e., most hair sheep breeds). For most European breeds reproduction occurs in late summer and autumn (Ungerfeld and Bielli, 2011: 6-7). Based upon a 145 day reproductive cycle this would appear to indicate that if spring lambing, i.e. roughly between Imbolc (the beginning of spring) and the vernal equinox during February-March, was preferable then the breeding season would have occurred between the autumnal equinox (September 22) and Samhain (November 5-10).

Goats have similar breeding patterns to those of sheep, with the breeding season occurring in autumn and winter in temperate regions (Ungerfeld and Bielli, 2011: 7). If kidding was intended to occur between Imbolc (the beginning of spring) and the vernal equinox during February-March, then breeding would have occurred roughly between the autumnal equinox (September 22) and Samhain (November 5-10) based on a 150 day gestation period.

Modern cattle breeds originating in temperate areas are normally not seasonal breeders. However, evidence indicates that ancestral species of domestic cattle were seasonal breeders, and even today cows living in very high latitudes still breed seasonally, with calving concentrating in spring (Borisenkov, et al., 2004; Ungerfeld and Bielli, 2011: 7). Cows mature at about two and a half years old and they will then calve virtually every year for five or six years after that (Green, 2002: 33). Based upon the gestation period of 238 days for cows, in order to clave cattle in spring (April-mid May) the breeding season would occur between the summer solstice (June 23-25) and Lughnasa (August 3-10).

Domestic pig ancestors, the European wild boar, are seasonal breeders usually producing only one litter per year farrowed in the spring (Gregg, 1988: 119; Love, et al., 1993: 191; Peltoniemi, et al., 2000: 173; Ungerfeld and Bielli, 2011: 7). Although capable of producing piglets throughout the year, the domestic sow shows a reduction in fertility in late summer and early autumn, which coincides with the period when the European wild boar is in seasonal reproductive arrest (Love, et al., 1993: 191-192; Peltoniemi, et al., 2000: 173). In the domestic pig during the summer these seasonal variations include decreased sperm counts and libido in boars, and periods of infertility and late pregnancy loss in both sows and gilts. Additionally, during summer and early autumn periods of early pregnancy disruption are frequent. However, seasonal breeding patterns of domestic pigs are more flexible and they can normally breed throughout the year if food and housing are adequate (Ungerfeld and Bielli, 2011: 7-8). From the standpoint of understanding prehistoric domestic pig breeding patterns it is important to note that on the one hand feral pigs adapt easily to seasonal breeding (*ibid*..: 7) and on the other it is possible to take the wild pig producing one litter a year and convert her to a sow producing two (or more in modern times) litters per year simply by management practices used with domestic pigs (Love, et al., 1993: 192). Thus, it is fairly safe to say that after a prehistoric domestic sow was 2 years old it was fully capable of producing two litters a year, although more commonly three litters in 2 years, as obtaining two litters a year from all the sows in the herd is practically impossible (Russell and Zeller, 1958: 19, 30).

Pigs naturally rut from late October to early November, the commencement of which is largely influenced by food availability, gestation lasts four months and sows farrow in early spring. The average sow probably raised half a dozen piglets a year. Weaning is a gradual process and lactation continues for 2-4 months until mid-July, during which the sow remains in anoestrus, a state which continues after weaning until the next rut. If a (modern) domestic sow is in good condition, she will come into oestrus three or four days after the piglets are weaned and may be rebred immediately. Wild sows can produce two litters per year if lactation is terminated by removal or death of the litters before mid-summer. However, sows weaning a litter after the summer solstice are unlikely to come into oestrus and will remain in anoestrus until late autumn (Russell and Zeller, 1958: 30; Gregg, 1988: 119; Love, et al., 1993: 192). Litter sizes vary, usually consisting of 5 or 6, but up to 13 piglets. Sows usually farrow for the first time when they are one year old, and they can continue to breed for six to eight years (Russell and Zeller, 1958: 19, 30; Gregg, 1988: 119). The system was much the same in medieval Europe, when two litters a year were regarded as normal, with seven piglets in each litter. In terms of understanding prehistoric pig farming practices it is perhaps important to note that Roman and medieval farmers kept many half-wild pigs in mountain forests, which were rounded up as necessary, in addition to sty pigs (Baker, 1985: 34-35).

2.5.5.1 Milk

Residue analysis carried on ceramics has established that dairying and milk consumption was established in the Near East and spread across Europe as part of the 'Neolithic package' (Craig, et al. 2003; Vigne and Helmer, 2007; Duerr, 2007; Evershed, et al. 2008; Greenfield, 2010). Lipid residue studies also indicate that milk and dairy products continued to be consumed in the British Isles throughout the earlier Neolithic and during the 3rd millennium BC in both Grooved Ware and Beaker pottery associated contexts (Dudd, et al., 1999; Parker Pearson, et al., 2011: 86; Cramp, et al., 2014b).

Cattle were probably the primary milk producers, although it could also have been obtained from sheep or goats. Sheep give a poor milk yield relative to goats, but the latter are less easily kept in a temperate climate (Green, 2002: 32-33). After maturation cows give their maximum yields when they are between 7 and 10 years old. Dexter cattle, the smallest modern European breed which originates in Ireland, give an adequate milk supply even when fed on relatively poor pasture, a trait that may have been important to prehistoric farmers. The Dexter's prehistoric equivalents may have shared this feature, but these cattle are likely to have given milk for only a short time after calving (Dexter cattle lactate for c. 10 months). In order to exploit cows' milk, then either the calves could be weaned early or they could have been culled for meat (*ibid*.: 33). As lambs are naturally weaned at 3 weeks and milk production lasts up to 10 weeks (note: c. 75% of milk is produced in first 8 weeks) it may be suggested that sheep milk would have been available for collection roughly between the vernal equinox (March 20) and Bealtaine (May 4-10). Based upon the cattle breeding pattern outlined above (and a minimum 3 month weaning age for calves), it is likely that cows were available for milking roughly between the beginning of summer Bealtaine (May 4-10) and Lughnasa (August 3-10). It is perhaps notable that these dates fit with the traditional cattle dairying period in Ireland, but historically the milking of sheep began slightly earlier, commencing after Imbolc (February2-7) (Kelly, 1997: 41, 460; Costley and Kightly, 1998). The variation in the commencement of sheep milking season may be explained by changes in sheep breeds and potentially farming practices between the prehistoric and medieval periods.

2.5.5.2 Wool

The collection of wool from sheep during the Neolithic-Early Bronze Age is likely to have taken place in the Spring-Summer. This may be postulated as soay sheep (*Ovis aries*), which are found on St. Kilda off the north-west coast of Scotland, are a modern relative of the primitive Neolithic/Bronze Age sheep and moult naturally (males shed earlier and more quickly than females) between April and June (Ryder, 1984; Clutton-Brock and Pemberton, 2004: 25-29). If wool plucking was undertaken, this would have needed to be undertaken just before it was rubbed off naturally (Green, 2002: 31). Based upon an April-June moulting period, it may be advanced that wool plucking is likely to have been carried out broadly between the vernal equinox (March 20) and the mid-summer solstice (June 20-23).

2.6 The Economic Calendar and the Winter Solstice

Evidence would appear to indicate that during the period between mid-late November, by which time preparations for the winter may have finished, and mid-January when arrangements for the beginning of the upcoming agricultural season may have been initiated, no essential economic activities are likely to have been taking place. As such, from a purely economic perspective the mid-winter period represents (a) the most convenient time to bring large numbers of people from different parts of the landscape and different regions together; and (b) an ideal time to share and re-distribute resources among and between communities. Further aspects of the potentially close relationship between animal husbandry and calendrically scheduled festivals and particularly the winter solstice is outlined below.

2.6.1 Animal Husbandry and Calendrically Scheduled Feasts

Feasts bring people together socially and promote integration through the communal exchange and sharing of food. This integrative aspect of feasting can have significant social and economic consequences as it can be an important mechanism for redistributing food among community members. Feasting can thus be instrumental in promoting economic and social interdependence among community members. Many within-group feasts have the principal effect of facilitating social integration or redistributing food among households within a community. Feasts of this type are usually financed by multiple households (often anonymously) and tend to be relatively non-competitive in nature, which tends to limit the quantity of resources mobilized. In contrast,

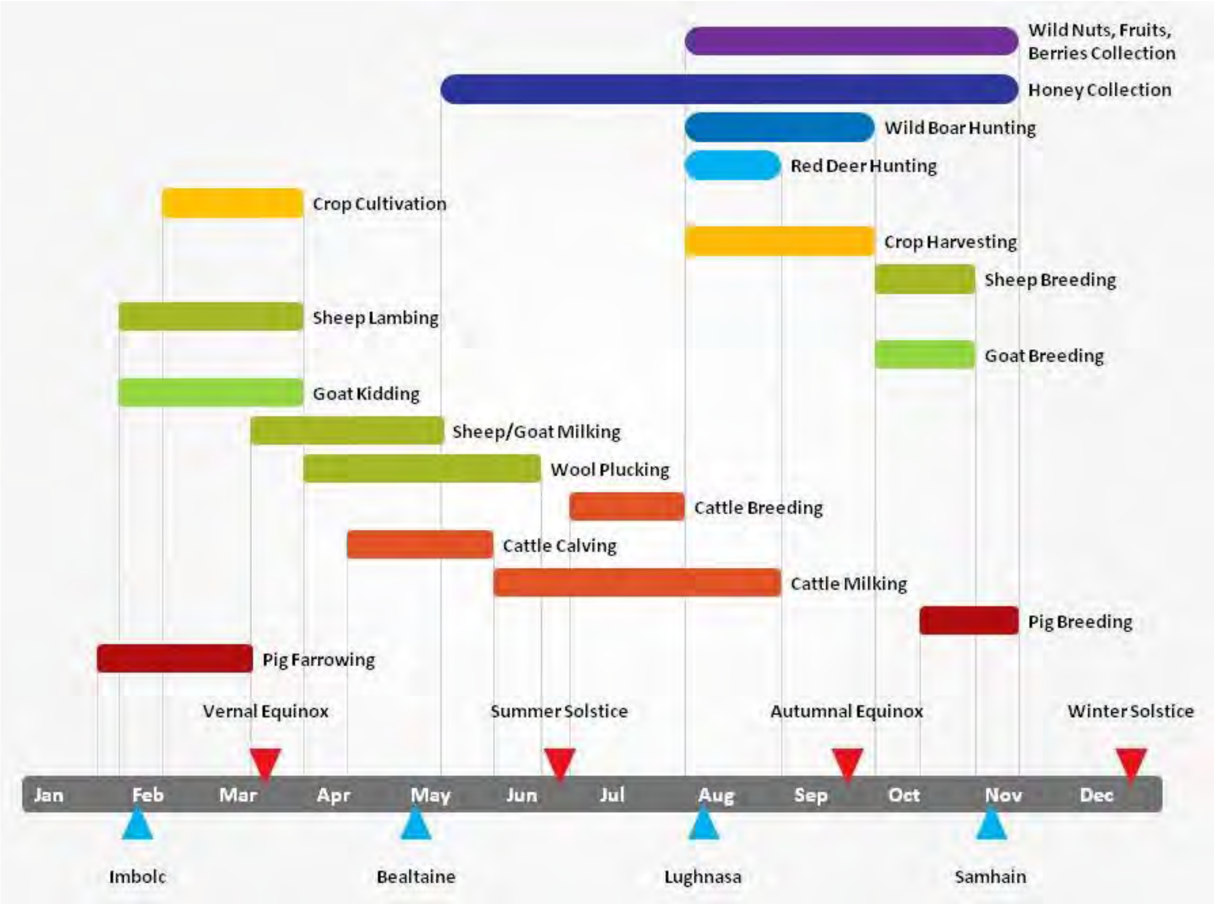

Figure 2.1: Proposed structure of the economic calendar

inter-community (or large-scale) feasts heighten cooperative efforts within the individual communities involved, which often facilitates the financing of larger and more elaborate feasts (Potter, 2000: 472, 474). Meat is frequently the dominant food at feasts, and large animals in particular are commonly consumed as their suitability as feasting food is multifaceted. Large animals supply copious amounts of meat, which is an inherently prized food in most traditional small-scale agricultural societies. The ceremonial distribution of this valued good is an effective strategy for converting material storage (which is only good for a set period of time) to social storage (which lasts longer). The slaughter of large animals also represents significant expense and their consumption intrinsically signals the importance of an occasion. Theoretically, the larger the maximum-sized animal(s) consumed at an event the larger the feast, a relationship which appears to be generally supported by empirical observation (Hayden, 2001: 49; Twiss, 2008: 423).

It has been advanced (Spielmann, 2002: 197) that the food consumed at feasts is not simply surplus left over after domestic consumption needs are met, nor necessarily derived from the normal surplus embedded in subsistence-level production. In fact, traditional farmers and pastoralists rarely consume their livestock except on special occasions or for feasting activities. Moreover, the cost of maintaining enough domestic animals to provide meat as a dietary staple would be prohibitive in most societies (Hayden, 1990: 41; Keswani, 1994: 257). Consequently, it may be advanced that in many (pre-state) prehistoric societies subsistence, and particularly animal husbandry, practices were structured principally by various social and symbolic concerns. As such, a link between agricultural intensification and the requirements of communal commensality, ceremonial practices and related social exchanges is common (Keswani, 1994: 261-262). A heightened relationship between animal husbandry (and agricultural) practices and commensal activities emerges in societies within which consumption events, i.e. gatherings and ceremonies, are calendrically scheduled. The overwhelming or exclusive utilization of domestic, rather than wild animals in many societies for such scheduled activities is due to predictable availability (Marshall and Hildebrand, 2002: 103-104). The need for periodic access to calculable quantities of meat and other consumables for calendrically scheduled events both necessitates and allows for strategic planning from year to year and the targeted intensification of subsistence activities when required (Spielmann, 2002: 197). The scheduling of feasts associated with rites-of-passage, such as weddings and initiation rites, and life-crisis events, such as mourning ceremonies, may not necessarily be "regulated" to the same degree as feasts connected with cyclical calendrically scheduled events. Mourning rites, which are prime aggrandizing events in various parts of North America and Melanesia, can take place months or years after a death, allowing the necessary food and goods to be accumulated. Similarly, initiation rites may be postponed until there are enough initiates, but they can be highly regulated in the sense that they occur at regular intervals. Moreover, the feasibility of these "ad hoc" feasts to act as aggrandizing vehicles may be restricted by the potential of the subsistence economy to generate a surplus. In fact, societies with seasonally structured subsistence abundances may be largely restricted to cyclical feasting practices (Potter, 2000: 474).

The specific choice of rearing domestic animals for communal consumption events is ethnographically attested in numerous locations. For instance, in Asia, Akha feasts include meat, but their daily meals are mostly plant-based (Clarke, 2001: 151; Dietler, 2001: 89, 95; Twiss, 2008: 422). Other examples include various Melanesian groups who raise pigs exclusively for communal consumption events and associated exchanges (Keswani, 1994: 257-258; Spielmann, 2002: 197; Twiss, 2008: 422) and the Piik ap Oom Okiek in Kenya whose household meat consumption derives predominantly from wild animals, but domestic sheep, goat, and cattle are consumed exclusively at ceremonies and gatherings (Marshall, and Hildebrand, 2002). Although the predictable availability of wild resources is generally less stable from year to year than that of domestic resources this is not to say that the management and intensification of subsistence activities related to the procurement of wild animals and fish does not occur in the context of preparing for scheduled consumption events. Such strategies may be as simple as placing periodic restrictions on exploiting fishing, hunting, and gathering areas so that reserves can build up to harvest for the event (Spielmann, 2002: 197). Ethnographic examples indicate that various strategies for obtaining and managing wild resources to provide sufficient volumes of food for regularly scheduled feasts may be employed. For instance in the southwestern United States Puebloan groups hold communal rabbit hunts specifically to provide food for feasting (Potter 2000: 477), the Conibo-Shipibo of the Peruvian Amazon capture, pen, and feed manatees, peccaries, and monkeys in preparation for feasts (DeBoer, 2001: 218), and in the Mt. Williams area of southern Australia, artificial drainage systems are constructed to capture eels for gatherings and ceremonies (Lourandos, 1997: 65, 77).

Although not exclusively, calendrically scheduled feasts and communal gatherings often serve as means to reduce subsistence risks by creating “mutual-support networks” which mediate the redistribution of the surpluses created to accommodate them (Adams, 2004: 57; Hayden, 2009: 599-600; McCorriston, 2011; Moritz, et al., 2011). These reciprocal networks allow the participating groups to cope with periods of subsistence hardship and socioeconomic calamities (Hayden, 2009: 599). Moritz, et al. (2011) have identified three broad, yet overlapping, patterns in social risk-management strategy: (a) exchange networks, (b) patron–client relations, and (c) the absence of institutional strategies (i.e. social support strategies that are limited to residential groups and are not recognized in cultural concepts). In the current context and from an ethnographic perspective it may be most notable that exchange networks are found among African agri-pastoral and pastoral groups (WoDaaBe, nomadic FulBe + Pokot + Maasai, agropastoral FulBe) which do not have major economic differentiation, and rely on cattle as their key economic animal. In these societies, individual households that lose their animals can stay in the pastoral society, because they are given or are loaned animals by other households, transactions which are often performed within the parameters provided by the pre-existing livestock exchange strategies, at the heart of which are, as suggested above, communal feasting activities. As indicated by ethnographic evidence, from such locations as Melanesia (Keswani, 1994: 257-258), the redistribution of domestic animals at communal feasting events may take a number of forms. Butchered meat may be both cooked and consumed at the time of the feast and (potentially preserved e.g. cured or smoked) portions taken away for further redistribution and later consumption. Additionally, feasts frequently provide a platform for the exchange and/or distribution of live animals to be reinvested on future occasions (Keswani, 1994: 257-258; Dabney, et al., 2004: 213), a strategy which would also serve to help maintain genetic diversity among domestic animal populations. Thus, it is apparent that the distribution of meat and live animals during communal gatherings for later consumption serve an integral role in providing short-term food surpluses which reduce or eliminate subsistence hardship, and in sustaining animal populations which ensures the continuing future availability of meat.

2.7 Monument Orientations and Calendars

Aside from astronomical targets a monument's particular orientation may not have mattered much to the builders, or they could target an important landscape feature or location, a structure, monument or complex or even a sacred object (Pásztor and Roslund, 1997: 232). From a calendrical standpoint the identification of alignments which demonstrate connections with calendar turning points are not essential to confirm the existence of such systems as their utilization would not have been dependant on monumental alignments. Repudiation based upon an absence of alignments is misguided, but from a theoretical perspective their existence can nevertheless be informative and advance understandings of the systems utilized.

2.7.1 Western Continental Europe

The majority of the megalithic (and related) tombs of Iberia and Southern France appear to have been constructed during the course of the 4th and 3rd millennia BC. In general terms the overwhelming majority of these faced between easterly and southerly directions. Most are orientated in directions witin the range of sun/moon-rise and sun/moon culmination above the horizon, and tombs facing north of this range are extremely rare. Westerly orientations are relatively rare outside southern France and north-east Spain and in these regions the custom developed during the 3rd millennium BC (Hoskin, 2002: 75, 81-82). In Portugal tombs faced sunrise (Hoskin, et al., 1995b; Hoskin and Aparicio, 1999; Hoskin, 2001, 2002: 76-79), but elsewhere in Iberia (Hoskin, et al., 1994, 1995a; Hoskin, 1998, 2001; Hoskin and Perez, 1998; Gómez Ruiz and Hoskin, 2000), and Southern France along the Pyrenees, the Causses and Loire Valley (Chevalier, 1999; González-García, et al., 2007; Hoskin, 2010: 168-169), although tombs faced easterly and the majority within the sun/moon-rise range, some orientations are south of the sun/moon-rise range. The custom of western orientation is believed to have emerged at Fontvieille in Southern France (Hoskin, 2006; Hoskins, 2010: 169-170; Saletta, 2011) subsequently spreading along the coastal regions to the east and west (Hoskin, 2002: 79-81, 2006: 419-420, 2010: 170-171) and into both the French Basque region and Cataluña where there was a pre-existing tradition of eastern orientation (Hoskin, 1998: 41-44; Hoskin and Perez, 1998; Chevalier, 1999). In a similar fashion the megaliths located in extreme south-west of France display a combination of easterly and westerly orientations, where influences were arriving from both Cataluña and Languedoc (Iund, 2002). The orientation pattern of megaliths in Northern France, dating to between the late 5th and 3rd millennia BC, is not dissimilar to that found in South-Western Europe. Again the majority of the tombs (of all types) are aligned within, or south of, the sun/moon-rise range. This pattern is followed, almost without exception in the Loire, in southern and eastern Brittany, and the Channel Islands, but there are numerous monuments in northern and western Brittany which have western, and in rare instances, northerly orientations (Hoskin, 2003, 2007a, 2007b, 2010: 168; Gonzalez-Garcia, and Ferrer, 2007: 33).

2.7.2 Tricherrandbecher or Funnel Beaker (TRB) Culture Passage Tombs

To date the orientation patterns of the passage tombs of the Tricherrandbecher or Funnel Beaker (TRB) Culture of central and northern Europe, broadly dated to c. 3400/3350-2850/2800 BC, have been analysed in a much more nuanced manner than the megaliths of France, Iberia or the British isles. The TRB is sub-divided into Western, Eastern and Northern sub-regions and the earliest dates have been recorded in TRB North (see Gonzalez-Garcia, and Ferrer, 2007).

In TRB West (northern Netherlands and western Germany) and TRB East (North Germany and Poland) the chambers are the most prominent features and are thus regarded as indicating the primary orientations of the monuments rather than the entrances/passages (González-García and Costa Ferrer, 2006a, 2007). In both regions monuments with east-west oriented chambers entrances are predominantly on the southern sides (exceptions among the Dutch 'Hunebedden') (Iwaniszewski, 1997; Pásztor and Roslund, 1997; González-García and Costa Ferrer, 2003a, 2003b, 2006a) and those in TRB West with chambers oriented north-south the entrances are always to the eastern side (González-García and Costa Ferrer, 2003a, 2003b, 2006a). Within the overall pattern of TRB West and East chamber orientations, peaks at the 90° and 70° azimuths occur in both areas, with a less pronounced peak occurring around the 50° azimuth evident in Lower Saxony and the Netherlands, and another a local peak occurs at the 55° azimuth in northern Germany (Hamel, 1985; Iwaniszewski 1997; Pásztor and Roslund 1997; González-García and Costa Ferrer, 2003a, 2003b, 2006a, 2006b, 2007). Measurements have also been obtained for passages from TRB West megaliths. Among these alignments two main azimuth peaks close to 180° and 150°, and two declination peaks close to 0° and 10° have been noted (González-García, and Costa Ferrer, 2006b). In addition, a strong local peak involving a declination of -35° and azimuth 53°, has been recorded among the Dutch Hunebedden (González-García, and Costa Ferrer, 2007).

The passage tombs of the TRB North area (Denmark and southern Sweden) differ structurally from those of the two more southerly areas as the most prominent architectural features are the long passages. Thus, the passage orientations are considered to have represented the primary 'direction' of the monuments (González-García and Costa Ferrer, 2006a, 2007). Within overall passage orientation pattern in TRB North peak at 90° is evident, but there is no peak at 70° or at the perpendicular of 160°. The most prominent peak is at 125° and there is a secondary peak at 145°, perpendicular to the 55° peak in northern Germany (Hårdh and Roslund 1991; Tilley, 1999: 13; González-García and Ferrer, 2006a, 2007; Henrikson, 2007). In Denmark the peaks around 90° and 125° are clearly visible, but a number of local peaks are also evident around 100°, 121°, 150° and 180° (Clausen, et al., 2008, 2011).

TRB West		
Structure	**Orientation**	**Alignment**
Chambers	main peak 90° azimuth	Equinox sunrises and/or rising full moon near equinoxes
Chambers	secondary peak 70° azimuth	sunrise around one month before/after equinoxes and/or rising full moon one month before/after equinoxes, close to the end of October/beginning of November and February
Chambers	less distinct peak 50° azimuth	summer solstice sunrise and/or winter solstice sunset
Passages	peak c. 180° azimuth, 0° declination	summer full moon or summer eclipses sun near the equinoxes
Passages	peak c. 150° azimuth 10° declination	close to the southern major lunar standstill sun one month before/after the equinoxes
Passages	local peak 53° azimuth, -35°declination	Southern Cross or the Pointers (Alpha and Beta Centauri)
TRB East		
Structure	**Orientation**	**Alignment**
Chambers	main peak 90° azimuth	Equinox sunrises and/or rising full moon near equinoxes
Chambers	secondary peak 70° azimuth	sunrise around one month before/after equinoxes and/or rising full moon one month before/after equinoxes, close to the end of October/beginning of November and February
Chambers	local Dutch peak 55° azimuth	solar or lunar extremes
TRB North		
Structure	**Orientation**	**Alignment**
Passages	Main peak 125°	close to winter solstice sunrise
Passages	secondary peak 145° azimuth	solar or lunar extremes
Passages	secondary peak 90° azimuth	Equinox sunrises and/or rising full moon near equinoxes
Passages	local Danish peak 100° azimuth	sunrise beginning of April and/or middle of September
Passages	local Danish peak 121° azimuth	southern minor lunar standstill and/or sunrise close to end October/early November and February
Passages	local Danish peak 180° azimuth	summer full moon or summer eclipses
Passages	local Zealand peak 150° azimuth	close to the southern major lunar standstill

Table 2.3:Summary of regional TRB passage tomb orientations

The potential astronomical significance of these orientation peaks (as outlined in the papers referenced) has been summarized in Table 2.3. With some regional variation the overall TRB pattern clearly includes alignment peaks connected with calendrical concerns within a system integrating lunar months and solar years. These include: (a) the equinox sunrises and/or the rising full moon near the equinoxes; (b) the rising full moon one month before or after the equinoxes, close to the end of October or beginning of November and early February; (c) sunrise close to the end of October or early November and early February; (d) sunrise at summer solstice or winter solstice sunset; and (e) winter solstice sunrise. In addition, from a calendrical standpoint it is also notable that it has been advanced (Clausen, et al., 2008, 2011) that conjunction the 121° and the smaller 150° peaks in Denmark could indicate a concern with calculating the 18.61-year lunar cycle.

2.7.3 Orientation Patterns in the British Isles

In general terms orientation towards sunrise (or sun/moon-rise and sun/moon culmination above the horizon) between the summer and winter, is evident among the ‘long mounds’ of the British Isles. In Ireland court tombs generally display a wide array of orientations, but the majority of single court tombs face between north-east and east-north-east (and there is a more general eastern preference) and some dual-court tombs display an emphasis towards the east (De Valera, 1959: 29-30). East-west orientation is common among British earlier Neolithic ‘long mounds’. The vast majority of the Cotswold-Servern tombs and non-megalithic long-barrows with known orientations are aligned between north-east and south-east, with a significant proportion being east-west (Powell, et al., 1969; Kinnes, 1992: 68; Lynch, 1997: 25). There are examples of other British monument types having solstical alignments. For instance, the Dorset Cursus (Dorset) and Dorchester Cursus (Oxfordshire), are orientated on the mid-winter sunset and mid-summer sunrise respectively (Barrett, et al., 1991: 50-51; Bradley and Chambers, 1988: 286-287). A number of monuments with winter/summer solstice alignments occur within the Stonehenge and Durrington Walls complexes (Wiltshire) (Parker Pearson, 2007: 130, 133, Parker Pearson, et al., 2006: 234-235, 239, 2007: 630), monuments within the Thornborough complex (Yorkshire) are aligned on mid-winter sunrise (Harding, et al., 2006) and in northern Scotland the largest and most elaborate Orcadian passage tomb at Maes Howe is aligned upon winter solstice sunset (Mackie, 1997).

2.7.3.1 Orientation Patterns of Irish(-Type) Passage Tombs

Prendergast (2008: 6-7) divided the orientations of Irish passage tombs (128 monuments measured) into five (preliminary) categories, but overall, the particulars of the alignments he has recorded have not been disclosed, so a methodical consideration of alignment patterning is not possible. Furthermore, the potential significance of his ‘Category 4’ alignments (60), which represent the majority of the sample, were yet to be determined (*ibid*.). His ‘Category 1’ alignments (39) are “, either on other prominent passage tombs or hilltop cairns” and ‘Category 5’ (4) are interpreted as orientated to both astronomically “interesting” declinations and a tomb or cairn (*ibid*. 6-9). Whether these alignments can in fact be categorized as being orientated towards other monuments is questionable for a number of reasons, but it is clear that in some instances, such as the major complexes at Carrowmore, Co. Sligo (Bergh, 1995) and Knowth, Co. Meath (Eogan, 1986), chronologies show this to be an analytical rather than archaeological concept, as the “focal monuments” (Cooney, 1990) were constructed after those orientated towards them. Rather than being aligned towards monuments these tombs were directed towards areas of elevated ground upon which monuments were constructed at a later stage. Thus, it may be argued that without a detailed chronology for all the sites included in Prendergast’s Categories 1 and 5 should only be deemed alignments that involved heights, which are likely to have been ideologically important. For example, it is suggested that the Slieve Gullion passage tomb was orientated towards the Loughcrew complex (McMann, 1994: 43). Although in this instance it is possible that there were monuments on the hills in Meath before the construction of that in Armagh, it may be more appropriate to state that the orientation of the Slieve Gullion monument was towards the Carnbane Hills, the highest in Co. Meath. In this context it is notable that there are regions, such as those surrounding Croagh Patrick, Co. Mayo (Corlett, 1998a) and the Great Sugar Loaf, Co. Wicklow (Corlett, 1998b), where monuments from multiple periods (including the Neolithic and Bronze Age) were aligned upon significant heights. Furthermore, passage tombs were commonly sited on hilltops (e.g. Hensey, 2010: Type B and C; O'Sullivan and Downey, 2011), so it is not surprising that they are present on locally or regionally significant heights that monuments were orientated towards. Clearly, there must be further reconsideration of the idea that some Irish passage tombs were orientated towards cairns or passage tombs and this should be considered as a wholly separately issue to that of passage tomb location intervisibility (see Cooney, 1990; Fraser, 1998; Prendergast, 2008: 5), which may have more socially connected connotations.

Prendergast (2008: 6-7) considers his ‘Category 2’ (21) as having “potentially significant” solar alignments (i.e. sunrise or sunset) and ‘Category 3’ (4) as having “potentially significant” lunar alignments. However, based upon the interpretation that the Knowth orientations (see: 7.8.2), are not “significant” (Prendergast and Ray, forthcoming), the range of alignments that Prendergast considers to be such appears to be exceptionally restricted. As mentioned already, Prendergast’s results have not been published, so his astronomical alignments cannot be discussed in their entirety. However, in addition to those of the Boyne Valley (see: 7.8) a number of the passage tombs in eastern and southern Ireland have reputedly “significant” solar alignments. A number of these are within the Loughcrew complex. The cairn T passage is aligned upon the equinotical sunrises and the sunlight illuminates decoration on the backstone of the chamber (Brennan 1994: 90-100; Prendergast, 2011: 51). Brennan (1994: 110-112, 116) has also argued that cairns L and U were aligned upon on the rising sun in late October/early November and late January/early February and that all three targeted the ‘cross quarter days’. The putative alignment of the ruined tomb X1 on Patrickstown Hill is upon winter solstice sunset (Prendergast, 2011: 51). In addition, the passage tomb at Thomastown, which is situated outside the complex (considered an outlier by Prendergast) is orientated towards summer solstice sunrise over the summit of Carnbane East (*ibid*.).

Among the monuments located to the south of the Boyne Valley, Brennan (1994: 121) has argued that, like monuments at Loughcrew, the passage of the “Mound of the Hostages” at Tara was orientated to the sun in late October/early November and late January/early February and targeted the ‘cross quarter days’. Hartnett (1956) noted that both Fourknocks I and II have northern orientations, which could indicate stellar connections, and it has been argued (Murphy and Moore, 2006: 150-152) that the former, may have been aligned upon the Denebstar, the brightest star in the Cygnus constellation. Further south in Co. Kilkenny, winter solstice alignments have been postulated for both passages of the ruined passage tomb at Knockroe, one being directed towards sunrise, the other sunset (O'Sullivan, 2004), but as stated by Hensey (2010: 137) a degree of uncertainty exists about whether sunlight reached the chambers. In addition to these tombs, across the Irish Sea on Anglessey, a summer solstice alignment has been confirmed for the Irish-type passage tomb at Bryn Celli Ddu (Burrow, 2010).

2.7.3.2 ‘Imprecise’ Alignments

The ‘Type B’ passage tombs were the first constructed with astronomical alignments, but where present these tend to be ‘imprecise’ (Hensey, 2010: 273, 278) and Hensey (2008: 320-325, 2010: 134-147) has discussed a number of passage tombs with ‘disputed’ alignments. Approaching these ‘imprecise’ alignments from a perspective that incorporates the “economic calendar” allows a more nuanced explanation of their significance to be advanced. Cairn G at Carrowkeel (Sligo) which features a roof-box and has an alignment centred on mid-summer, but it accepts light from the end April until the beginning of August (Hensey, 2008: 320-325, 2010: 142-147). It may be advanced that this ‘spread’ may have been connected with marking the beginning of the periods of calving and cattle breeding. Similarly, the ‘spread’ at Dowth South (Meath) where sunlight penetrates from October to February (Moroney, 1999a, 11, 1999b: 30) could have been associated with marking the end of crop harvesting and beginning of the sheep/goat and pig breading seasons and both the beginning of crop cultivation and the end of furrowing, lambing/kidding, while at the same time the alignment is centred on the winter solstice (Brennan, 1994: 64-65, 82-86; Moroney, 1999a, 1999b; Prendergast and Ray, 2002). In northern Scotland the Orcadian passage tomb at Maes Howe is aligned upon winter solstice sunset if the entrance was closed (using the ‘door-stone’) allowing control over when light entered, but otherwise sunlight would have entered the inner section of the passage three weeks either side of the solstice and the entrance from early/mid-November until early February (MacKie, 1997; Hensey, 2010: 135-137, 139).The ‘spread’ of sunlight entering the monument between November and February indicates a connection with the end of crop harvesting, end of pig sheep/goat breeding and the beginning of crop cultivation, lambing/kidding were possibly being marked.

2.8 DISCUSSION

It is extremely likely that Neolithic-Bronze Age calendars were lunisolar and that two were used simultaneously, one concerned with the ‘economic year’, the other the ‘ceremonial or religious year’. The timing of both economic activities and ceremonial or religious festivals would have been structured by the natural cycles. The timing of the ‘economic calendar’ will have had a degree of flexibility, but the equinoxes will have provided a form of regularity with lunar events occurring before or after these likely to have been used to begin each ‘half’ of the year. The ‘focus’ of the ‘ceremonial or religious calendar’ is likely to have been the winter solstice, which is astronomically predictable and observable, economically the easiest time of year to bring large numbers of people together and seasonally an ideal time to consume meat, engage in the redistribution of resources and maintain social ties. It should be emphasized that the alignment of monuments on calendrically significant phenomena is not a prerequisite for calendars to have been in use. As has been demonstrated, calendar systems are tied to a combination of natural processes and observable, predictable, cyclical astronomical phenomena, and none of these elements are determined by monument orientations. Nevertheless, the peaks evident in the orientation patterns of the TRB passage tombs of central and northern Europe clearly demonstrate calendrical concerns within a system integrating lunar months and solar years. In Western Europe the overwhelming majority of megalithic monuments have been described as being aligned between sun/moon-rise and sun/moon culmination above the horizon, suggesting that similar orientation peaks and calendrical concerns may well be present, and as noted, solstice and equinox alignments are present in the British Isles. It has also been advanced that a nuanced approach to understanding ‘imprecise’ alignments found in Britain and Ireland may indicate rational connections with the “economic calendar” with their ‘spreads’ marking economically important periods, in addition to having central orientations.

2.9 Conclusion

In conclusion, it has been advanced that two parallel lunisolar calendars are likely to have been utilized during the Neolithic-Bronze Age. The 'economic year' is likely to have been divided into two halves, with the divisions being primarily based around lunar months. The natural beginnings of spring and autumn, possibly combined with the equinoxes, are most likely to have been used as the beginning of each half of the economic calendar. The second calendar would have been primarily concerned with the 'ceremonial or religious year' and its primary focus is likely to have been the winter solstice. As a festival occasion, the period surrounding the predictable and observable winter solstice, would have represented the easiest time of year to bring large numbers of people together and engage in large-group gatherings. Evidence for potential Late Neolithic winter solstice feasting at Newgrange (Meath) will be reviewed in chapter 4. However, before undertaking that task, the importance of feasting must be investigated further and criteria for identifying feasting activity in the archaeological record must be established. These theoretical issues are the subject of the following chapter.

3 A Background to Feasting: the theory and the evidence

3.1 Introduction

As outlined in the previous chapter the winter solstice would have represented the easiest time of year to bring large numbers of people together economically, in addition to being an ideal time to consume meat, engage in the redistribution of resources and maintain social ties. In the present chapter the importance of feasting is outlined further and the issue of how it may be identified archaeologically is discussed. The first half of the chapter focuses on theoretical perspectives that have4 been employed to help understand feasting activities. The importance of such events in the creation of group identities and the different 'benefits' which may be associated with different forms of feast are considered. Particular attention is given to the juxtaposition of 'competitive' and 'solidarity' types of feast and their differing material expressions, the latter forms of feast being most connected with cyclical events, and most synonymous with large-scale gatherings. The second half of the chapter focuses on how physical remains of feasting events may be identified archaeologically. This includes considerations of the landscape setting, specific combinations of archaeological features and materials, and evidence for performance, commemoration and ceremony.

3.2 A Definition of Feasting

Feasts may be defined as special occasions consciously distinguished from everyday meals by special or unusual foods, beverages, preparations, participants, ceremony, or contexts (Hayden, 2001: 28; Wright, 2004b: 133; Twiss 2008: 419; McCorriston, et al., 2012: 57). Within this general definition, the spectrum of feasting events ranges from meals shared between two people, to communal or even regional gatherings to celebrate significant occasions (Hayden, 2001: 28; Helwing, 2003: 65). Feasts may be performed by every social group – from the family to an entire society – by kin, moiety and sodality, and individuals acting through all kinds of personae (Wright, 2004a: 125). Feasts essentially bring people together to experience one of life's biological necessities in a communal, social manner. The communal exchange and sharing of food may be considered one of the most fundamental human transactions that, through social interaction and exchange, promote social integration (Potter, 2000: 472). However, as highlighted by Dietler (2001: 77), while feasting may be practiced to celebrate community identity, it may also be simultaneously manipulated for other social purposes. Feasting essentially involves food sharing and food distribution. Food sharing appears to have its roots in the parent-child relationship and thus can be a way of expressing affection and extending familial behaviour to distant or non-kin in order to bond larger groups. As such, feasts can reinforce links between individuals or groups. By contrast, food distribution, which often requires returns at a later date, creates temporary imbalance between food donors and recipients and permits the construction of inequality (Helwing, 2003: 65; Wright, 2004b: 135).

3.3 Creating Identities

Feasting is a fundamental social practice that brings people together in a communal, social manner that marks most celebrations of life stages and natural cycles when people display, reaffirm, and change their identities as individuals and as members of groups in varying ways (Wright, 2004b: 134-135; McCorriston, 2011, 2013). The integrative aspect of feasting can have significant social and economic consequences being an important mechanism for redistributing food and instrumental in promoting both interdependence and integration (Potter, 2000: 427; Hayden, 2009; McCorriston, 2011; Moritz, et al., 2011). Periodic gatherings involving pilgrimage, sacrifice and feasting play a significant role in constituting social groups and facilitate the formation, expression and affirmation of identities (Wright, 2004b: 134; McCorriston, 2011, 2013). Sharing of food and drink has deep social and often religious significance, serving as a social lubricant while simultaneously communicating messages of membership and exclusion (Arnold, 1999: 88; Wright, 2004b: 135).

There are two forms of display that lead to the formation of identity, "assertive" and "emblemic". The former represents the active process of identity formation within which individual social-personae are constructed or reinforced and the latter results when a common set of symbolic expressions are achieved and become an expression of group identity (Wright, 2004b: 135). Communities may socially constitute themselves and establish group identities (e.g. as tribes or moieties) based not only on sustained proximity, but on the experience of pilgrimage through periodic reinforcement of their ties. Gatherings and feasts thus serve to create and strengthen ties between fragmented groups and the formation of group identities that are broader than those created through daily or frequent encounters between households or communities through functional proximity (McCorriston, 2013: 622-624).

3.4 Feast Size

Irrespective of culturally-defined (emic) or functional purpose, one useful way of classifying feasts for archaeological purposes may be by sheer scale (Hayden, 2001: 39). As outlined by Hayden (*ibid.*: 38-39) smaller feasts will be difficult to identify archaeologically unless the remains of special foods or special serving/preparation vessels are present. Even then, it may be difficult to determine whether such remains are from small special meals or whether they were part of larger, more lavish feasts. Many limited-goal feasts (e.g. work or penalty feasts) probably leave minimally distinctive material remains due to being either relatively small, and/or unlikely to involve particularly special foods or vessels. Limited-goal types of feasts may be either minimally distinctive from normal meals except for size and perhaps location, or they may be hard to distinguish from other feast types. Scale may relate to whether feasts are primarily "intra-communal" or "inter-communal" affairs, although this distinction is often hard to make ethnographically (Potter, 2000: 473).

It is safe to say that this within- versus between-group distinction also depends on the form and scale of the group identity or identities being expressed at a particular commensal event. Within-group feasts tend to be overtly concerned with group solidarity and between-group feasts are either "reciprocal" or "competitive" in nature. Reciprocal feasts (which may be broadly categorized under the solidarity banner) are primarily concerned with the creation and maintenance of alliances and cooperation. Competitive feasts are on the other hand, are overtly political in nature, hosted primarily to enhance the standing of the host(s) and are utilized to garner or consolidate political and economic support (Hayden, 1995: 27, 31).

When feasts involve more than one community (which may nevertheless form a single group) cooperative effort facilitates the financing of larger and more elaborate feasts. It is however, “ad hoc” large-scale feasts, i.e. not tied to the ritual cycle, which are frequently geared more toward the enhancement of political or social status through competitive means (Potter, 2000: 473-474). Social units range from individual families, to lineages, clans, communities, and extend to regions. While there are some distinctions to be made at each level, larger groups tend to encompass smaller ones (e.g. lineages include individual families), and thus each level of social unit tends to be associated with a specific size range of feasting (Hayden, 2001: 38-39). Among the Akha of Southeast Asia for example, the majority of commensal events are held relatively frequently and are comparatively limited in scale, to that of the household, lineage or village, with fewer than 50 people attending most forms of feast. The four larger feasts (wedding (20-200), new house (20-300), menopause (20-100), and funeral (15-1000) feasts), can involve people in their hundreds, involve clans, and be regional in scope (Clarke, 2001: 153-155). However, one might expect some differences to occur with increasing feast size. In general, the larger the feast, the more specialized and numerous consumables, food preparation facilities (hearths, roasting pits, and kitchens), preparation and serving vessels, and architectural structures required (Hayden, 2001: 39).

Competitive Feasts	
These are solely between-group feasts that are overtly competitive in nature	
Feast Type	**Additional Information**
Election	Held upon election of leaders or other political officers
Celebrate public figures	
Patron-role feasts	Held to solidify or increase influence: Competitive entertainment feasts Solicitation feasts Diacritical feasts Promotional feasts Political support feasts Entrepreneurial or empowering feasts
Exploitative or calamity feasts	Held during emergency situations which render people willing to surrender surpluses to charismatic leaders who promise relief if a large enough feast or ceremony can be held
Making war and peace	
Penalty/punishment feasts	held by those deemed guilty of a crime in lieu of punishment
Solidarity Feasts	
These are primarily within-group feasts but also include "reciprocal" between-group feasts	
Sub-Category: Life Cycle Feasts	
Feast Type	**Additional Information**
Birth	
Rites-of-passage or Initiation	To mark the various child-growth stages: new-born naming; maturation (such as Tattooing); life-crisis (such as mourning events); puberty and naming feasts
Betrothal and Marriage	
Pregnancy and/or Childbirth	
Menopause and/or becoming an Elder	
Death and funeral feasts	
Sub-Category: Cyclical Feasts: Agricultural and Religious	
Feast Type	**Additional Information**
Promoting land fertility	Including Planting and Harvest festivals
Religious ceremonies	Held at noteworthy celestial or seasonal events e.g. the New Year’s festival
Memorials for deceased	Including ancestor worship and ancestor offerings
Sub-Category: Curing Feasts	
Feast Type	**Additional Information**
Purification	Including feasts associated with curing sickness, promoting fertility, and house consecration

Table 3.1: Types and categories of feast (adapted from Hayden, 1995, 2001, 2009, 2011; Potter, 2000; Clarke, 2001, Dietler, 2001, 2007; Dietler and Hayden, 2001; Perodie, 2001; Helwing, 2003; Wright, 2004b; Twiss, 2008)

3.5 Benefits of Feasting

Feasting is powerful and often transformative; through feasting, social identities are both enacted and altered, political competitions undertaken, and ideologies ingrained. Feasting can play a key role in constructing and validating social norms by valorising innovative materials, concepts, and practices (Dietler, 2007; Twiss, 2008: 418-419). Often one motive or another is highlighted as the reason for feasting, but multiple functions are commonly served (Clarke, 2001) as feasts are inherently and simultaneously arenas for social competition and social integration (Dietler, 2001; Adams, 2004: 61-62; Twiss, 2008: 419; Hayden, 2011: 46; Sánchez Romero, 2011: 24). Some are designed to promote cooperation and downplay social differences, while others promote the feast-givers socially, politically, or economically (Hayden, 2001; Perodie, 2001).

Explicitly competitive feasts bind participants together through shared consumption, mutual participation in culturally meaningful events, and the creation and maintenance of alliances (Clarke, 2001). Competitive displays in particular are often highly reliant on within-group cooperation (usually within lineages or clans or affiliated groups) and can be viewed as displays of the strength of the group's solidarity or cooperation (Hayden, 2011: 46). Feasts conceived sincerely by the participants as harmonious celebrations of community identity can also be platforms for manipulation and the acquisition of various forms of social and/or political influence (Dietler, 2001: 77). Solidarity feasts sometimes contain elements that reaffirm the power structure within the group, and to an extent can be viewed as competitive displays (Hayden, 2011: 46-47). Common types of solidarity feast are those associated with the life cycle and occasionally (depending on the domestic unit in question) these may contain promotional aspects, and may even be regarded as promotional feasts (Sánchez Romero, 2011: 24). Feasts can articulate and reinforce existing social categories, such as status, power, gender, and age, but can also play an important role in processes of social change and have a profound impact on the course of historical transformations (Dietler and Hayden, 2001). In addition to shaping the political fortunes of individuals in small-scale societies, feasts also provide the quintessential context for the negotiation of a variety of roles and social relationships and dissolving social tensions (Spielmann, 2002: 196; Helwing, 2003: 66). It must also be remembered that feasts are not only held for practical and social benefit, but also for theological and liturgical reasons, e.g. to maintain the cosmic order. Nevertheless, the results of feasting are often inherently practical (Hayden, 2001: 28-35; Wright, 2004a: 126) and Hayden (2001: 29-30) has outlined nine common practical benefits, listed in Table 3.2.

	Benefits of Feasting
1.	Mobilize labour
2.	Create cooperative relationships within groups or conversely, exclude different groups
3.	Create cooperative alliances between social groups (including political support between households)
4.	Invest surpluses and generate profits
5.	Attract desirable mates, labour, allies, or wealth exchanges by advertising the success of the group
6.	Create political power (resource/labour control) through the creation of a network of reciprocal debts
7.	Extract surplus produce from the general populace for elite use
8.	Solicit favours
9.	Compensate for transgressions

Table 3.2: Benefits of Feasting (adapted from Hayden, 2001: 29-30)

The majority of feasting benefits centre upon the creation or maintenance of social relationships. These may be important for various reasons (defence, marriage, wealth accumulation, etc.), but establishing desirable social relationships constitutes the bottom line for many feasts (Hayden, 2001: 30). Although not exclusively, calendrically scheduled communal gatherings and feasts often serve as means to reduce subsistence risks by creating “mutual-support networks” which mediate the redistribution of the surpluses created to accommodate them (Adams, 2004: 57; Hayden, 2009: 599-600; McCorriston, 2011; Moritz, et al., 2011). These reciprocal networks allow participating groups to cope with periods of subsistence hardship and socioeconomic calamities (Hayden, 2009: 599).

3.6 Competitive feasts

Patron-role and related feast types are overtly political in nature and emphasize formal hospitality between unequals, wherein feasts are provided by an identifiable host at his own expense for his companions or guests (Dietler, 1990, 1996, 2001; van der Veen, 2003: 414; Sherratt, 2004: 304). Balanced reciprocity is not expected, rather these feasts reiterate and legitimize existing unequal relations of status, power and subordination as political, social and/or economic debt occurs at each feast. The unequal social relations are reinforced through the repetition of unequal hospitality events (van der Veen, 2003: 414; Hastorf, 2011: 215). Such competitive entertainment feasts create material profit for the sponsor as investments are returned with interest at future events through the culumative effect of multiple people re-paying their debts. Such feasts are large, lavish events where the sponsor endeavours to maximize his contractual obligations and profit by distributing enormous amounts of food and property (Perodie, 2001: 190). Where competition for relative social position conditions success, luxury foods are in some cases functional requirements for condensing and conveying information. The expense of producing such goods often limits their distribution to special occasions that can be arranged only by those who can afford them. By conspicuously paying such costs, sponsors advertise differences in ability to access resources and control labour. Patron-role feasting is a tangible way of standardizing display and broadcasting social power, allowing both fine-grained judgment of an individual’s influence within a group and an honest signal of a corporate group’s political will and strength (Bird and O’Connell, 2006: 167). Some such feasts can be utilized as a mechanism for acquiring or maintaining political positions, and obtaining or increasing political support (Perodie, 2001: 190). Similarly, entrepreneurial or empowering feasts are employed to acquire social power and/or economic advantages, including labour (van der Veen, 2003: 414).

At least two forms of unidirectional exchange should also be included here, solicitation and diacritical feasts. Solicitation feasts are hosted by those wishing to solicit favours or support from more powerful individuals (Perodie, 2001: 190) and diacritical feasts serve to naturalize or reify differences in social status (van der Veen, 2003: 414). Penalty or punishment feasts are held by those deemed guilty of a crime in lieu of punishment. Exploitative or calamity feasts may be held during emergency situations (due to climate, disease, or other catastrophes) which render people willing to surrender surpluses to charismatic leaders who promise relief if a large enough feast or ceremony can be held (Hayden, 2001: 37).

Promotional feasts can be differentiated from solidarity feasts in the reciprocal debt relationships with key figures that are created at these events (Adams, 2004: 61). Promotional feasts involve a large number of attendees and advertise group success and prosperity in order to attract desirable potential labour, allies, exchange partners, and other supporters. Group success and prosperity is promoted by making public distributions to important and specifically invited individuals with whom a relationship is desired (e.g. families with potential marriage partners, or potential security allies). Distributions are also made to other miscellaneous guests and supporters in order to promote the host group to as wide a circle as possible. These events are generally held in secular locations (e.g. within the host household or representative household of the primary sponsoring group) and the large amounts and value of food provided by one household or group in comparison to others are the main elements that differentiate these from solidarity feasts (Perodie, 2001: 190; Adams, 2004: 61). Also relevant here are feasts associated with making war and peace, which are again associated with advertising group success (Hayden, 2001: 37; Kirch, 2001: 173-174).

Some leaders promote the benefits of feasting to their community or support group in order to gain as much control as possible over the use of surpluses for personal advantage. These individuals attempt to set agendas, manipulate war, peace, and alliances, and create cults and secret societies to further their own goals. In fact, such individuals can have a lasting impact upon the trajectory of cultural change (Hayden, 2001: 31; van der Veen, 2003: 414). However, leaders responsible for organizing feasts and maintaining advantageous alliances often promote their own interests over those of their lineage, community or other support group (Hayden, 2001: 30-31; van der Veen, 2003: 414). Notwithstanding, in most small-scale societies restrictions are placed on the capacity of individuals to gain political or social power and aspirants can only achieve leadership and other communal roles with group endorsement (Spielmann, 2002: 196). In such non-stratified societies lacking centralized power, individual people and households (even if considered “wealthy”) cannot become socially dominant. Rather, competition and relative inequalities occur primarily between the lineages and clans as a whole and it is at this level where social dominance can occur (Clarke, 2001: 148). Importantly, Spielmann (2002: 196) has highlighted the fact that because political action is restricted to the public arena of communal commensality in these societies, the political fortunes of individuals and corporate groups do not affect the endurance and significance of gatherings as an integral context for competition, display, distribution, interaction, and consumption over the *longue durée*.

The terms “prestige” and “status” are often referred to in the context of feasting (e.g. Dietler, 1990, 1996, 2001) as this constitutes one of the most conspicuous platforms for symbolically expressing success (Hayden, 2001: 32). Hayden (*ibid*.) suggested that the “Western” terms status and prestige carry connotations of psychological gratification stemming from the approval of others, but equivalent terms in transegalitarian societies generally carry a different set of connotations relating more to economic success, political success and power, reliability in honouring debts, and the ability to organize people for a variety of purposes. In fact, he argued that a more appropriate translation of status and prestige in contemporary terms might be “credit rating”. However, the current author does not feel this term fitting and suggests “*esteem*”, which means to regard highly or favourably and with respect or admiration, may be more representative. Unfortunately, the terms “prestige” and “status” continue to be used in the literature and often with reference to political or economic power. There are various ethnographic examples which demonstrate that “prestige” gained in the feasting sphere need not necessarily translate directly to political or economic power, rather it does equate to what we would call “esteem”. For example, within the Kalasha culture the awarding of prestige, special titles, and symbols to those that give prescribed feasts, is part of a system that distributes prescribed amounts of meat, cheese, and bread. This tends to level the economic differences caused by superior ability, fortune, or hereditary transmission and importantly, the prestige acquired through feasting has no direct connection with political power (Cacopardo and Cacopardo, 1989: 318). Additionally, in modern Puebloan society some large-scale commenasal events, such as wedding feasts, may be considered more an obligation to community members and more related to proving communal worthiness than an opportunity for “prestige” enhancement and placing "followers" in debt. Financing large feasts often places the host and their kin in considerable debt for many years, which can have the effect of lowering “status” (including political standing) despite raising levels of “esteem” within the community (Potter, 2000: 474).

3.7 Solidarity feasts

Solidarity and other essentially cyclical feasting types primarily create, maintain and enhance cooperative relationships (between individuals or groups) which strengthens in-group cohesion and/or alliances between groups (Hayden, 2001: 37; Helwing, 2003: 65; Adams, 2004: 57; Bird and O'Connell, 2006: 167; Sánchez Romero, 2011: 24). As noted previously, a frequent benefit of calendrically scheduled feasts is the creation and maintenance of "mutual-support networks" which promote solidarity through the redistribution of the surpluses (Adams, 2004: 57; Hayden, 2009: 599-600; McCorriston, 2011; Moritz, et al., 2011). A complementary mechanism by which cyclical feasts create solidarity is through the creation and reinforcement of shared identities (Sánchez Romero, 2011: 24). Solidarity within a group enhances economic productivity and security, promotes mutual support during conflicts and ensures support for leaders. For instance, all feasts associated with the agricultural cycle are considered essential for promoting successful harvests on the one hand, but also provide a means to reinforce solidarity within and between communities (Adams, 2004: 63). In solidarity feasts, hierarchical differences are downplayed, food is the main product distributed, contributions from all participants frequently occur, no debts or return obligations result, and participation and attendance is widespread. Some of the most common types of solidarity feast are those associated with the life cycle, frequently births, initiations, weddings and funerals (Perodie, 2001: 190; Sánchez Romero, 2011: 24).

A sub-set of solidarity feasts are "celebratory feasts", which usually serve to reinforce existing social bonds, either between individuals of approximately equal social standing or between individuals of different social standing in instances where the feast does not include a competitive aspect. These include small family celebrations, larger community feasts in societies with little emphasis on inequality and many religious/ceremonial (cyclical) feasts, where issues of rank and distance may be temporarily suspended (van der Veen, 2003: 414). Such gatherings may be held at sanctuaries or temples and be regional in scope and also serve as platforms for aggregating dispersed populations or for reaffirming social distance in concentrated populations (Borgna, 2004: 55).

Like the various forms of solidarity feast, reciprocal feasts initiate and maintain alliances between groups for the purposes of security, marriage, and economic benefits. These feasts require the involvement of two or more groups (or their representatives), and each generally tries to impress the other(s) without being overtly competitive so as to maintain an amiable atmosphere (Perodie, 2001: 190). As noted in various ethnographic contexts (Potter, 2000: 474; Adams, 2004: 62), communal feasting may be part of or associated with the various rites are performed to cure illnesses (in humans and animals), alleviate economic hardships, and improve fertility (of the land, animals and humans). These healing ceremonies are not usually structured by annual cycles, but do occur on a fairly regular basis (Potter, 2000: 474) and a cyclical aspect certainly exists as medical attention or different sorts of healing are required more commonly during different stages of the year. Such curing or purification feasts provide hosts with a number of benefits, especially solidarity (Adams, 2004: 62).

3.7.1 Material Expressions of Competitive and Solidarity Feasts

According to Hayden (2001: 37-38, 2011: 47) despite the blending of some competitive, solidarity and promotional functions within single feasting events (see below), as many feasts have predominant competitive display/promotional or solidarity characteristics they should exhibit very different material expressions. He proposes that solidarity feasts, no matter what their size, should entail minimal departures from standard daily foods or material items and will rarely if ever show evidence for 'wealth destruction', or even display of prestige objects. On the other hand competitive or promotional feasts should represent major departures from daily standards with consequent pressures to develop and change both food and material technologies. He suggests that consumption of high-cost animals, lavish displays or destruction of prestige items, waste of food, and large food preparation facilities built by hosts at the feasting site are the hallmarks of competitive displays and have no reason to exist without such motivations.

Solidarity type feasts are often 'pot-luck' type affairs where all of the participants contribute in a (theoretically) non-competitive atmosphere and may be characterized by "decentralized planning". The pooled resources thus originate from different domestic units and frequently little attention is paid to the consumption of exotic "luxury" products (Sánchez Romero, 2011: 24; Hastorf, 2011: 215). This form of feast, at varying scales, is seen throughout Classical literature (see Sherratt, 2004: 304). Potter (2000: 474) has advanced that as within-group feasts are usually financed by multiple households (often anonymously) and tend to be relatively non-competitive in nature, the lack of direct competition for esteem tends to limit the quantity of resources mobilized. However, as noted previously (2.6.1), a heightened relationship between animal husbandry (and agricultural) practices and commensal activities emerges in societies within which consumption events, i.e. gatherings and ceremonies, are calendrically scheduled (Marshall, and Hildebrand, 2002: 103-104; Spielmann, 2002: 197) and domestic animals are reared specifically for these communal consumption events such limitations need not necessarily exist (Keswani, 1994: 257-258; Marshall, and Hildebrand, 2002; Spielmann, 2002: 197). As such, although societies with seasonally structured subsistence abundances may be largely restricted to a cyclical ritual feasting pattern (Potter, 2000: 474) the complementary structuring of agricultural/pastoral activities means the required surpluses should be available as and when required.

Although there may not necessarily be major food preparation facilities at large solidarity feasting events due to the 'pot-luck' style of food preparation (Hayden, 2011: 47), it must be borne in mind that many domesticates will have been brought to feasting locales on the hoof. The redistribution of domestic animals at communal feasting events may take a number of forms, including the exchange of livestock. Butchered meat could be both cooked and consumed at the time of the feast and (potentially preserved e.g. cured or smoked) portions taken away for further redistribution and later consumption (Keswani, 1994: 257-258; Dabney, et al., 2004: 213). As such, it may be possible to refine elements of Hayden's propositions and advance that solidarity feasts are unlikely to include consumption of "luxury" foods where there is an emphasis on quality, style and 'foreignness' (Ervynck, et al., 2003: 431; van der Veen, 2003: 411-412) and that large food preparation facilities *may* be absent from feasting sites.

The disassociation of the destruction of "wealth" and solidarity feasts also poses a technical problem as pottery sherds are a feature of many potential feasting sites. Although a complicated question and vessels might be deliberately destroyed during the course of or following a feast. We need not assume or indeed insist on ceremonial breakage to suspect that a large feast will leave behind clear ceramic evidence (DeBoer, 2001: 229; Dabney, et al., 2004: 202). In fact, the mere presence of large numbers of people combined with the consumption of alcohol (and potentially other intoxicants) and the high levels of excitement associated with festivals virtually guarantees broken vessels (Helwing, 2003: 66; Dabney, et al., 2004: 202; Dietrich, et al., 2012: 692). Moreover, if the participants travelled some distance to take part in a particular feast and were provided pottery, many would probably discard the vessels before returning home (Dabney, et al., 2004: 202). As such, we cannot assume that (a) broken ceramics automatically equates to the destruction of "wealth" or (b) that the presence of pottery on a feasting site eradicates the possibility of the events held there displaying predominantly solidarity characteristics.

3.7.2 Intoxicants

Twiss (2008: 423) has noted that feasts commonly involve and may even require the consumption of alcohol, frequently in large amounts. For instance, maize beer, or chicha, is a key component of central Andean feasting and similar emphases on alcohol consumption at feasts are apparent within various Oceanian, Amazonian, Mesoamerican, Asian and African cultures. As intoxication induces altered states of consciousness, alcohol has frequently played a prominent role in rituals of both a religious and secular nature (Dietler, 2006: 241). Cross-culturally the consumption of alcohol is utilized to promote social solidarity through its role in facilitating social interaction in the context of informal social gatherings. For example, among the Iteso of East Africa neighbours are defined as “people with whom one shares beer” and communal beer pots are the centre of men’s everyday social life, around which stories are told, gossip passed, and disputes and policy discussed (Karp 1980; Dietler, 1990: 362). Cross-culturally drinking often plays an important ceremonial role and alcohol itself is often imbued with ritual or symbolic significance. Religious rituals, festivals, and the major rites of passage commonly involve drinking parties, libations, toasts, or exchanges of drink. However, the extent of the integration of drinking into the ceremonial framework of a society varies (Dietler, 1990: 362).

The association between alcohol and religion has great time-depth and the existence of beer is attested to in the earliest written records from Mesopotamia and Egypt (Jennings, et al., 2005: 279; Dietler, 2006: 241). In fact, this association may have its origins in the Pre-Pottery Neolithic (PPN) of the Near East, as it is possible that the knowledge of creating alcoholic intoxicants was already known at this time. It has been advanced (Dietrich, et al., 2012: 688-689) that wheat-beer production may have been carried out at Göbekli Tepe in modern Turkey. The association is also recorded in more recent times, for example in ancient Greece, according to textual and iconographic resources the social ritual of the symposium was directly associated with the divine power of Dionysus and ritual libations were an essential part of associated religious practices (Dietler, 2006: 241). In ancient Mesopotamia the needs of the gods were believed to parallel those of human beings and ritual activity centred around the necessity of providing the gods with a regular supply of food and drink, including beer and wine. At religious feasts gods, rulers, priests, and people ate and drank together (Whittaker, 2008: 90). There is also an even wider body of cross-cultural evidence for direct associations between drinking and religious experience (Heath, 1987: 32; Dietler, 1990; Joffe, 1998: 298; Butler, 2006; Whittaker, 2008). For example, similar ideas to those recorded in Mesopotamia are apparent within the Brazilian cult of the Batuquw where participants are “possessed” by various deities, which consume alcohol by “entering” human bodies, during religious celebrations (Whittaker, 2008: 89).

If alcohol was consumed and/or narcotic substances were used in a ‘spiritualistic’ sphere during communal gatherings of varying size, this may suggest attempts to contact or influence the ‘otherworld’, ‘ancestors’, ‘spirits’, ‘supernatural’ or ‘deities’ on such occasions through the medium of an altered state of consciousness (Sherratt, 1995; Guerra Doce, 2006a). Furthermore, partaking in such activities, whether within a sub-group or en masse would also increase initiates feelings of social integration and membership of the collective (Douglas, 1987; Wilson, 2005). It has been shown ethnographically (Jones, 2007: 167-168) that feasts or gatherings that are outside any conspicuous structures of authoritarian control frequently involve the consumption of large quantities of alcohol. Therefore, if such substances were used exclusively within the social realm during communal gatherings, as such activities contribute to inter-personal relationships, they would also strengthen group solidarity and cohesiveness.

3.7.3 Luxury Foods

The categories of food that often feature cross-culturally as luxuries are those that offer a refinement in texture, taste, fat content or other quality (such as stimulant or inebriant) and that offer distinction because of either their quantity (especially of meat and alcohol) or quality (expense, exotic origin, complexity, style, etiquette, etc.) (van der Veen, 2003: 405, 413, 420). As highlighted by van der Veen (*ibid*: 405, 412), ethnograhic research has shown that in societies without strong social stratification, luxury food is defined by quantity, and elaboration of common staples is used to mark special occasions. Conversely, an emphasis on quality, style and ‘foreignness’ is characteristic of luxury foods in societies with institutionalized forms of social ranking. In the former context the consumption of luxury foods is used primarily to create or enhance social bonds, in the latter exclusivity and distance are emphasized. As such, in hierarchical societies luxury foods are often those that are different and/or in short supply, and include different constituents, especially foreign ingredients. As these foodstuff are typically rare, they are considered luxuries simply because they are generally very expensive (Ervynck, et al., 2003: 431; van der Veen, 2003: 411-412). In non-hierarchical societies quantity, particularly that of meat, typifies the food used at special occasions as it is a potent symbol of success, especially in situations where food was/is scarce and its availability irregular (van der Veen, 2003: 412; Twiss, 2008: 423). Another possible characteristic of a luxury diet within such societies are the preferential selection of prime quality animal-cuts (Ervynck, et al., 2003: 432; van der Veen, 2003: 411). In this context Ervynck, et al. (2003: 432) emphasise the importance of 'selection', as the significant overrepresentation of high-quality cuts at a feasting event must be an expression of luxury. Luxury foods may also be defined as animals that are killed before their optimal slaughter age and/or outside the optimal slaughtering season. Given the loss for the producer, non-optimal slaughtering makes products more “expensive” (*ibid*.: 433). We should also consider possible restrictions on the consumption of hunted foods. For instance, Wright (2004b: 160) has emphasiszed probability that in Mycenaen contexts game animals such as deer and boar were restricted in distribution, prepared differently than domesticated animals, and consumed only by those who had participated in the hunt, which could perhaps be considered a luxury.

3.8 The Festival Experience

Feasts are events of collective experience held on both profane and spiritually triggered occasions. In the former case, feasts predominantly function as a framework for the negotiation of social relations. In the latter, they may form an integral part of ceremonies. Both feasts and ceremonies offer a framework for collective emotional experiences that allow the constitution of meaning through their communicative and performative structure (Helwing, 2003: 66). In this context, it is important to appreciate that even at gatherings and festivals with overtly religious associations, the experiences that are most fundamental to the vast majority of attendees may be those of relaxation, jollification and entertainment, rather than heightened religious consciousness or feats of energetic piety. It will have mattered to almost everyone that the ceremonies were properly performed, but how they were to be interpreted may have mattered much less than the range of stimulating activities they gave occasion to (Scullion, 2007: 201, 203). As noted by Dietler and Herbich (2001: 246) even in the case of "lavish work feasts" for participants they are viewed primarily as festive social occasions.

Numerous Pre-Pottery Neolithic (PPN) dancing scenes help to shed some light on the longevity of this association with feasting and help emphasize the ecstatic aspects of feasting as far back as the Near-Eastern early Neolithic (Dietrich, et al., 2012: 692). The scenes depicted on Greek Attic vases are also particularly evocative of this aspect of communal gatherings as they constantly connect sacrifice and feasting with ideas of festivity and celebration (Bremmer, 2007: 142) and the breaking of vessels at a feasting site may be a reflection of such ecstatic behaviours (Dietrich, et al., 2012: 692). For most of those attending a gathering or festival its primary attraction may not have been what made it unique, but the features it had in common with others, such as markets (or their equivalents) and entertainments which could include performances and shows of one kind and another and dramatic, choral, and athletic competitions (Scullion, 2007: 202-203). On such occasions ceremonies and feasts may have involved and/or been accompanied by such spectacles as bonfires and various forms of music, chanting, procession, singing, dancing and opportunities for sexual contact (Robertson, 1984; Cacopardo and Cacopardo, 1989; Scullion, 2007). Within the prescribed framework of an individual feast, and enhanced by the influence of unusual states of mind, a level of higher excitement and greater sensitivity can be reached that provides space and reason for unusual behaviour that would be impossible (or at least inhibited) under normal circumstances (Helwing, 2003: 66). A particularly evocative example from among the PPN dancing scenes highlighted by Dietrich et al. (2012: 692) is the sherd of a limestone bowl from Nevah Çoti which depicts two persons with raised arms joined in their dance by a turtle-like being, possibly reflecting their heightened and potentially altered states of consciousness.

3.9 Recognizing Feasting in the Archaeological Record

Ethnographic data indicate that despite the cross-cultural variability of feasts, certain behaviours and attributes are frequently associated with feasting. Most of these affect the material record to some extent, although some do so considerably more than others. These material signatures allow identification of past feasting practices in the absence of textual records or clearly interpretable artistic depictions (Twiss, 2008: 419). Essentially three aspects of feasting are more likely to be transmitted in the archaeological record: (1) the spatial distinction of the feasting stage or location; (2) communal consumption of lavish amounts of special food, beverages, and possibly narcotics, which can be detected in the archaeological record through the remains of food preparation, consumption, and deposition features; and (3) the presence of performative paraphernalia involved in display, commemoration, exchange and the negotiation of social relationships (Helwing, 2003: 66; Twiss, 2008: 424). However, all three aspects will not necessarily be represented and no single data set is likely to be diagnostic of feasting, especially since many feasts lack several of the material correlates (Helwing, 2003: 66; Twiss, 2008: 424). For example, small feasts are commonly prepared over normal household hearths and the food remains are often rapidly dispersed, and intermediate size feasts (c. 10-50 people) rarely leave the kinds of evidence that facilitates their identification, unless held at special locations such as megalithic tombs (Hayden, 2001: 47; Twiss, 2008: 424). Nevertheless, most feasts should be marked by one or more of the diagnostic signatures.

3.9.1 Special Locations

Although many feasts are held inside homes, feasting often occurs at special structures or locations (Twiss, 2008: 423; Hayden, 2011: 39). Special feasting locations are potentially distinguishable from domestic buildings and identifiable in the archaeological record as large structures or sites that are unusually constructed, elaborated or decorated, that have unusual artifactual and/or ecofactual contents and that may display spatial separation (Twiss, 2008: 424; Helwing, 2003: 66). Entire special sites may be constructed for large (sacred) feasts or pre-existing sites may be utilized, modified or augmented (Twiss, 2008: 424). Whilst being distinct from normal, domestic locations these can be loci associated with nuclear households, residential corporate households or open communal spaces, such as a village plaza. Alternatively these may be areas with restricted access, such as a sacred precinct or platform, or a special building such as a shrine or a temple (Hayden, 2001: 40; Helwing, 2003: 66; Twiss, 2008: 424). Feasting can also take place at mortuary or remote locations that show evidence for atypical concentrations of religious (or otherwise specialized) paraphernalia or symbolic activity and are clearly not habitation sites. These may be associated spatially with sacred buildings, graves and/or human remains or other religious paraphernalia, particularly items large enough to be suitable for public viewing (Hayden, 2001: 40; Twiss, 2008: 423-424).

3.9.2 Food-Storage Facilities

Food surpluses constitute the essential economic basis for feasting (Hayden, 2001: 40, 2011: 41). Many feasts require so much food and/or drink that surpluses must be accumulated and stored well in advance, for months or even years. As such, food-storage facilities such as storage pits, granaries and animal pens constitute common material expressions of feasting (Hayden, 2001: 40; Twiss, 2008: 419). However, the absence of storage facilities does not preclude the hosting of even very large feasts. Living resources in particular may be stored offsite. Domesticates may be kept alive in fields or in herds, and wild resources may be ‘‘stored” via the tabooing of fishing, hunting, and gathering areas, allowing reserves to build up prior to an event (Twiss, 2008: 422).

3.9.3 Food-Preparation Facilities

Large quantities of food and drink must be prepared, so large-scale and/or numerous cooking equipment and facilities are cross-culturally correlated with feasting (Twiss, 2008: 422). The relative size and number of hearths is a good indicator of feasting activity. As such, the occurrence of several hearths in a row, large earth ovens, or unusually large outdoor hearths or roasting pits may be indicative of unusually large feasts (Clarke, 2001: 161; Hayden, 2001: 40, 49, 2011: 36; Twiss, 2008: 422). The construction of large temporary kitchens, particularly in unusual locations, that would facilitate the preparation of unusually large amounts of food may be archaeologically recognizable. Such facilities would only be needed for very large feasts as small and intermediate-sized feasts would generally be prepared over normal household(-sized) hearths (Clarke, 2001: 161; Hayden, 2001: 40, 49; Helwing, 2003: 66).

3.9.4 Special Deposition Features

One of the most common ethnographic attributes of feasting is the consumption of copious quantities of food and/or drink. This mass consumption has several common material correlates which may be defined as feasting middens, bone caches and refuse fires containing feasting material (Hayden, 2001: 40; Twiss, 2008: 419; deFrance, 2009: 139). Moreover, it has been proposed that the deposition of feasting remnants was a device by which the occasion was commemorated. Bones deposited in ditches are thought to have acted as visible remembrances of former feasts which might be recalled during later gatherings (Serjeantson, 2011: 53). Additionally, faunal remains in human graves have sometimes been cited as evidence of feasting (Clarke, 2001: 162). Dabney, et al.(2004: 204) have brought attention to the fact that when trying to distinguish feasting activity it needs to be taken into account that two waste sources might enter a disposal feature, one being feasting, the other daily activities. As such, the distinctiveness of the waste resulting from feasts may become "diluted", depending on the nature of the site. If feasts are small and infrequent, their remains will probably be archaeologically indistinguishable from those of daily meals. However, waste from daily activities will in general be more fragmentary, exhibit greater differences in wear, and may contain a broader range of vessel types, not only those associated with eating and drinking.

It must also be remembered that not all feasts produce middens or other depositional features as, for example, feasts may involve the consumption of vegetable foods only or participants may take home most of the meat prepared (Twiss, 2008: 419). Feasting middens represent the primary deposition of atypically large quantities of fanunal remains (Twiss, 2008: 419; Hayden, 2011: 37), which may be additionally associated with pottery. Depending on cultural patterns of refuse disposal and post-depositional processes, such middens may accumulate in areas within or adjacent to ceremonial precincts (Keswani, 1994: 261). Caches, or intentional burials of animal remains, not associated with human burials may represent the best examples of ''ceremonial trash''. These refuse pits typically contain unusual animal bone assemblages (and/or pottery) and may be associated with a variety of structure types or landscape features (Helwing, 2003: 66; deFrance, 2009: 139). Caches sometimes feature elaborate modes of discard and although their function is often difficult to determine, they appear to be distinct from dedicatory offerings (Borgna, 2004: 263; deFrance, 2009: 139).

Evidence for food wastage in the form of articulated joints and unprocessed bones is often recognizable archaeologically as unprocessed or minimally processed food remains. In fact, it could suggest that meat had been provided so abundantly for a feast that carcasses could be less heavily processed than usual (Hayden, 2001: 40; Twiss, 2008: 424; Serjeantson, 2011: 65). Other evidence for conspicuous or excessive consumption may include evidence that all or a proportion of the bones were not cracked to extract marrow, and that when 'marrow cracking' is observed bones were not smashed further to extract all the available fats (Serjeantson, 2006). Special discard practices such as refuse fires containing substantial quantities of faunal remains are also very indicative of feasting (Clarke, 2001: 161; Twiss, 2008: 419).

Feast-associated disposal features are distinguishable from ordinary midden material by context and/or content as they may contain the remains of a limited range of species, a single species or class of animal. They also may contain very specific bone elements as, for example, the distribution of "prime cuts" at a feast can result in a spatially patterned distribution of body parts as individuals may consume their portions in specific locations. Bone assemblages which lack, or have more, of certain body parts might be indicative of feasting activity. For example, the occurrence of "missing" animal parts at a site raises the possibility of a regional feast, involving participants from a number of different settlements as portions of meat will typically be taken away and redistributed. When a marked presence or absence of animal body parts expected to survive does not exist, it may indicate that feasting involved whole animals (Keswani, 1994: 261; Dabney, et al., 2004: 213; deFrance, 2009: 139; Serjeantson, 2011: 65).

Other distinguishing features of deposition associated with large feasts include a general lack of soil matrix between bones and/or sherds within a feature and potentially less general weathering of artefact surfaces. Thus evidence may be characterized by areas or features consisting of densely packed sherds and/or bones (Dabney, et al., 2004: 204; Serjeantson, 2011: 63). Another feature may be the relative number of bones to potsherds within a midden and it may be advanced that meat was eaten in quantity at the site when bone is more abundant than pottery (Serjeantson, 2011: 63). Additionally, the frequency of gnawing on bones may indicate if material was buried quickly after exposure (Munson and Garniewicz, 2003: 408- 409; Dabney, et al., 2004: 201).

3.9.5 Animals Consumed

Many distinctive feasting foods, be they plants or animals, are rarely-eaten and frequently symbolically important. They are often costly to produce being labour-intensive, ecologically problematic, imported, or otherwise difficult to acquire (Hayden, 2001: 40; Twiss, 2008: 422-423). Meat is frequently the dominant food at feasts, and large animals in particular are commonly consumed as their suitability as feasting food is multifaceted. Large animals supply copious amounts of meat, which is an inherently prized food in most traditional hunter-gatherer and small-scale agricultural societies. The ceremonial distribution of this valued good is an effective strategy for converting material storage (which is only good for a set period of time) to social storage (which lasts longer). The slaughter of large animals also represents significant expense and their consumption intrinsically signals the importance of an occasion. Theoretically, the larger the maximum-sized animal(s) consumed at an event the larger the feast, a relationship which appears to be generally supported by empirical observation (Hayden, 2001: 49; Twiss, 2008: 423). The optimum time for butchery is when an animal achieves adulthood, this being 2-3 years for sheep and pig, the latter attain much of their body weight only after the second summer, and at 3-4 years for beef-cattle (Gregg, 1988: 122; Green, 2002: 36-37).

By far the most common, if not exclusive use of domestic animals in transegalitarian societies is for feasting. It is also possible that in small-scale societies the remains of all domestic animals intrinsically signal feasting, as there is often a specific choice of rearing domestic animals for communal consumption events. In some cases this may be identifiable through evidence for the seasonal slaughter of animals (Keswani 1994; Hayden, 2001: 49; Twiss, 2008: 422-423). Feasting sites will frequently have distinctive patterns in their faunal assemblages when compared to contemporary settlements and are essentially unrepresentative of the contemporary livestock economy (McCormick, 2007a; Mukherjee, et al., 2008; Madgwick, et al., 2012). These distinctive patterns may be characterized by extremely large numbers of cattle and/or a predominance of pig (Rowley-Conwy and Owen, 2011). Additionally, as large game animals may be quite dangerous, their consumption at a feast would endow the occasion with great symbolic power. It would also endow the provisioning hunters with considerable status, as inclusions of game-species at feasts constitute very public displays of hunting success (Twiss, 2008: 423). The proportional representation of different species in a feasting assemblage may have additional significance as ideological and social requirements can influence animal husbandry patterns. This influence can reach as far as particular species being required for specific types of sacrifices or exchanges ultimately resulting in slaughter and thus such patterns may be reflective of the relative frequency of associated ceremonies. Moreover, an archaeological faunal assemblage characterized by a predominance of young or sub-adult animals could represent intensification or heightened frequency of ceremonial consumption. This could be indicative of resource surpluses being conducive to the performance of frequent events involving animal slaughter. Alternatively, it could indicate either social or ecological stress, requiring a greater frequency or ritual performances to mediate tensions, appease the gods or the ancestors, and satisfy human hunger at the expense of maintaining herd size and strength. These possibilities can only be evaluated with reference to case-specific ecological data and related archaeological evidence (Keswani, 1994: 261).

3.9.6 Pottery Vessels

It is important to consider whether it is reasonable to expect to find large deposits of ceramics from feasts, since vessels would retain their utility and might continue in use. The deposition of intact vessels and even deliberate destruction of complete vessels are known practices associated with funerary meals, but are not well established in other contexts. Although vessels might be deliberately destroyed during the course of a feast or afterward, the ceremonial breakage of vessels needn’t explain clear ceramic evidence left behind by a large feast. As noted above (3.7.1), the presence of large numbers, the consumption of alcohol and vessel discard virtually guarantee the occurrence of broken vessels. Furthermore, ceramics are often utilized to make offerings to deities and in ceremonial performances, such as toasting or leaving food remains for the dead, and these vessels are not a priori evidence for feasting, unless the remains are so substantial that they indicate unusual consumption of food or drink (Wright, 2004b: 134). Although potentially dependant on depositional and or recovery circumstances, it has been suggested that ceramics from a feasting deposit would be recognizable archaeologically by the physical association of vessels with one another, very high "mendability" into whole pots, a prevalence of shapes associated with feasting, a lack of shapes associated with other activities, complete chronological homogeneity of shape and decoration, and minimal wear from weathering processes (Dabney et al., 2004: 203; Twiss, 2008: 422).

If a deposit is formed primarily from feasting activity, it is likely to exhibit fewer vessel types than a deposit representing everyday activity, especially in terms of utilitarian vessels employed for processing food or other products (Dabney, et al., 2004: 203). However, some feasts may be marked by the consumption of an unusual variety of foods. If different feast foods are prepared or served using different vessels or equipment, then (unless such dishes are cooked or plated together) feasts can be characterized materially by unusually varied collections of cooking and/or serving equipment (Twiss, 2008: 422). Differences in the ratios of serving, cooking, and storage vessels at various locations might indicate where an emphasis on feasting activities exits, but it must be considered that the ratios of ware categories (coarse, fine etc.) and vessel shapes may vary little between domestic and feasting sites (Blitz, 1993: 84).

The size and number of cooking vessels may be directly related to the volume of food prepared and served and, by implication, the size of the serviced social group and the variety of food-processing tasks undertaken (*ibid*.: 85). Domestic contexts are expected to represent the most diverse set of activities and thus have the greatest range of sizes and specialized feasting contexts, a more restricted range, but this is not a universal principle. Notwithstanding, if differential distributions of vessel sizes occur, then it is a justified inference to conclude that the social context of food consumption has shaped this distribution. In locations where both daily and feasting ceramics for large gatherings occur, we would expect to find multimodal size distribution of preparation and serving vessels. Difference in vessel sizes (and amplitudes) should reflect the relative size of feasting groups and the frequency or intensity of feasting for the household, corporate residence, community, or other sampling unit (Clarke, 2001: 158; Hayden, 2001: 49). Large-group feasting will generally necessitate larger cooking and serving vessels than required for smaller gatherings, but it is also possible that the requirements of large-group consumption could be met with a greater quantity of ceramics rather than larger vessels (Blitz, 1993: 85; Clarke, 2001: 160; Hayden, 2001: 40, 49, 2011: 38; Helwing, 2003: 66; Dabney, et al., 2004: 203).

The occurrence and of number of special serving vessels may, in some instances, be the only thing that is indicative of feasting (Clarke, 2001: 160; Hayden, 2001: 40; Helwing, 2003: 66). These may include open shapes used to serve food and drink and, depending on the chronological period and geographical location, closed shapes in the form of jugs (Dabney, et al., 2004: 203). Such vessels may be uncommon not (or not only) in terms of size, but in terms of style, decoration, quality, or materials (Hayden, 2001: 40, 2011: 37; Helwing, 2003: 66; Twiss, 2008: 424). In terms of decoration this can include deviations in the amount and kind of decoration or the application of designs that enhance vessel visibility in public contexts (Dabney, et al., 2004: 203; Mills, 2007; Twiss, 2008: 424).

Feasts commonly involve, and may even require, the consumption of alcohol, frequently in large amounts (Twiss, 2008: 423). Evidence indicating the consumption of alcohol at feasting events in archaeological contexts may be the presence of vessels for preparing and/or serving alcohol, such as those utilized for beer making. Evidence for alcohol consumption and potentially for drinking rituals may also consist of an abundance or structured deposition of specialized drinking vessels (Hayden, 2001: 40-41; Wright, 2004b: 137). Other intoxicants or narcotics, such as opium or cannabis, may also be consumed at feasting events. Consumption of such materials is indicated by the presence of special smoking or other narcotic paraphernalia among the remains on a site and the identification of narcotic residues (Hayden, 2001: 40-41; Helwing, 2003; 66).

3.9.7 Performative Paraphernalia and Structured Deposition

Feasts are frequently marked by singing, dancing, drama, music, oratory, or other kinds of performances. Such performances reinforce the communicative power of the feast: they concentrate attention and awareness as they intertwine the sensory (visual, kinaesthetic and/or tactile; usually aural and often olfactory as well) with the symbolic, and meld ceremony with entertainment (Twiss, 2008: 424). Feasts may, therefore, be archaeologically identifiable by the presence of dance masks or other costume elements, musical instruments, or other theatrical paraphernalia (Hayden, 2001: 40; Twiss, 2008: 424). The performative elements of specialized activities associated with feasting events may also be marked by the display or exchange of religious or ceremonial paraphernalia and prestigious items which may be associated with wealth, status, positions of leadership or the enactment (i.e. construction) of social personae (Helwing, 2003: 66; Twiss, 2008: 424; Hayden, 2011: 41). The presence or absence of religious or ceremonial paraphernalia and/or prestigious items typically used in different types of feasts can therefore provide vital evidence about the social groups involved and provide clues about the nature of the events themselves (Hayden, 2001: 40; Helwing, 2003: 66). Public displays may also be marked materially by the construction of special display facilities (Twiss, 2008: 424; Hayden, 2011: 41).

The ceremonial context of animal consumption can sometimes lead to the production and display of commemorative items. For example, it is possible that specific body parts such as the skulls, jaws or horns of the animals consumed, will be curated and displayed as trophies “in memoriam” of a feast. This indicates the importance of considering as many lines of evidence as possible when seeking to identify feasting archaeologically (Keswani, 1994: 261; Clarke, 2001: 160; Twiss, 2008: 424). It must also be considered that the purposeful destruction of religious or ceremonial paraphernalia and prestigious items via breakage, burning, permanent burial (in offerings or graves), or submersion in watery contexts, may only occur in feasting related contexts (Hayden, 2001: 40, 53, 2011: 38; Twiss, 2008: 424).

3.10 Conclusion

Historically, periodic gatherings involving pilgrimage, sacrifice and feasting played a significant role in constituting social groups and facilitating the formation, expression and affirmation of group identities. Furthermore, solidarity and cyclical feasts create, maintain and enhance cooperative relationships which strengthen in-group cohesion and/or alliances between groups. Feasts which display ‘competitive’ and ‘solidarity’ type characteristics exhibit very different material expressions, including differences in the utilization of intoxicants and luxury foods. When attempting to recognize feasting activity in the archaeological record a combination of evidence from three broad categories may be drawn upon. These fall under the headings of (a) the spatial distinction of the feasting stage or location, (b) food preparation, consumption and deposition features, and (c) structured deposition and performative paraphernalia. These categories provide a framework for exploring the comparable archaeological evidence at Durrington Walls (Wiltshire) and Newgrange in the following chapter where evidence for the occurrence of large-scale, cyclyical, solidarity-type feasts during the Grooved Ware-associated Late Neolithic is explored.

4 EVIDENCE FOR LATE NEOLITHIC-EARLY BRONZE AGE FEASTING AT NEWGRANGE IN ITS WIDER CONTEXT

4.1 INTRODUCTION

Having outlined why the winter solstice would have been of prime importance from calendrical, social and economic perspectives in the previous chapters, the aim of the current chapter is to investigate the potential evidence for winter solstice feasting at Newgrange during the Late Neolithic and establish whether the activity appears to be consistent with contemporary British evidence . As Newgrange represents the only Irish Neolithic site with a suitable faunal assemblage, it must be contextualized with reference to the evidence present in Britain. As such, before engaging with Newgrange, an overview of evidence from contemporary Grooved Ware-associated feasting sites in Britain is provided and a detailed review of evidence from Durrington Walls (Wiltshire), the quintessential Late Neolithic feasting site in Britain is undertaken. As outlined at the end of the previous chapter, discussion of the evidence at Newgrange and Durrington Walls will be framed with reference to (a) the spatial distinction of the feasting stage or location, (b) food preparation, consumption and deposition features, and (c) structured deposition and performative paraphernalia.

The Boyne Valley was undoubtedly a location steeped in calendrical importance during the Neolithic and the substantial, astronomically aligned passage tombs at Dowth, Knowth and Newgrange surely witnessed numerous large-scale gatherings. Potential evidence for commensal activities were first revealed by O'Kelly (1983) whose excavations uncovered c. 40% of the area in front of the Newgrange 1 mound. O'Kelly (1983) found Grooved Ware and Beaker pottery associated hearths, occupation debris, deposition features and part of a timber circle. The latter was also the focus of further excavation by Sweetman (1985) who also partially excavated a second timber circle to the west (1987). Most significantly, these excavations produced substantial quantities of animal bone, including 24,000-30,500 fragments from the O'Kelly excavations (van Wijngaarden-Bakker, 1974, 1986) and another 877 bone fragments from Sweetman's (1985, 1987). In an Irish context the Newgrange material is unique as, to date, no Neolithic-EBA faunal assemblages of comparable size have been discovered (McCormick, 2007a). Thus, in order to contextualize the material discovered outside Newgrange it is necessary to compare the evidence with Grooved Ware sites in Britain where numerous faunal assemblages indicative of feasting activity have been discovered.

4.2 Late Neolithic-Early Bronze Age Chronology in Ireland: An Overview

4.2.1 Late Neolithic

The Grooved Ware pottery style had emerged in northern Scotland (Orkney) by c. 3100 BC (although potentially as early as 3400 BC), and had spread to the south of England by c. 2800 BC (Ashmore, 1998; Brindley, 1999b; Garwood, 1999; Gibson, 2002: 84). The chronology of Irish Grooved Ware is still poorly understood, but it is currently estimated to have appeared in the early stages of the 3rd millennium BC and to have been in use c. 2900-2500/2450 BC (Gibson and Woods, 1997, 68; Brindley, 1999a, 1999b; Eogan and Roche, 1999; Gibson, 2002: 83-87; Sheridan, 2004a). Earthen enclosures and timber rings were the principle monuments of the Late Neolithic.

Unfortunately, few radiocarbon dates have yet been obtained from earthen enclosures, but an embanked enclosure at Scotch Street in Co. Armagh returned a date of c. 3094 -2885 cal. BC (Lynn, 1988; Cooney, 2001: 79; Sheridan, 2001: 181-184), suggesting this example may belong to an earlier stage of their development. In addition, Grooved Ware assemblages have been recovered from earthen enclosures, such as the hilltop enclosure at Longstone Cullen, Co. Tipperary (Danaher, 1973; Roche, 1995; Eogan and Roche, 1997: 138) and the double ditched circle henge at Balregan 1, Co. Louth (Ó Donnchadha and Grogan, 2010). Ó Donnchadha and Grogan (2010, 19) advanced that the similarities between the Grooved Ware from Balregan and the assemblages from Knowth (Eogan and Roche, 1997) and Ballynahatty (Hartwell, 1998, 2002) could indicate that these sites were contemporary. The multi-phase timber circle complex at Ballynahatty (Hartwell 1998, 2002) was constructed and used over an extended period c. 3080-2490 cal. BC (Gormley, 2004; Plunkett, et al., 2008). The first phase of the large outer enclosure, Ballynahatty 5, dates to between c. 3080 and 2788 cal. BC, but in general terms the dating of the site centres around c. 2700 cal. BC and it was the interior Ballynahatty 6 circle which was principally associated with Grooved Ware. The dating from Ballynahatty, which suggests the majority of activity took place c. 2700-2490 cal. BC, reflects the broader pattern of Irish timber circles as the forthcoming Bayesian modelling results cited by Lynch, et al. (2014: 66) indicate that they were mainly constructed c. 2700-2450 cal. BC.

A break in the use of megalithic tombs appears to occur during the first half of the 3rd Millennium BC with pervasive abandonment or closure of monuments. The initial phase of Poulnabrone has been modelled to have ended c. 3355-3135 cal. BC (model 3) or c. 3360-3000 cal. BC (model 4) (Lynch, 2014) and a cessation in depositions is suggested more widely by evidence from other portal tombs (Kytmannow, 2008). Similarly, Linkardstown-type burials ceased to be constructed before the end of the 4th millennium BC, with their end being modelled at c. 3355-3180 cal. BC

(Cooney, et al., 2011). There is also very little evidence for primary activity at court tombs after c. 2900 BC, with the exceptions of some western monuments (Ballyglass 2 and Rathlackan, Co. Mayo and Parknabinnia, Co. Clare), which show evidence for deposition until c. 2800-2700 cal. BC (Schulting, et al., 2012a). Cooney et al. (2011) modelled the end of the primary use of passage tombs at c. 2855-2785 (model 1) or 2860-2795 cal. BC (model 2), which suggest that deposition ceased in these and court tombs around the same time. This appears to be further confirmed by the results of additional dating projects. These include the end of use of pins at Carrowmore at c. 3305-2950 cal. BC (Bergh and Hensey, 2013a, 2013b), the latest Neolithic date of c. 3011-2887 cal. BC obtained from Baltinglass (Whitehouse, et al., 2014), the end of the main phase of burial activity at the Mound of the Hostages c. 3090-2910 cal. BC (Brindley, et al., 2005; Bayliss and O'Sullivan, 2013) and at Knowth 1 c. 3020-2920 cal. BC (Schulting et al. forthcoming).

4.2.2 Chalcolithic

The chronology of the earlier parts of Chalcolithic does not yet have the clarity that is beginning to be actualized for its later stage and the EBA, but O'Brien (2012) has advanced a three stage development of the period. An essential feature of the Early Chalcolithic c. 2550/2500-2400 BC is the first appearance of copper metallurgy. To date, no imported objects have been identified in Ireland and appeared as an already developed technology in the form of flat "trapeze-shaped" copper axeheads of Continental influence or style, assigned to the 'Castletownroche phase' (*ibid*.: 218). As noted already, wedge tombs, the majority of which occur in western areas, first appeared in the Irish landscape c. 2540-2300 cal. BC (Brindley and Lanting 1991-2b; Schulting, et al., 2008). This period also witnessed the final use of Grooved Ware and the potentially overlapping earliest appearance of Beaker pottery alongside the continued use of earthen enclosures and timber circles (see Carlin 2011; Carlin and Brück, 2012). During the Middle Chalcolithic, c. 2400-2200/2150 BC, Beaker pottery was the only ceramic used in Ireland (Brindley, 2007: 297-301) and was deposited in wedge tombs, especially those examples dated to c. 2500-2200 BC (Brindley and Lanting, 1991-2b; Schulting, et al., 2008). The 'Knocknagur phase' of Irish metalwork (Lough Ravel- and Ballybeg-type copper axes, tanged copper daggers and copper awls) has been assigned to this (and the subsequent) period with its beginning determined to have been around c. 2400 BC (Lanting and van der Plicht, 2001-2; Brindley, 2007: 297-301). It has also been argued (O'Flaherty, 2002: 373-378) that the halberd types Carn, Cotton and Clonard also appeared during the 'Knocknagur phase' phase. The first items of Irish goldwork, basket-shaped ornaments and discs, also emerged during this period and the earliest examples are believed to have appeared c. 2300 BC (Eogan, 1994: 19-21, 29-30; O'Brien, 2012: 219; Needham and Sheridan, 2014: 908, 917-918; Cahill, 2015: 26-27, 29-30).

The Late Chalcolithic, c. 2200/2150-2000 BC was a period characterized by numerous innovations and changes, but a degree of continuity from the preceding centuries is also apparent. The 'Knocknagur phase' of copper metalwork has been estimated to have continued down to c. 2000 BC and 'lunulae' have been estimated to have been added to the goldwork repertoire c. 2200 BC (Eogan, 1994: 30; O'Brien, 2012: 219; Needham and Sheridan, 2014: 909-912; Cahill, 2015: 31-33). Although the use of Beakers appears to have been in decline or had a more regionally variable distribution, the style appears to have continued throughout this period also (Brindley, 2007: 297-301; O'Brien, 2012: 217), but currently available evidence suggests that Beaker ceramics were absent from wedge tombs constructed after c. 2200 BC (Brindley and Lanting 1991-2b; O'Brien, 1999a, 2012: 217; Schulting, et al., 2008). A combination of studies by Brindley (2007: 236-295) and Bayliss and O'Sullivan (2013: 62-85) have led to a greatly refined chronology of Food Vessel, Urn pottery and burial traditions during the later 3rd and first half of the 2nd millennium BC. The practice of inhumation (in furnished graves) has been estimated to have begun c. 2195-2135 cal. BC, interment in cists to c. 2140-2085 cal. BC and the 'earlier phase' of (furnished) cremations to c. 2065-2035 cal. BC (Bayliss and O'Sullivan, 2013: 83-85). Food Vessel Bowls (c. 2110-2105 cal. BC), Food Vessel Vases (c. 2080-2045 cal. BC), Encrusted Urns (c. 2045-1985 cal. BC) and daggers of copper, followed by the first tin-bronze examples (c. 2175-2060 cal. BC) are estimated to have appeared in the Irish funerary record between c. 2200/2150 BC and c. 2000 BC (Brindley, 2007: 370-374; Bayliss and O'Sullivan, 2013: 69, 71, 73, 76-77), with the earliest appearance of tin-bronze estimated to have occurred c. 2100-2000 BC (Northover, et al., 2001; Brindley, 2007: 372).

The Chalcolithic period witnessed the re-emergence of megalithism in Ireland in the form of wedge tombs, the majority of which are located in western areas. Analysis of available dates suggests that they appeared in both the north and south sometime during the period c. 2540-2300 BC and many appear to have continued in use into the EBA (Brindley and Lanting, 1991-2b; O'Brien 1999a; Schulting, et al., 2008). Another phenomenon which began in the Chalcolithic and continued into the EBA was renewed deposition in Neolithic monuments. Such reuse has been noted among all of the major Neolithic traditions and over 50 instances have been recorded (Herity, 1964, 1987; Ó Ríordáin, 1968; Brindley and Lanting, 1991-2a; Brindley, et al., 2005; O'Sullivan, 2005; Kytmannow, 2008; Schulting, et al., 2012a; Bayliss and O'Sullivan, 2013; Mount, 2013: 184-185; Lynch, 2014; see also Carlin and Brück, 2012).

4.2.3 Early Bronze Age

The Early Bronze Age is estimated to have commenced in Ireland around c. 2000 BC with the adoption of tin-bronze as the standard metal type (Lanting and van der Plicht, 2001-2; Brindley, 2007: 370-375) and the occurrence of 'Killaha phase' metalwork (Killaha-type axes, Breaghwytype halberds, Topped Mountain daggers, miscellaneous daggers) c. 2000-1900 BC (Lanting and van der Plicht, 2001-2; O'Flaherty, 2002: 373-378; Brindley, 2007: 372). Modelling also suggests that both Vase Urns (c. 2015-1955 cal. BC) and Collared Urns (1995-1895 cal. BC) appeared during this century, with the latter ceramic tradition being assigned to the 'later phase' of cremation (which also includes Cordoned Urns) which is estimated to have begun c. 2000-1890 cal. BC (Brindley, 2007: 275-295; Bayliss and O'Sullivan, 2013: 73-74, 77). The construction of wedge tombs is believed to have ceased, and both the latest gold lunulae and Beaker pottery to have disappeared by c. 1900 BC (Eogan, 1994: 30; Brindley, 2007: 297-301; O'Brien, 2012: 217, 219; Needham and Sheridan, 2014: 909-912; Cahill, 2015: 31-33).

'Ballyvalley phase' metalwork (Ballyvalley-type axes, miscellaneous daggers) has been assigned to c. 1900-1700 cal. BC (Lanting and van der Plicht, 2001-2; Brindley, 2007: 370-375). This two hundred year period witnessed a number of significant changes in ceramic funerary traditions, particularly the 19th century BC, most notably in the decades surrounding c. 1875 cal. BC. The widespread practice of inhumation ended c. 1905-1865 cal. BC, cist burial c. 1855-1810 cal. BC, and there was a dramatic decline in the prevalence of furnished cremations c. 1845-1790 cal. BC. The majority of the Irish ceramic traditions also disappeared including Food Vessel Bowls (c. 1890-1850 cal. BC), Food Vessel Vases (c. 1870-1830 cal. BC), Encrusted Urns (c. 1875-1815 cal. BC) and Vase Urns (c. 1880-1830 cal. BC) (Brindley, 2007: 236-295; Bayliss and O'Sullivan, 2013: 69, 71-74, 77-79, 82-83, 85). Bronze daggers also stopped appearing in grave assemblages (c. 1850-1695 cal. BC) (Brindley, 2007: 370-374; Bayliss and O'Sullivan, 2013: 76-79, 82-83). The final ceramic tradition to emerge in Ireland was that of Cordoned Urns wich probably only overlaps with the Collared Urns and although they are likely to have developed prior to 1700 BC, the model for the chronology of the tradition requires further refinement. It is currently estimated to have begun c. 1785-1690 cal. BC. The chronology of the associated Bronze razors also suffers from similar inaccuracy and although the earliest examples could have been interred in graves from c. 1765-1690 cal. BC they may have appeared later (Brindley, 2007: 370-374; Bayliss and O'Sullivan, 2013: 75- 79).

The 'Derryniggin phase' of metalwork (Derryniggin-type axes, bronze razors) dates to the final centuries of the EBA c. 1700-1500 BC (Lanting and van der Plicht, 2001-2; Brindley, 2007: 370-375). It is possible that if they did not develop prior to 1700 cal. BC, the first Bronze razors were interred in graves during this period c. 1685-1630 cal. BC. One notable but minor funerary trend which occurred during this period was the reappearance of internment in cist graves during the second stage of Cordoned Urn stylistic development between c. 1745-1660 cal. BC and c. 1615-1550 cal. BC. The first of the 'late phase' ceramic traditions to disappear were the Collared Urns whose use ended in 1730-1610 cal. BC. This was followed by the end of both Cordoned Urns (c. 1605-1515 cal. BC) and bronze razor depositions in graves (c. 1600-1480 cal. BC) and the 'later phase' of EBA cremation is estimated to have ended in 1580-1485 cal. BC (Brindley, 2007: 282-295; Bayliss and O'Sullivan, 2013: 74-77, 85).

4.3 Patterns in British Late Neolithic Feasting

As noted in Chapter 2 (2.5.5) pig remains outnumbered those of cattle on sites in southern England during the first half of the 3rd millennium BC, a situation which contrasts with chronologically earlier and later sites (Figure 4.1; Serjeantson, 2011: 14-31; Allen and Maltby, 2012: 288-

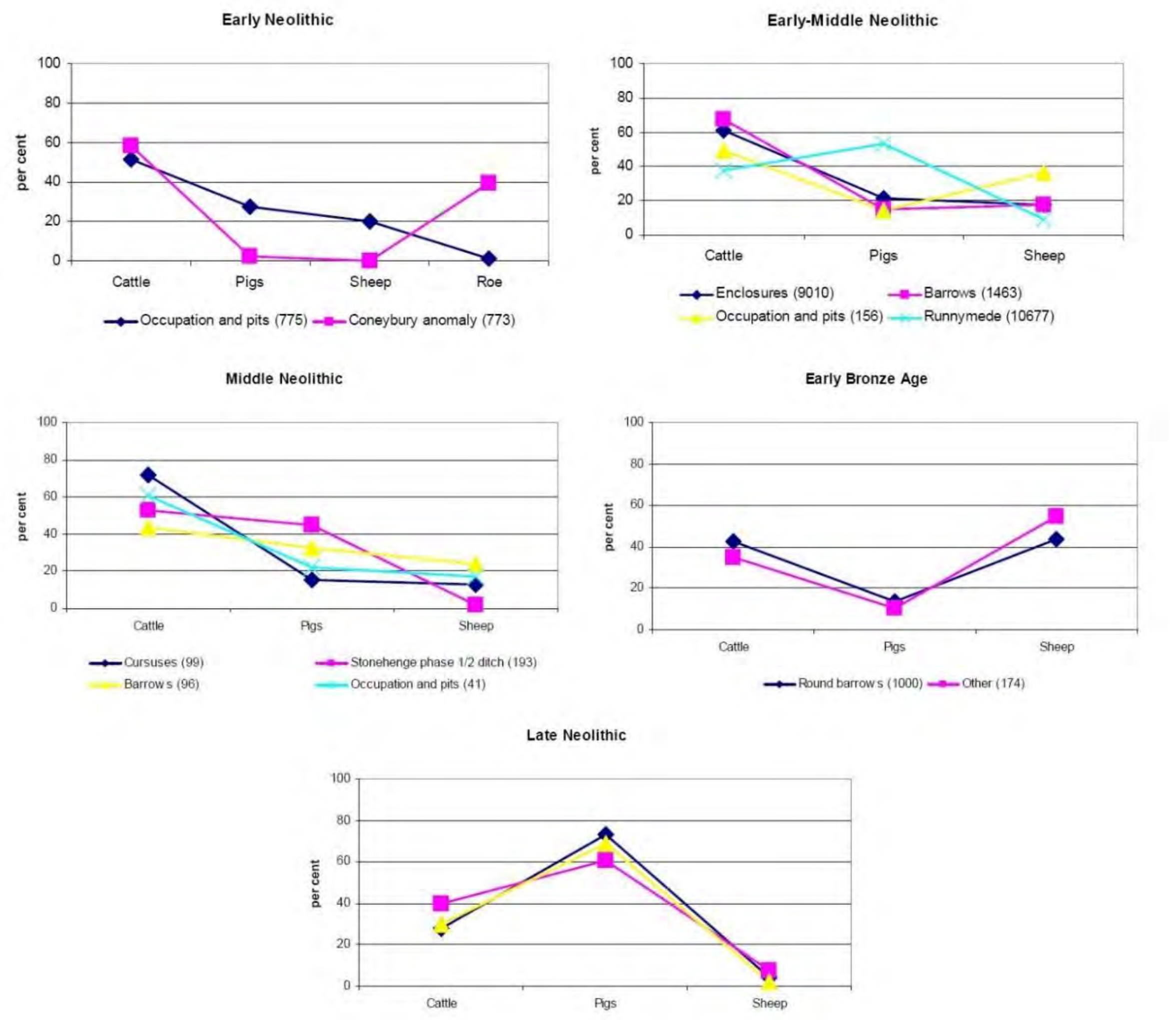

Figure 4.1: Percentage NISP of different animal species in Early Neolithic to Early Bronze assemblages in Southern Britain. (Serjeantson, 2011: Figs. 2.1-2.5)

291). Pig remains represent more than 40% of bones at most sites with Grooved Ware associations and other Late Neolithic sites. The percentages of pig represented at the large ceremonial sites do appear to vary however. For instance, at Mount Pleasant (Dorset) pig bones outnumber those of cattle, while at Marden (Wiltshire) the two species were equally represented, but in contrast pigs only composed 15% of the faunal assemblage at Wyke Down (Dorset). It should also be remembered that the predominance of pork is not ubiquitous throughout Late Neolithic Britain and there are notable exceptions at communal gathering sites. For example, in the Orkney Islands, cattle bones represent the overwhelming majority of the remains discovered to date around Structure 10 within the Ness of Brodgar ceremonial complex (Card, 2010, 2013; Mainland, et al., 2014).

Lipid analyses of Grooved Ware ceramics (Mukherjee, et al., 2008) from a combination of ceremonial and domestic sites have indicated that pottery from domestic sites had little evidence for porcine fats (3%), a significant contrast with ceramics from ceremonial sites (40%), supporting the situation indicated by faunal assemblages. For instance, at West Kennet (Wiltshire) where the faunal assemblage consisted of 73% pigs, 22% ruminants and 4% other animals (Edwards and Horne, 1997), 67% of the analysed Grooved Ware contained porcine fats (*ibid*.). It may also be notable that even at Wyke Down where pig only represented 15% of the faunal assemblage, 33% of the tested vessels contained predominantly porcine fats. This does appear to further indicate that consumption of pig products was more important at Grooved Ware ceremonial sites than on contemporary domestic settlements.

Evidence for the charring or scorching of pig and to a lesser degree cattle bones which is indicative of roasting has been identified within faunal bone assemblages at Grooved Ware ceremonial sites including Mount Pleasant and Coneybury (Wiltshire), as well as a number of other Late Neolithic sites (see Serjeantsen, 2011: Table 4.3). At West Kennet, where the vast majority of the pigs were under 2 years old at the time of slaughter, in addition to a lack of evidence for marrow extraction, c. 4-7% of the bones were burnt which may indicate that they were roasted (Albarella and Serjeantson, 2002: 43; Serjeantson, 2011: 61-62). In fact, in southern Britain the percentages of charred bones is much lower in earlier Neolithic, Beaker and Early Bronze Age assemblages than in Late Neolithic contexts and the roasting of pigs specifically appears to be restricted to sites of the latter period (Serjeantson, 2011: 60-62).

At Late Neolithic ceremonial monuments in southern Britain various groupings of animal bones and other items are commonly found suggesting formal deposition of animal remains and other material (Harcourt 1971b, 1979; Legge, 1991; Albarella and Serjeantson, 2002, 35; Thomas, 2007: 149; Serjeantson, 2011: 15, 79-81). For example, at West Kennet sherds of decorated Grooved Ware and animal bones, predominantly pig, were deposited up against the bases of posts during the construction of the palisades. Middens possibly representing single or a series of depositional events over short periods of time were recorded within both enclosures and pig bones from the deeper deposits show little evidence for having been gnawed (Whittle and Best, 1997; Serjeantson, 2011: 79). There are also indications that right hand hind-leg joints were more numerous than the left throughout the site, which appears to indicate that selected parts were consumed and deposited differentially in and around the enclosures (Albarella and Serjeantson, 2002: 43).

Examples of formal deposition may also be apparent elsewhere in Britain. For instance, although contentious, Rowley-Conwy and Owen (2011) have argued that structured deposition is identifiable in a series of Grooved Ware associated pits at Rudston Wold (Yorkshire) which produced a combined assemblage containing a broadly even representation of pig (51%) and cattle (43%), and may be the result of "structured deposition" undertaken in the context of small-scale wintertime feasting. At the Ness of Brodgar, the bone layer covering the pathway around Structure 10, formed almost entirely by cattle tibiae, represents a single depositional event or a series of events over a fairly short time period. Analysis of the tibiae suggests the presence of females/castrates with the occasional bull, and fusion indicates an emphasis on sub-adults and mature cattle. Many of the bones were broken shortly before deposition, probably for marrow extraction and the absence of paired tibiae implies that these represent joints of meat. Further evidence for "structured" depositional events at Structure 10 includes a cattle skull in the central hearth, deposition of cattle skull elements in the basal levels of the pathway, including a specimen which may have deliberately surrounded by tibiae and the whole deposit overlain by an articulated red deer (Mainland, et al., 2014).

4.3.1 Durrington Walls:

4.3.1.1 (1) The spatial distinction of the feasting stage or location

Durrington Walls is a large Late Neolithic Grooved Ware associated hengeiform enclosure located within a dry valley on the chalkland of Wiltshire close to the River Avon. It is situated c. 3.2km north-east of Stonehenge (Figure 4.2). Its final form consisted of a nearly circular enclosure, c. 470-480m across, enclosing an area of over 17ha with a 5m deep ditch and a large external bank with eastern and western entrances (Wainwright and Longworth, 1971; Albarella and Serjeantson, 2002: 33; Parker Pearson, 2007: 140-141; Parker Pearson, et al., 2006: 232, 240, 2011: 84; Viner, et al., 2010: 2813). As summerized in Table 4.1 a number of significant solar solstice alignments exist at the Durrington complex (Parker Pearson, 2007: 130; Parker Pearson, et al., 2006: 23-235, 239, 2007: 630). Parker Pearson (2007: 130, 133; Parker Pearson, et al., 2006:

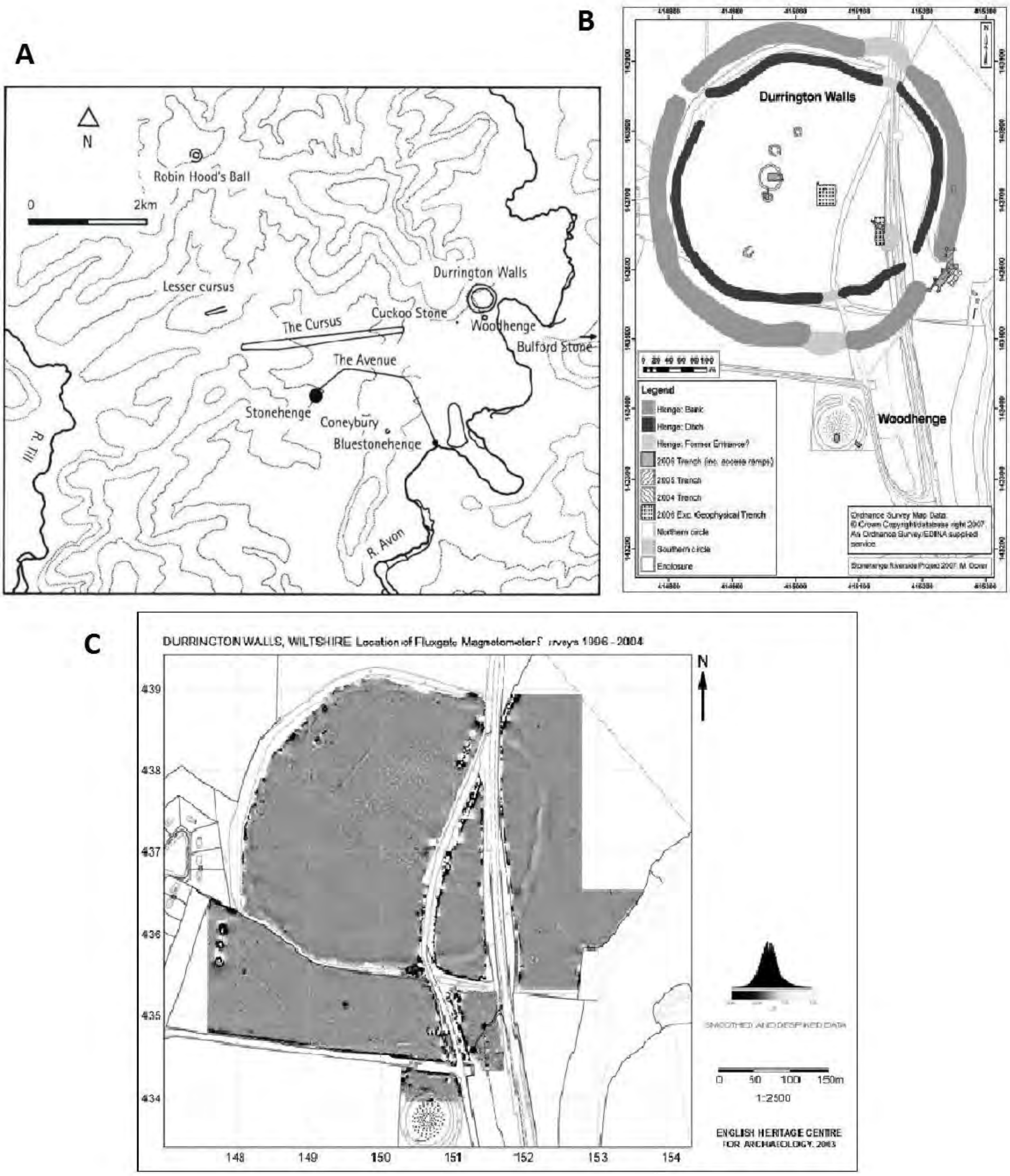

Figure 4.2: The Stonehenge landscape and plans of Durrington Walls. (A) The Stonehenge landscape with the principal monuments marked. (Parker Pearson, et al., 2007: Fig. 1.); (B) Plan of Durrington Walls, showing positions of trenches excavated in 2004 and 2005. (Parker Pearson, et al., 2007: Fig. 7.); (C) Results of the magnetometer surveys of 1996 and 2003 at Durrington Walls. (Parker Pearson, et al., 2006: Fig. 11.)

239) has drawn particular attention to the fact that the solstice orientations associated with the Southern Circle and avenue are oppositional or complementary to those of Stonehenge (Table 4.2) and its avenue and has suggested a close relationship between these monuments. He has even proposed that "Durrington Walls and Stonehenge were planned and constructed as a single

entity, with sunrise and sunset at both solstices built into the architecture of a single grand scheme" (Parker Pearson, et al., 2006: 239).

In addition to the existence of important alignments at Durrington Walls there is also some evidence for the presence of human remains and burial at the site. Some cremated bone may have been discovered beneath the bank in 1917 and a couple of Beaker-period burials were discovered outside the enclosure in 1954. Skull fragments from two adults were found in Posthole 95 of the Southern Circle and long-bones (adult, sub-adult and infant) were found in the fill of the ditch south of the east entrance during the 1967 excavation (These are more than the two human bones reported by Powers, 1971: 351). In the 2004-2006 excavations three human bones were found to the south of structures flanking the avenue at the eastern entrance and an abraded human (probably male) femur with two projectile injuries was discovered amongst the material from a pit in structure 547 (Parker Pearson, 2007: 133; Parker Pearson, et al., 2007: 633).

Site	Alignment
Northern Circle	possible mid-winter sunrise
Southern Circle	mid-winter sunrise
Avenue	within 1° of mid-summer sunset
Woodhenge	mid-winter sunset & mid-summer sunrise
Timber setting under Durrington 68	mid-winter sunrise

Table 4.1: Solstice alignments at Durrington Walls (adapted from Parker Pearson 2006, 2007; Parker Pearson, et al., 2006)

Site	Direction Facing	Alignment
Stonehenge	Looking from stone circle along avenue	Mid-summer sunrise
Durrington Walls	Looking from avenue towards timber circle	Mid-summer sunset
Durrington Walls	Looking from timber circle along avenue/towards river	Mid-winter sunrise
Stonehenge	Looking from avenue towards stone circle	Mid-winter sunset

Table 4.2: Complementray solstice alignments at Durrington Walls and Stonehenge (adapted from Parker Pearson, et al., 2006)

4.3.1.1.1 Chronology

Although there is some evidence to show that the Durrington Walls area was occupied both before and after the 3rd Millennium BC (Wainwright and Longworth 1971: 14; Albarella and Serjeantson, 2002: 33; Parker Pearson, 2007: 133; Parker Pearson, et al., 2008: 157), the Late Neolithic activity would appear to have begun with the initial construction of the 'settlement' (c. 2525-2470 cal. BC), shortly followed by the Northern and Southern Circles (c. 2490-2460 cal. BC) and the Western Enclosures (Viner, et al., 2010: 2813; Parker Pearson, et al., 2011: 83-84). The Woodhenge concentric circle and earthen enclosure and the three neighbouring structures were probably erected at this time also (Parker Pearson, et al., 2007: 628). The first phase of the Southern Circle was similar to the Northern Circle, and the Structures excavated south of Woodhenge. It consisted of four main posts, surrounded by a single post-ring, attached to an

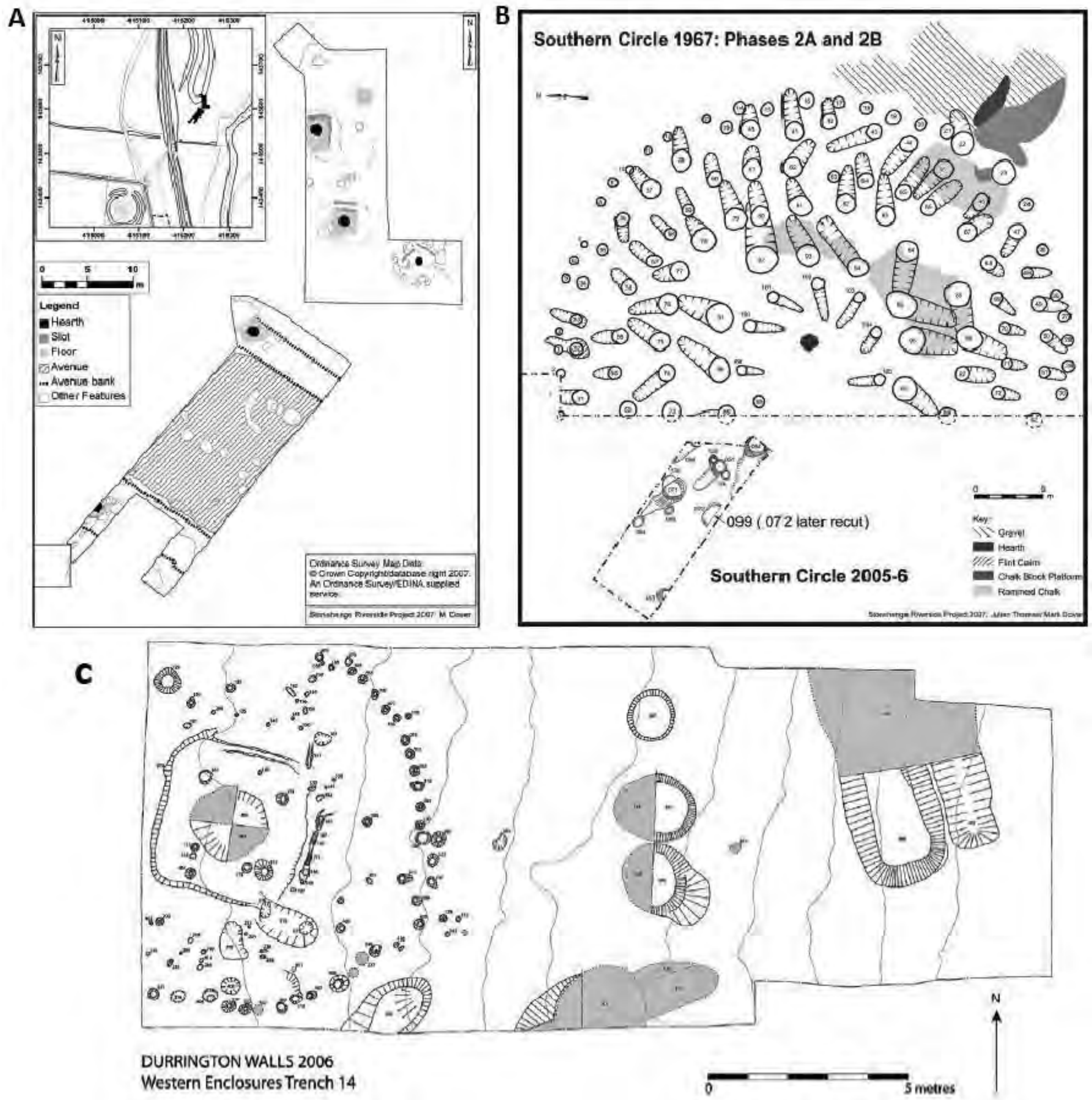

Figure 4.3: Excavations at Durrington Walls 2004-2006. (A) Plan of Durrington Walls Trench 1 showing the avenue with adjacent houses, pits and other features. (Parker Pearson, et al., 2007: Fig. 9.); (B) Plan of the 2005 trench into the Southern Circle at Durrington Walls. (Parker Pearson, et al., 2007: Fig. 8.); (C) Western Enclosures at Durrington Walls, plan of Trench 14 showing the enclosed building excavated in 2006. (Parker Pearson, et al., 2008: Fig. 16.)

avenue and façade (Wainwright and Longworth 1971: 23-38, 225; Richards and Thomas 1984; Parker Pearson, et al., 2006: 235, 2007: 630-631, 2008: 161-162, 2011: 84; Thomas, 2007: 145-152). Immediately northeast of the Southern Circle was a large structure which was later filled with midden debris and outside the circle's entrance was an avenue (170m long, 30m wide), flanked by shallow gullies inside low banks, which led to the river.

The avenue had a set of three sarsen holes along its norther-eastern edge, and further down its length was a large pit which probably held a timber post (Parker Pearson, 2007: 130; Parker

Pearson, et al., 2006: 233, 238-239, 241, 2007: 631-633, 2008: 161, 2011: 76-78, 86). The avenue (c. 2505-2465 cal. BC) was probably constructed during the Southern Circle's second phase in order to link it to the river, and a pair of structures was built upon the avenue's banks, giving the appearance of opposed gatehouses. The other five structures excavated in the eastern entrance area (Figure 4.3) may have been erected at this time also. The magnetometry survey (Figure 4.2) and layers of occupation debris detected elsewhere under the enclosure bank suggest that this 'settlement' could have extended 100m west, 200m south and north, and 300m east of the 'Western Enclosures' (Wainwright, 1971; Wainwright and Longworth, 1971; Westley, 1971; Parker Pearson, 2007: 133-141; Parker Pearson, et al., 2007: 633, 2008: 159, 2011: 76-78, 80-83; Thomas, 2007: 155; Chan, 2009: 3, 5; Viner, et al., 2010: 2813; Madgwick, et al., 2012: 735).

The Southern Circle's second phase consisted of a concentric circle (the four innermost of which resembled that of Stonehenge phase's 3ii-3iv) with eastern facing 'spiral'-shaped entrance passage (Wainwright and Longworth, 1971: 23-38, 225; Richards and Thomas 1984; Parker Pearson, et al., 2006: 235, 2007: 630-631, 2008: 161-162, 2011: 84; Thomas, 2007: 145-152). It has also been suggested (Parker Pearson, et al., 2008: 161, 2011: 84) that the 'settlement' was probably in use for less than half a century and potentially as little as 7-12 years based upon evidence of floor re-plastering and plaster-extraction pits, if these tasks were performed annually. The 'settlement' ended c. 2480-2440 cal. BC and the ditch and bank of the enclosure were constructed c. 2485-2455 cal. BC (Viner, et al., 2010: 2813; Parker Pearson, et al., 2011: 83-84). The ditch and bank (which contained Beaker pottery), post-date the majority of activity in the area of the east entrance.

A final phase of Chalcolithic occupation is indicated by an occupation layer deposited against the bank on the south side of the enclosure, but the points at which the southern and northern enclosure entrances were blocked remains unclear. The avenue remained in use, as the turf line only formed towards the end of the 3rd millennium BC. The Woodhenge timber circle could have been enclosed by the bank and ditch (c. 2480-2030 cal. BC) at the same time as the Durrington Walls enclosure was constructed, although it could have occurred subsequently (Stone, et al., 1954; Parker Pearson, 2007: 133; Parker Pearson, et al., 2007: 628, 635, 2008: 159; Chan, 2009: 2). The Southern Circle may have been a focus of long-term activity. Some of the posts were inserted after others had entirely rotted and the massive timbers would have taken 170-200 years to decay (Wainwright and Longworth, 1971: 23-38, 225; Richards and Thomas, 1984; Parker Pearson, et al., 2006: 235, 2007: 630-631, 2008: 161-162, 2011: 84; Thomas, 2007: 145-152).

4.3.1.2 (2) Food preparation, consumption, and deposition features

4.3.1.2.1 Hearths and Middens

The structures situated within the two excavated 'Western Enclosures' and those flanking the avenue (Figure 4.3) all had centrally located hearths as did the Southern Circle, and a 5m-long hearth was located immediately outside its entrance (Parker Pearson, et al., 2006: 235, 2007: 631, 633, 2011: 86). Pits containing dense deposits of animal bone, pottery and flint arrowheads were associated with the structures at the eastern entrance (Parker Pearson, 2007: 135-139; Parker Pearson, et al., 2008: 159) and animal bones, Beaker pottery, flint and bone artefacts, and flint waste, were deposited in the re-cut pits of the Southern Circle (Parker Pearson, et al., 2006: 241-242, 2007: 631; 2008: 162-163; Thomas, 2007: 149-151). Midden deposits consisting of black organic soil with ash, burnt flint, worked flints, animal bones and ceramic sherds were located between the five houses on the north side of the avenue and others were identified further north beneath the enclosure bank and on the south side of the avenue. The large structure near the Southern Circle was also filled with midden debris (Parker Pearson, et al., 2011: 84, 86). These assemblages may represent a combination of domestic refuse and remains from communal events. The presence of articulated remains and low levels of gnawing suggests many of the bones were buried rapidly, but others had corroded surfaces implying they were disposed of in different ways, or lay closer to the ground surface. Gnawing marks are more frequent on cattle than pig bones, which may be indicative of differing disposal patterns (Albarella and Serjeantson, 2002: 33, 39).

4.3.1.3 Faunal Assemblage

The animal MNI provided by Harcourt (1971b) was 85 cattle (28%), 198 pigs (63%), 6 sheep/goat (1.9%), 5 dogs (1.6%), 14 red deer (4.5%) and 5 other wild fauna (1.6%) from 8500 bones. In addition Albarella and Payne (2005: 593) identified three potential wild boar bones from the assemblage. The total amount of usable meat from these animals amounts to 37,145kg (Mount, 1994: 440). In addition to those remains, c. 80, 000 animal bones were recovered during the 2004-2007 excavations. Preliminary analysis indicated that most are the bones of pigs and cattle in a ratio of 10:1. The other species present include red deer, roe deer and aurochsen (Parker Pearson, et al., 2011: 86, 88). To date no comprehensive MNI estimates have been published, meaning additional analysis is not possible at this stage.

The fusion of the main limb bones of the Durrington Walls cattle is consistent with Harcourt's (1971) suggestion that most bones belonged to mature animals. However, a few calf bones have been identified, suggesting Harcourt could have underestimated the presence of juvenile cattle

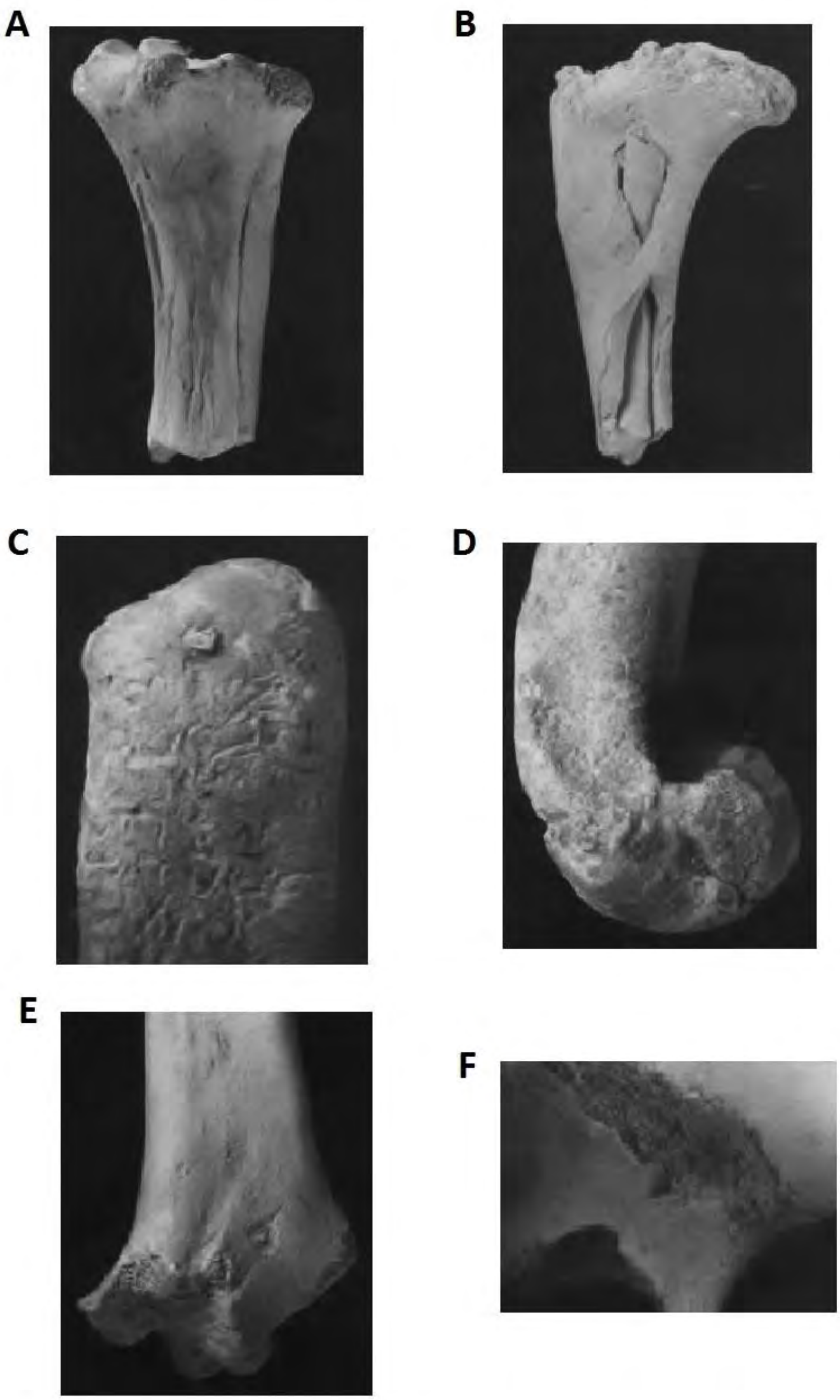

Figure 4.4: Selection of animal bones from Durrington Walls (not to scale) (A) Cattle radius burned and chopped mid shaft. (Albarella and Serjeantson, 2002: Fig. 5.9.); (B) Pig humerus with rib stuck in its internal cavity. (Albarella and Serjeantson, 2002: Fig. 5.11.); (C) Pig humerus with embedded arrow tip. (Albarella and Serjeantson, 2002: Fig. 5.15.); (D) Pig femur with embedded flint. (Albarella and Serjeantson, 2002: Fig. 5.16.); (E) Pig calcaneum with embedded stone. (Albarella and Serjeantson, 2002: Fig. 5.17.); (F) Cattle femur with embedded flint (detail). (Albarella and Serjeantson, 2002: Fig. 5.14.)

(Albarella and Serjeantson, 2002: 36-37). Evidence points towards a roughly equal representation of male and female pigs within the 1967 assemblage (Albarella and Payne, 2005: 591-592). They had an average shoulder height of 71cm, which is not much taller than the earliest European domestic pigs and they were relatively small compared to wild boar (van Wijngaarden-Bakker, 1974: 338; Albarella and Payne, 2005: 592-593; Serjeantson, 2011: 26). Further analysis of bone and tooth sizes has suggested that they were probably from a "single population" (Albarella and Payne, 2005: 592-593). Although there are some inconsistencies in the data, evidence indicates that most of the Durrington Walls' pigs were slaughtered when they were between the second half of their first year (9-10 months old) and the third year (Albarella and Serjeantson, 2002: 35-36; Albarella and Payne, 2005: 590-591; Parker Pearson, et al., 2011: 86). The ages of pig slaughter indicate a mid-winter slaughter pattern. On-going analysis of the 2004-2007 assemblage has confirmed this seasonal spike and has identified a second less marked summer culling period. Summertime activity is also indicated by the large proportion of dairy lipid residues identified at the site, as the highest milk yields would have been during the summer months (Albarella and Payne, 2005: 590; Parker Pearson, et al., 2011: 86).

4.3.1.3.1 The Presence/Absence of Anatomical Elements

There was no discrepancy between numbers of left and right hand animal bones at Durrington Walls, but a number of other disparities were identified within the faunal assemblage. For instance there are indications that beef cuts that included relatively few limb extremities were imported to the site (Albarella and Serjeantson, 2002: 37). The scarcity of skulls which was noted by Harcourt (1971b) and proportionately low numbers of cattle teeth recovered compared to bones (Albarella and Serjeantson, 2002: 37) may support such a conclusion, but it is also feasible that cattle skulls were deposited elsewhere on the site or were removed entirely. A number of anomalies have been observed within the distribution of pig body parts. Those of younger animals are more or less equally represented suggesting they arrived on the trotter, but skulls from older specimens are frequently absent, which could indicate that these arrived as dressed carcasses and joints of meat, which may also account for the varying numbers of leg bones represented. However, it is also possible that some skulls were discarded in unexcavated areas of the site or were removed entirely (*ibid*.: 37-39, 43). Albarella and Serjeantson (2002: 46) suggest the complete carcasses of young pigs may have been more specifically associated with the feasting, while the butchered carcasses of the older pigs and cattle with smaller-scale consumption at more regular intervals.

4.3.1.3.2 Transport of Animals

Strontium isotope studies have been carried out on both cattle and pig teeth from Durrington Walls and the results indicate that at least some of the animals consumed there were brought to the site from distant places. Thirteen cattle teeth from the eastern entrance area have been analysed. Two of the animals could have been reared locally. However, they could have come from North Yorkshire, the east coast, the midlands, or parts of the southeast. A second subgroup (eight animals) originated at least 30km away from the site and were either raised in central England, in a southern and eastern coastal region, or southern Devon or Cornwall. Another subgroup (two animals) were reared at least 90-100 Km away and could have come from Devon, Cornwall, Wales or as far north as Cumbria. One animal is most likely to have originated in central Wales and the final specimen, was probably reared within the Malvern Hills area (Gloucestershire), but could have come from as far away as Cumbria or Scotland (Viner, et al., 2010: 2815-2818). Strontium isotope analysis has also been carried out on five Durrington Walls pig teeth. The results suggested that three of the specimens could have been raised in the local area. The other two were of non-local origin and were probably from central England, southern Devon or Cornwall (Madgwick, et al., 2012: 738).

4.3.1.3.3 Arrowheads and Archery

A particularly notable feature of the Durrington Walls worked flint assemblage (retouched flakes, scrapers, denticulates, notched flakes, awls, knives and arrowheads) is that the ratio of arrowheads to scrapers is much higher than nearly all other excavated Neolithic enclosures in Britain (Wainwright and Longworth, 1971; Richards and Thomas, 1984: 197, 204; Parker Pearson, 2007: 142; Chan, 2009: 1, 4). Re-analysis of the animal bones from the 1967 excavations identified a cattle femur and three pig bones with impact injuries containing the broken-off tips of flint arrowheads (Figure 4.4) and several more flints embedded in bone were identified during preliminary analysis of the 2004-2008 assemblage. The injuries resemble hunting damage and at least some animals were shot from a distance (Albarella and Serjeantson, 2002: 43-44; Chan, 2009: 4; Parker Pearson, et al., 2011: 86).

4.3.1.3.4 Meat Preparation and Cooking

Butchery evidence in the form of chopping and cut marks was frequently and clearly visible on both cattle and pig bones (Figure 4.4). However, pig carcasses were less intensively butchered than usual, were frequently consumed in large portions, and there was a high frequency (20%) of complete long bones. Several hundred articulated pig and cattle bones were recovered and evidence for marrow extraction is notably absent from pig tibiae, but a few pig bones were both burnt on the mid shaft and chopped. Additionally, one pig humerus (Figure 4.4) had a rib tightly stuck in its internal cavity for marrow extraction and other pig bones had similar holes. Cattle bones showed evidence for burning most commonly on the mid-shaft and pig bones were often burnt in well-defined and predictable anatomical areas, which is indicative of roasting. However, it is unclear whether the animals were roasted whole or were cut into slabs of meat (Albarella and Serjeantson, 2002: 39-43; Parker Pearson, et al., 2011: 86).

The pottery assemblage from the site is predominantly Grooved Ware, with smaller numbers of Grooved Ware with Beaker-style decoration and Beaker vessels (Wainwright and Longworth, 1971: 71-73; Parker Pearson, et al., 2006: 235, 2007: 635). The current distribution across the site is limited to areas that have been published. Beaker was restricted to the re-cut postholes of the Southern Circle, the midden within the nearby structure and the enclosure ditches (Parker Pearson, et al., 2007: 635). It is however currently unclear if Beaker was recovered from the eastern entrance area or the 'Western Enclosures' and in what contexts the Grooved Ware with Beaker-style decoration was discovered (Richards and Thomas, 1984: 197; Parker Pearson, 2007: 141). Lipids analysis of Grooved Ware and Beaker pottery from the 1967 excavation revealed that most had contained dairy products, while the remainder were split between ruminant (probably beef) and pork fats. Most of the vessels containing dairy residues were discovered within the vicinity of the Southern Circle. There were also indications that different foodstuffs were prepared or served in different sized vessels. The dairy residues were found in both the smallest (under 22cm diameter) and largest (30-35cm diameter) vessels and ruminant residues only from pots of intermediate size (22-30cm diameter). However pork residues were found in all vessel sizes (Parker Pearson, et al., 2011: 86). Clearly meat was both roasted and boiled or stewed at Durrington Walls. Notably, evidence for roasting implies that these animals were slaughtered for immediate consumption rather than salting or curing. Boiling or stewing is a much more economical form of cooking since the meat can be cut into smaller pieces and bulked out with liquids and other ingredients. It also makes the toughest potions edible (including game meats) and a nutritious fatty broth is released from boiled bones. It is also an appropriate form of cooking for large-scale feasting as boiled or stewed food can easily be prepared and distributed while additional animals or cuts are roasted (Sherratt, 2004: 314; Wright, 2004b: 160; Parker Pearson, et al., 2006: 230; Serjeantson, 2011: 60).

4.3.1.4 (3) Structured Deposition and Performative Paraphernalia

4.3.1.4.1 Structured Deposition

Richards and Thomas, (1984: 204-214) claimed (a) that they detected differences in the distribution of species and anatomical elements across the site, (b) that many "exotic" species were found in the South Circle, and (c) that the bones of wild and domestic species were treated differently. However, the original report (Harcourt, 1971b) noted no such differences and re-analysis of the spatial distribution (Albarella and Serjeantson, 2002: 44-45) showed Richards and Thomas' distributional analysis to be unreliable. Insofar as the present labels can be relied upon, the domestic and wild animals were not restricted to certain areas of the site. Nevertheless, evidence for structured deposition has been identified at Durrington Walls. For instance, at the 'Western Enclosures' there is at least one potential instance for structured deposition. This occurred within the 40m enclosure where a pit (307) contained the carefully deposited remains of at least two pigs, which displayed numerous instances of articulation (Thomas, 2007: 155). Parker Pearson (2007: 133, 135-138, Parker Pearson, et. al, 2007: 633, 2008, 159) has also noted potential acts of structured deposition within some of the structures (851, 547 and 772) located by the avenue at the eastern entrance which may have associated with their abandonment.

To date, the most extensive evidence for structured deposition comes from the Southern Timber Circle. It had been thought that the pits dug into the decayed posts were weathering cones formed in the tops of the rotted posts into which artefacts and animal bones had fallen (Wainwright and Longworth, 1971: 24-25, 396-401). However, it has now been determined that these represent re-cut pits, dug once the posts had decayed, with various combinations of animal bone, Beaker pottery, flint and bone artefacts, and flint waste deposited within them. Richards and Thomas (1984: 204) noted that bone pins when deposited within re-cut post-holes were not deposited in association with flint artefacts and that an opposition existed between transverse arrowheads and bone pins which were deposited on either side of the entrance respectively. Within the pits excavated in 2005 and 2006 animal bone predominated, but flint occurred as clusters of waste, often higher in the fill, and in all instances the pottery sherds were almost exclusively in the upper part of the re-cut fills. Those pits located opposite the entrance produced much smaller quantities of cultural material than those facing toward the avenue and the river. The exception to this pattern within the re-cut pits are antler picks (in both 1967 and 2005-6 features the majority were found in the primary post-packing). The overall distribution suggests they were preferentially deposited in significant locations within the overall structure including the entrance and the area directly opposite it (Parker Pearson, et al., 2006: 241-242, 2007: 631, 2008: 162-163; Thomas, 2007: 149-151).

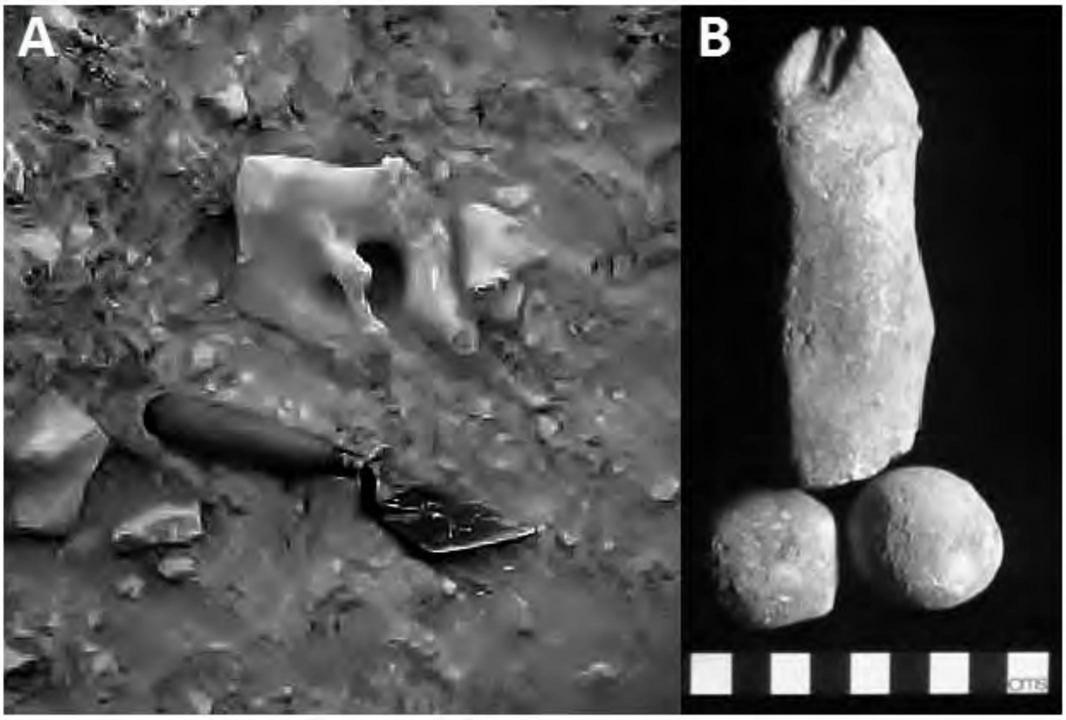

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Figure 4.5: 'Fertility symbolism' at Durrington Walls. (A) Pit outside the east entrance which contained the flint phallus and balls, with embedded natural flint 'vagina' (Parker Pearson, et al., 2006: Fig. 19.); (B) The flint phallus and flint balls from the fill of a pit (Parker Pearson, et al., 2006: Fig. 18.)

4.3.1.4.2 Performative Paraphernalia

At Durrington Walls the most obvious performative paraphernalia present are bone pins which have been found predominantly in association with the Southern Circle (Richards and Thomas, 1984: 204). A number of "genital-shaped" flints discovered at Durrington Walls could also represent performative paraphernalia. These include a number of naturally phallic-shaped flint nodules which were recovered from the avenue gully and the ground surface of the Southern Circle. Possible confirmation of this suggestion comes from a pit outside the east entrance which contained a flint phallus and balls together with what was interpreted as a pelvis-shaped flint nodule with a hole suggestive of a vagina (Figure 4.5; Parker Pearson, et al., 2006: 239-240, 252-253).

4.3.1.4.3 Underrepresentation of Skulls

As noted above, the significant under-representation of cattle and adult pig skulls appears to be a genuine phenomenon at the site. A number of possible explanations that could account for this pattern exist. Firstly, it is possible that these anatomical elements were never present on the site because some of the remains represent curated animals and cuts rather than complete specimens or because the missing skulls were discarded in unexcavated areas of the site. However, it is also possible that the skulls were put on display in locations which have not yet been investigated or that they were removed from the site entirely (Harcourt, 1971b; Albarella and Serjeantson, 2002: 37-39, 43).

4.4 THE BOYNE VALLEY EVIDENCE: LATE NEOLITHIC-EARLY BRONZE AGE (EXCLUDING NEWGRANGE)

The majority of the evidence for earlier Neolithic activity in the Boyne Valley, most conspicuously identifiable in the form of passage tombs, centres around the Knowth, Dowth and Newgrange areas spread ascross the southern valley, with an additional minor concentration occurring in the Monknewtown area in the north-western part of the valley (Figure 4.6). During the subsequent Late Neolithic-Early Bronze Age periods a greater variety of monument forms appear in the Boyne Valley, but these continued to be sitied around the areas focused on during the earlier Neolithic (Figure 4.7). Evidence for Late Neolithic-EBA activity around Knowth, Dowth and Monknewtown will be outlined below before attention switches to Newgrange.

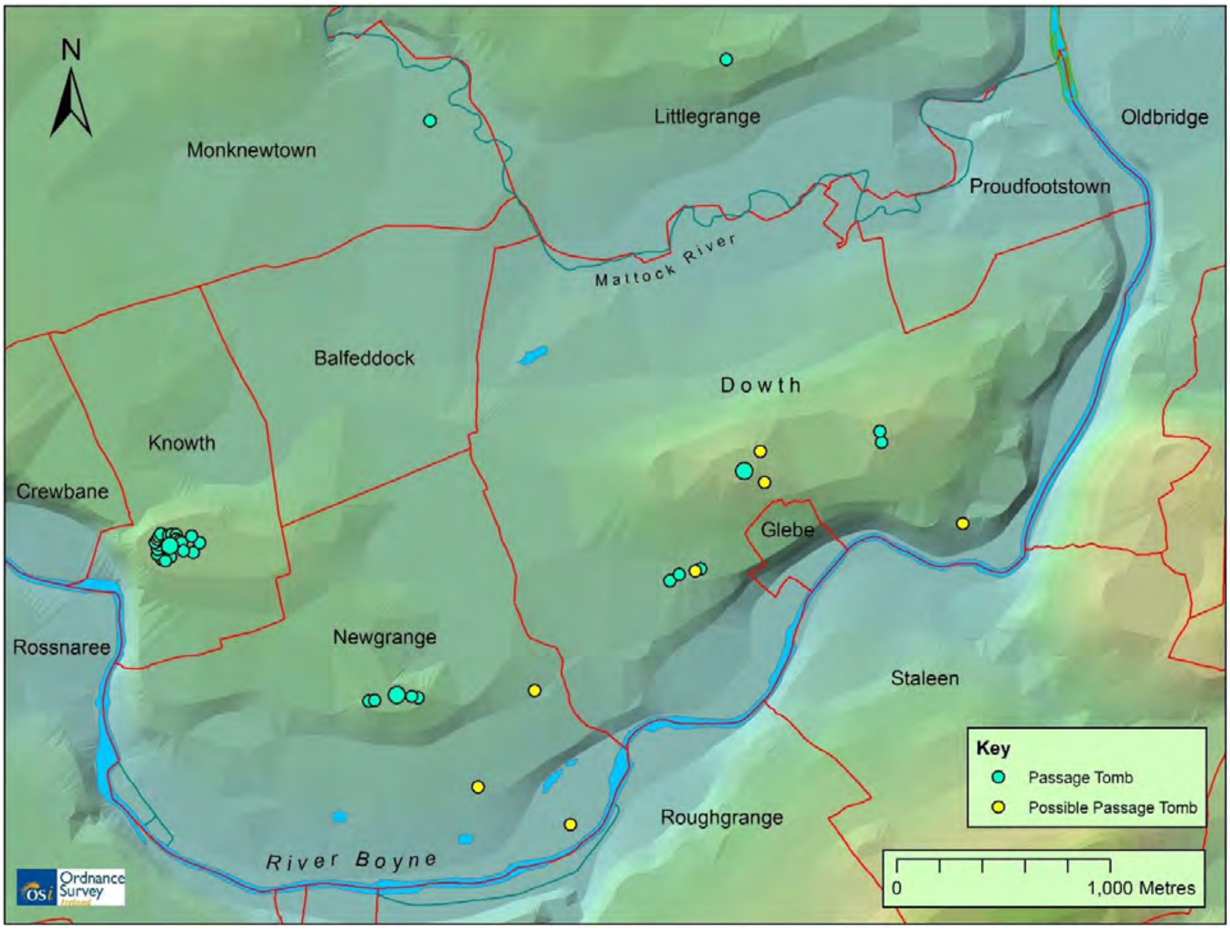


Figure 4.6: Distribution of passage tombs in the Bend of the Boyne (image by author and Joe Fenwick NUIG, © Ordnance Survey Ireland core data. All rights reserved. Licence number NUIG230615; Lidar data reproduced courtesy of The Discovery Programme, The Heritage Council and Meath County Council.)

A Grooved Ware associated timber circle (Figure 4.8; Eogan and Roche, 1994, 1997: 101-196, 220-221) was located 12m outside the entrance to the eastern tomb of Knowth 1. This structure was defined by a single ring of post-pits measuring 8.37m by 7.15m, wich had a central four-post setting and an eastern 'porch-like' entrance (Eogan and Roche, 1997: 101-106). Organic residues on pottery from this structure have produced dates of 2873-2581 cal. BC and 2611-2581 cal. BC (Schulting, et al., forthcoming). Further Late Neolithic activity (Eogan and Roche, 1997: 197-211) excavated at the site included the presence of Grooved Ware within two 'occupation' areas (Beaker Concentration A, and a slight presence at Beaker Concentration C) and depositions within Passage Tombs 6, 15 and 18 (Figure 4.8). 'Beaker Concentration A' was located to the north-east of Knowth 1 and 'Beaker Concentration C' was on the south-western side (Eogan, 1984: 245-260, 270; Eogan and Roche, 1997: 197-203, 206-210).

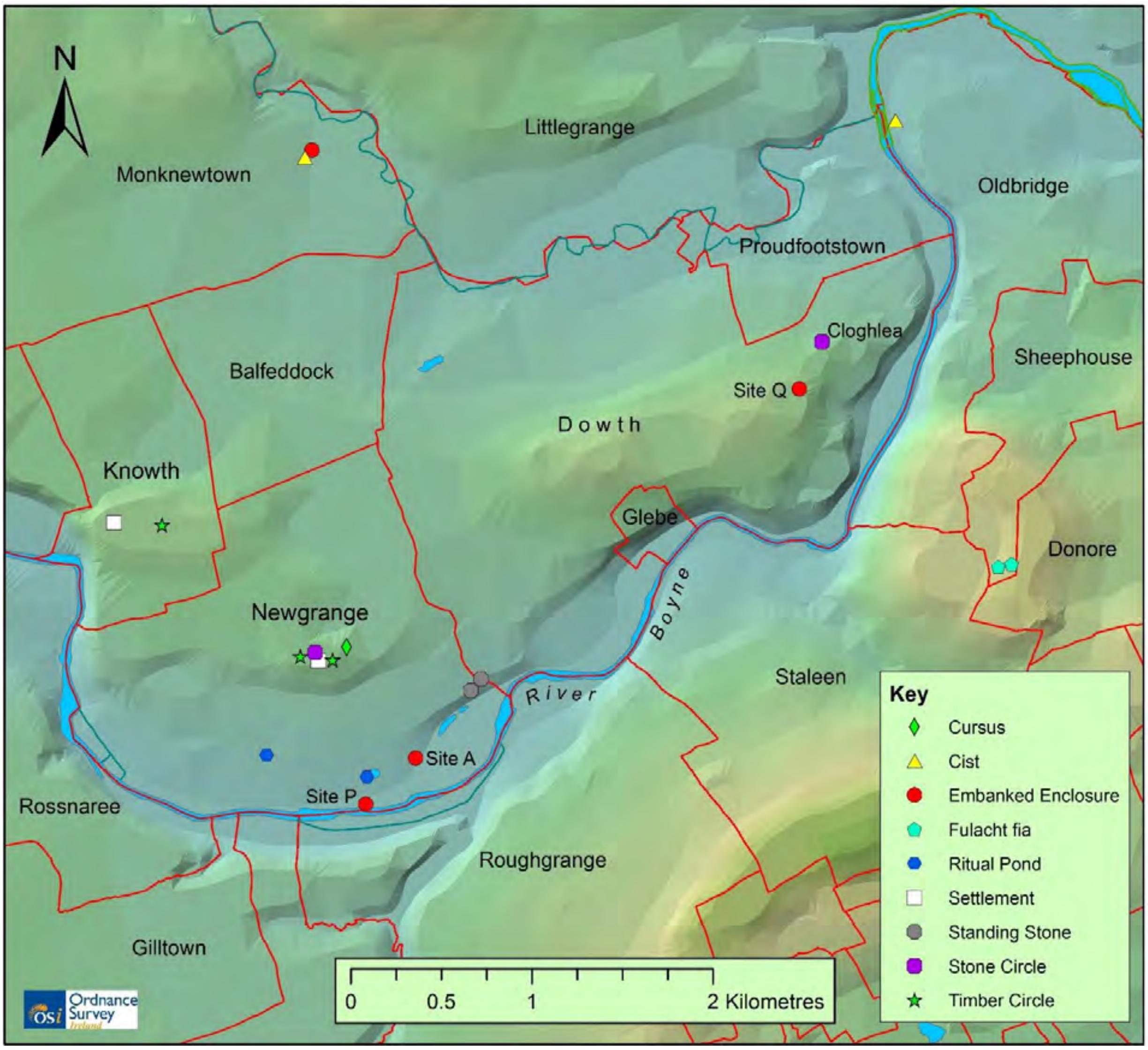


Figure 4.7: Late Neolithic/Early Bronze Age sites in the Bend of the Boyne (image by author and Joe Fenwick NUIG, © Ordnance Survey Ireland core data. All rights reserved. Licence number NUIG230615; Lidar data reproduced courtesy of The Discovery Programme, The Heritage Council and Meath County Council)

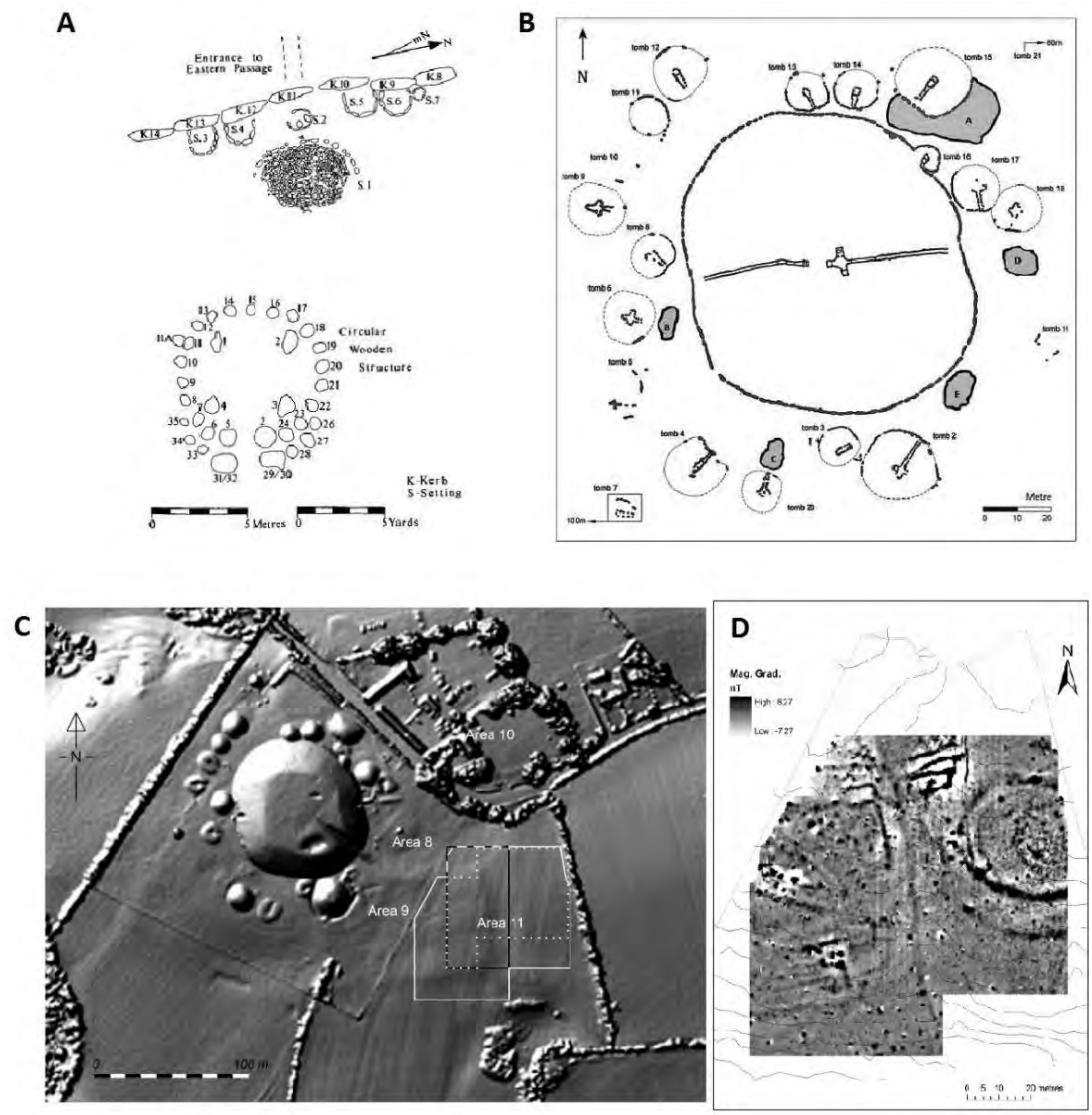


Figure 4.8: Late Neolithic-Chalcolithic activity at Knowth. (A) Location of the timber circle within the entrance area of the Eastern Passage Tomb 1 (Eogan and Roche, 1997: Fig. 20.); (B) Location of the five large Beaker associated deposits (Concentrations A-E) within the complex (Carlin, 2011: Fig. 3.9); (C) LiDAR image indicating the location of Area 11 to the southeast of the core complex (Fenwick, 2012: Fig. A8.1.); (D) Fluxgate gradiometer survey of Area 11 indicating presence of enclosure (Fenwick, 2012: Fig. A8.3.)

A burial in the right-hand recess of Passage Tomb 6 consisted of highly decorated Grooved Ware sherds around the edge of a cremation deposit. Although it was not possible to distinguish which bones were part of the burial as it overlaid primary passage tomb cremated bone, and merged with it (Eogan 1984, 312, fig. 118; Eogan and Roche, 1997: 211; Roche, and Eogan, 2001: 127), three radiocarbon dates suggest this may have been a single depositional episode c. 3089-2910 cal. BC and it could indicate early Irish Grooved Ware activity (Schulting, et al., forthcoming). It had been thought that an undecorated Beaker accompanied the cremated bones of an adult and child interred within the passage of Tomb 15 (Eogan, 1984: 308-312; Roche and Eogan, 1997: 255, 2001: 132), but recently a longbone fragment from the adult (Schulting, et al., forthcoming) produced a date of c. 2912-2877 cal. BC, indicating the burial is Late Neolithic. Undecorated Grooved Ware sherds were found mixed within a burial deposit overlying the flagstone in the left-hand recess of Tomb 18 (Eogan, 1984, 312-313; Eogan and Roche, 1997: 211; Roche, and Eogan, 2001: 127-128), but recent dates suggest the vessel was not associated with the burial (Schulting, et al., forthcoming).

In addition to the excavated evidence, geophysical survey in the area to the south-east of the Knowth passage tombs has identified a concentric multiple-ring enclosure with an estimated maximum diameter of c. 70m (Figure 4.8; Fenwick, 2012: 819). Fenwick (*ibid*.: 825-828) has discussed a number of potential interpretations for this monument, including the possibility that this enclosure is of Late Neolithic date, which could in fact be the most feasible scenario (Fenwick pers. comm.) and in fact the Grooved Ware timber ring was no more than 100m to the west-north-west of the multiple-ring enclosure. It has been advanced that if these two monuments are contemporary (Fenwick, 2012: 827-828) the 22m diameter circular feature at the centre of the multiple-ring enclosure could represent the outline of substantial timber circle, with a putative 'monumental' eastern entrance. A series of contiguous circular anomalies may represent an outer timber circle or palisade trench.

The majority of the Beaker activity at Knowth is a series of occupation deposits, 'Concentrations A-E' (which included sherds from 293 Beakers and c. 1500 lithics), around the tombs and particularly focused around Knowth 1 (Figure 4.8; Eogan, 1984: 245-322, 331-346; Eogan and Roche, 1997: 223-255; Roche and Eogan, 2001). It had been believed that a Beaker burial was interred within Tomb 15 close to Concentration A (Eogan, 1984: 308-312; Roche and Eogan, 1997: 255, 2001: 132), but as noted above recent dating of the remains (Schulting, et al., forthcoming) has shown that the burial and undecorated Beaker represent separate depositions. Evidence for Bronze Age activity at Knowth is extremely limited and to date there are no indications of an EBA presence. What has been identified includes a date of c. 1513-1269 cal. BC from the "dark layer" of 'Beaker Concentration A' (Eogan and Roche, 1997: 202) and a small assemblage of sherds from three MBA vessels (Roche and Eogan, 1997: Vessels 51, 59 and 60; Eogan, 2012: 9, 686-687; Roche, 2012) and a bronze sickle blade tip from Area 5 (Eogan, 2012: 11-12).

Within the Dowth complex Late Neolithic and Chalcolithic activity is suggested by Dowth Henge (Site Q), the largest and best-preserved embanked enclosure in the Boyne Valley, which is sited on gently sloping ground overlooking the River Boyne at the east of the complex (Eogan and Grogan, 1991: 111; Stout, 1991: 259; Condit, 1997b: 22-23) and a V-perforated button discovered in the

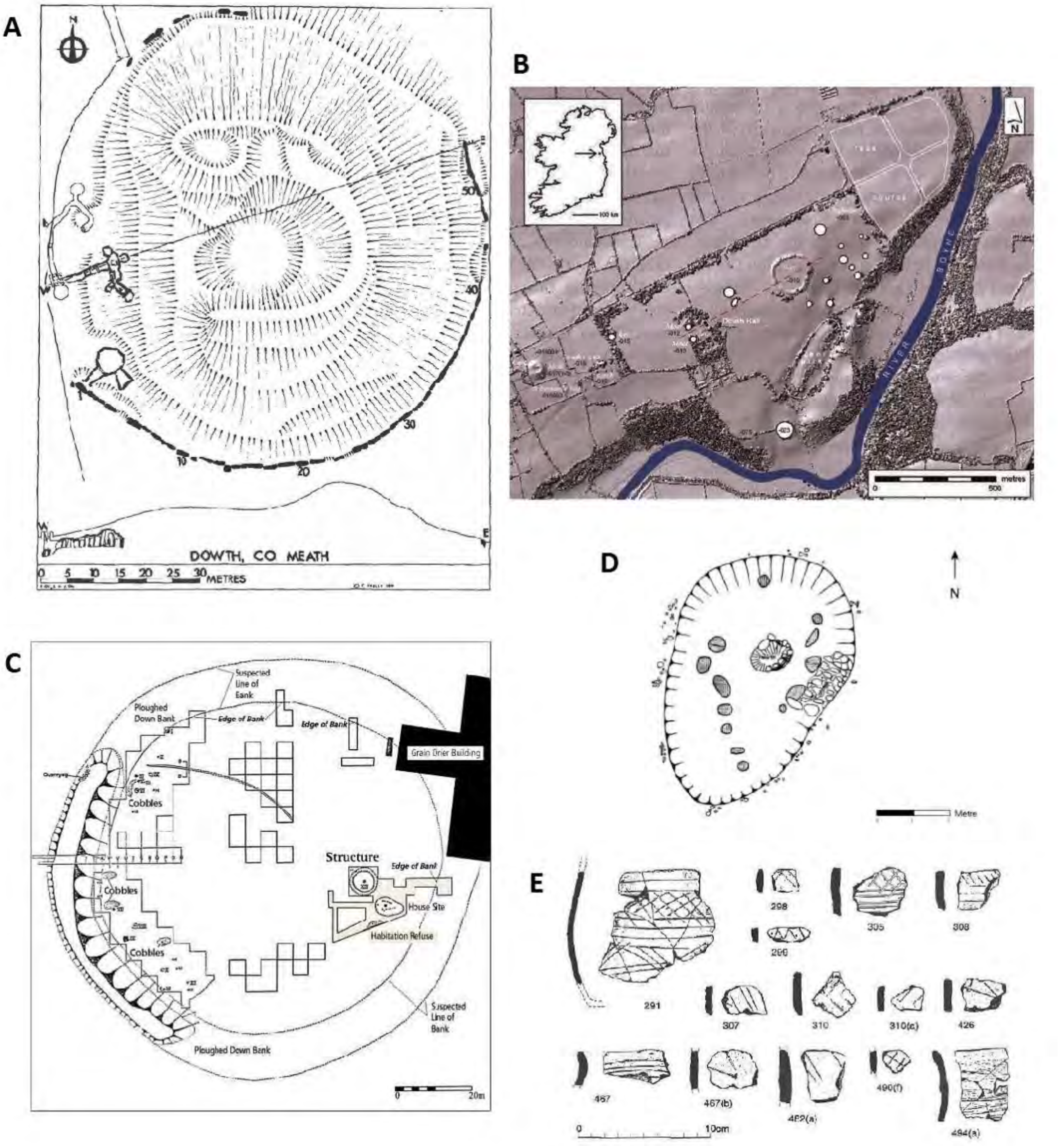


Figure 4.9: Dowth and Monknewtown. (A) The tumulus and chambers of Dowth (O'Kelly and O'Kelly, 1983: Fig. 3.); (B) Location of possible 'enclosures'in the Dowth demesne area (Fenwick, 2013: Fig. 1.); (C) Plan of the Monknewtown embanked enclosure (Carlin, 2011: Fig. 3.6.); (D) plan of the alleged Beaker-associated structure at Monknewtown (Carlin, 2011: Fig. 3.8.)

passage tomb (Wilde, 1857: 122; Harbison, 1976: 14). The dating and precise morphological nature of the destroyed 'stone circle' at Cloghalea is unknown, but it could also have dated to the 3rd millennium BC. Definitive evidence for a Bronze Age presence is absent, although the seven circular 'enclosures' identified to the east of Dowth Q (Figure 4.9; Davis, et al., 2010a: 29-30; Fenwick, 2013: 26) could represent the remains of barrows or ring-ditches rather than follies (Fenwick, pers. comm.), but they may not pre-date the Iron Age.

Late Neolithic-Chalcolithic activity has also been recorded c. 2-3 km north of the passage tomb complex at Newgrange to the south of the River Mattock at Monknewtown close to a passage tomb (Site S) (Sweetman, 1976; 28-34; Roche and Eogan, 2001: 135). This includes the artificial 'ritual pond' (Site W) (Meenan, 1997; Condit and Simpson, 1998: 59-62) and another possibly similar example has been identified in the field immediately to the south (Brady, et al., 2010: 133). Small-scale augering in Site W produced an earliest date of 2701-2469 cal. BC, confirming the likelihood that it was first constructed during the Late Neolithic (*ibid*.: 142-143). Grooved Ware associated habitation layers occur within the Monknewtown embanked enclosure (Site V) (Figure 4.9; Sweetman, 1976: 79-88; Stout, 1991: 245-284; Roche and Eogan, 2001: 133-135; Eogan and Roche, 1999), which also enclosed a possible Beaker-associated structure (Figure 4.9; Sweetman, 1976: 36-39), a cist containing a cremation and a food vessel bowl (Waddell, 1970, 127, 1990, 128) and a series of LBA cremation burials, one of which was located within a ring-ditch (Sweetman, 1976: 28-34).

Outside the valley itself, Grooved Ware period activity is suggested on the northern side of the Boyne by the presence of an embanked enclosure at Stackallan (Stout, 1991) between the Boyne's confluence with the Blackwater at Navan and Slane, but the date can only be confirmed through excavation. Grooved Ware activity has been documented near the confluence of the Mattock and Boyne, the most extensive of this being located at Balgatheran (Ó Drisceoil, 2009) where a series of 'circular houses' and a timber circle were identified close to earlier Neolithic activity (Campbell, 2002). Nearby Grooved Ware activity was documented at Coolfore where a small pit circle was recorded in an area containing earlier Neolithic occupation (Ó Drisceoil, 2007) and according to Ó Drisceoil (2007, 2009) a series of stake-built structures, possibly representing temporary dwellings, at the Hill of Rath (Duffy, 2002) may also be contemporary. Beaker occupation evidence, has been documented close to the Mattock/Boyne confluence at the Hill of Rath, where there appears to have been extensive Neolithic activity (Brindley, 2000; Duffy, 2002) and at Oldbridge 3 (Seaver, 2008). Downriver towards the mouth of the Boyne at Mell activity included occupation features and a partially stone lined grave. This burial containing a prone female adult inhumation (c. 2490-2200 cal. BC) accompanied by animal bone and two convex scrapers (McQuade, 2005; Roche and Grogan, 2005a). During the EBA activity continued around the Mattock/Boyne confluence (Coffey, 1893-6; Haddon, 1896-8; Ó Ríordáin, 1958; Lucas, 1970: 152; Waddell, 1990: 113, 128) and included what could have been a sizable cemetery on the summit of the Hill of Rath (Smith, 1840-4; Wilde, 1857: 150, 190, 192; Gógan, 1929; Waddell, 1990: 111-113).

On the southern side of the Boyne Valley Grooved Ware activity has been recorded at Rathmullan Site 13 (Bolger, 2002: 8-9), and in the coastal area between the mouth of the Boyne and the River Nanny occupation evidence and a timber circle at Donacarney Great (Carlin, 2011: 174-175) included a possible ‘square structure’, while a timber circle was documented nearby at Bettystown (Eogan, J., 1999). To the south near the mouth of the River Nanny another timber circle was located at Ninch (McConway, 2002). To the south between the mouth of the Boyne and the River Nanny evidence for Beaker occupation has been recorded at a number of sites situated close to a tributary of the River Nanny (O' Carroll, 2004; Gallagher, 2009; Grogan and Roche, 2010b) and in the Rathmullan area (Bolger, 2001a, 2001b, 2001c, 2003a, 2003b; Nelis, 2002; Stafford, 2002; Grogan and Roche, 2011a, 2011b) and Beaker sherds were found deposited in pits and postholes of the timber circle at Donacarney (Carlin, 2011: 174-175, 187). Continued activity south of the Boyne is indicated by the presence of EBA burial activity (Waddell, 1990: 123; Eogan, 1999).

4.5 NEWGRANGE, CO. MEATH

4.5.1 (1) The spatial distinction of the feasting stage or location

Newgrange can certainly be characterized as a special location as ceremonial activity at the site and elsewhere around the ‘Brú na Bóinne’ complex in Co. Meath, dates back to the first half of the 4th Millennium BC. It is likely that the passage tombs at Newgrange were constructed c. 3350-2900 cal. BC, as indicated by dates obtained at Tomb 16 and the substantial Newgrange 1 (Figure 4.11; Eogan, 1984, 125; Eriksen, 2008, 261; Cooney, et al., 2011: 651; Lynch, et al. 2014). The earliest Neolithic activity recorded at Newgrange is a 'Western Neolithic' pottery associated ‘occupation’ layer discovered under ‘satellite’ Tomb L and a possible circular structure beneath Site Z located to the west and east of Newgrange 1 respectively (Figure 4.10; O'Kelly, et al., 1978: 263-269, 293-297, 332-335; Eogan, and Grogan, 1991: 107; Grogan, 1997: 30). It has been advanced (Cooney, 2000: 156) that Site K located at the western end of the ridge and Site B, on the lowest terrace above the River Boyne, were the earliest passage tombs to be constructed at Newgrange.

A second construction phase involved the erection of Site L to the east of Site K. Newgrange Site 1 was constructed in phase three and it has been suggested (Figure 4.10; O’Kelly, et al., 1978: 252, 343; O’Kelly, 1982: 115, 128; Cooney, 2000: 156) that both Site Z located to the to the south-east of Newgrange 1 and the unexcavated Site Zi (Figure 4.10), could both have been constructed in a fourth phase and thus represent the final elements of passage tomb construction of the site. The scale of this Boyne Valley complex and the presence of the large astronomically aligned passage tombs indicate it was probably of inter-regional importance during the Middle Neolithic and the winter solstice sunrise alignment at Newgrange 1 suggests the site was the focus of periodic

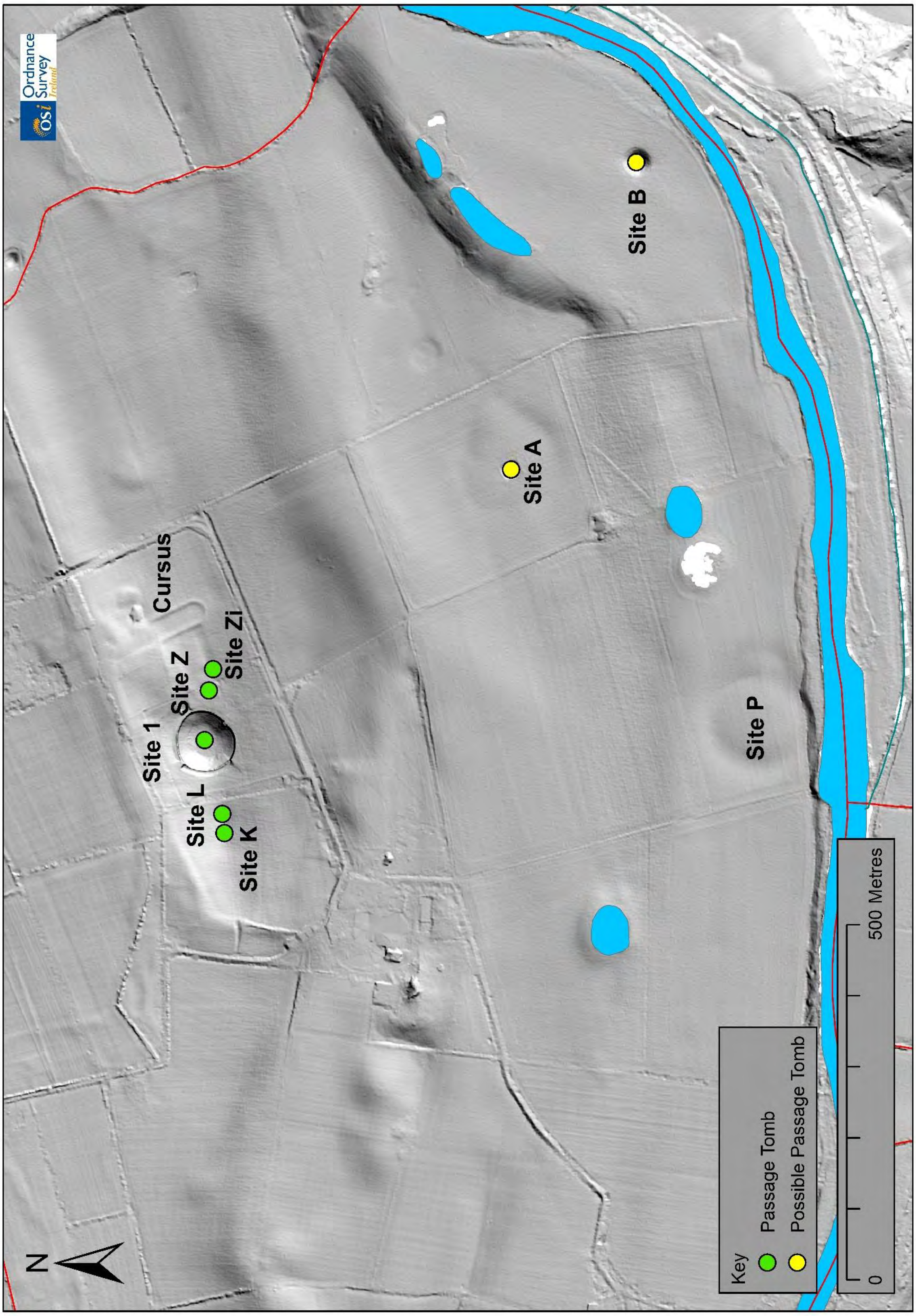


Figure 4.10: Distribution of passage tombs within the Newgrange Complex. Embanked enclosures A and P and cursus are marked. (image by author and Joe Fenwick NUIG, © Ordnance Survey Ireland core data. All rights reserved. Licence number NUIG230615; Lidar data reproduced courtesy of The Discovery Programme, The Heritage Council and Meath County Council)

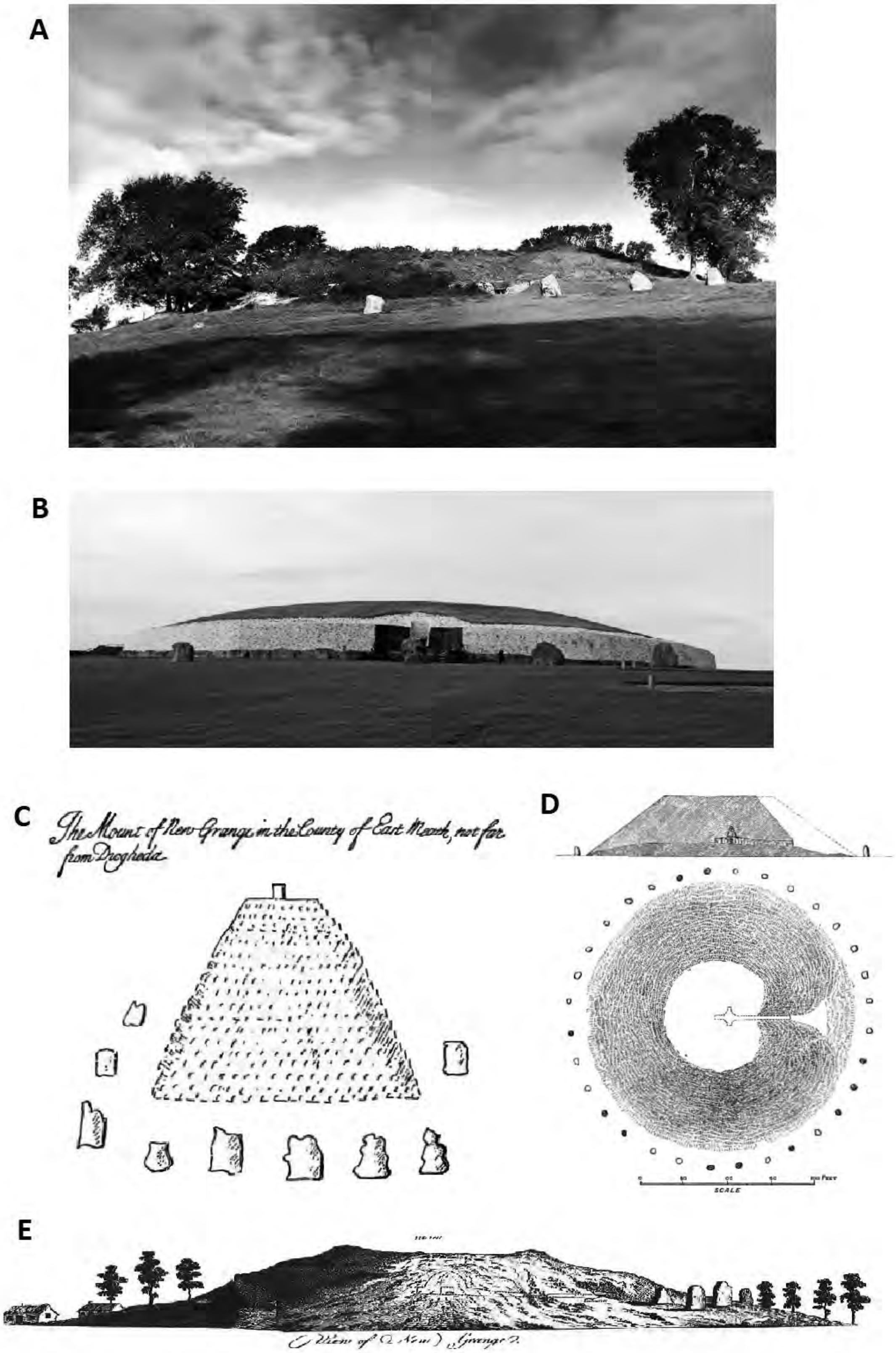


Figure 4.11: Various images of Newgrange 1. (A) Newgrange as it appeared prior to 1962 (Eriksen, 2008: Fig. 17.); (B) Newgrange today as "reconstructed" (Eriksen, 2008: Fig. 1.); (C) The earliest known drawing of the Newgrange mound, probably produced by Edward Lhwyd in 1699 (Eriksen, 2008: Fig. 9.); (D) Section and ground plan of Newgrange, published in 1872 by James Fergusson (Eriksen, 2008: Fig. 2.); (E) Drawing of the Newgrange mound by Charles Vallancey in 1776 (Eriksen, 2008: Fig. 13.)

gatherings during the winter months. The continued importance of this area into the Late Neolithic, Chalcolithic and Early Bronze Age is indicated by the presence of timber circles, embanked enclosures (Sites A and P) and a cursus monument (Stout, 2002), a number of which could have had astronomical alignments. For example, Newgrange Site A has an eastern entrance (Stout, 1991: Fig. 3) suggesting orientation towards the rising sun in spring (March/April) and autumn (September/ October) and potentially upon the equinoxes.

It may be advanced that the triangular stone (Stout and Stout, 2008: 15) and the low oval setting and platform (O'Kelly, 1973: 140-141, 1982: 76) outside the Newgrange 1 entrance were constructed shortly after the mound was completed and the standing stone which was once on the top of the mound (Stout and Stout, 2008: 15) could also have been erected at this time, but Eriksen (2008) has suggested that this could have occurred after the Early Bronze Age activity on the site. Like other possible Irish cursus monuments (see also Newman, 1995; Davis, et al., 2010a: 32-34), the specimen at Newgrange (Condit, 1995, 1997b; Stout, 2002: 33-34; Eriksen, 2008: 269-270) has not been excavated, so its chronological position is unclear. It has been advanced that in Britain cursus monuments were constructed from potentially as early as c. 4000-3800 BC (Thomas, 2006) and that the majority of the substantial examples were probably constructed c. 3650-3350 BC (Barclay and Bayliss, 1999; Bradley, 2007: 65). However, there are indications that some later monuments were constructed during the last quarter of the 4th Millennium BC (Condit, 1995: 16; Gibson, 1998: 31-32; Brophy, 1999; Whittle, 1999: 59-60, 71-72; Bradley, 2007: 64-66). Based on the dates from Britain a tentative construction phase of c. 3350-2900 BC may be postulated for the Newgrange cursus and if not earlier, would probably place construction at the same time as Newgrange 1 or shortly later, possibly around the same time as the construction of 'satellite' tomb Site Z upon which it is aligned (Figure 4.10).

Much of the Grooved Ware and Beaker associated activity revealed by O'Kelly (1983) outside the main passage tomb occurred just beyond a quartz/granite layer which extended over a c. 100m length (between K21 and K79) and was at its thickest around the entrance to the tomb (O'Kelly, 1982: 90-91). Eriksen (2008) argued that it formed by accumulation while the monument was in its 'second form' (Figure 4.12), but it has been established (Lynch, et al., 2014: 66-67) that a terminus post quem for the spread of quartz at the back of the tomb (outside K79) was c. 2564-2298 cal. BC. This section of 'quartz spread' lay directly on the sub-soil (outside/against kerbstones, on top of packing and subsoil) at the rear of the monument, was outside the kerb and extended eastwards (intermingled with cairn stones, but no granite) from K79 as far as K74 where they tail-off before disappearing around K71 (see below for further discussion). Both Eriksen (2006, 2008) and Cooney (2006) have argued that O'Kelly's (1982: 72, 110) interpretation and

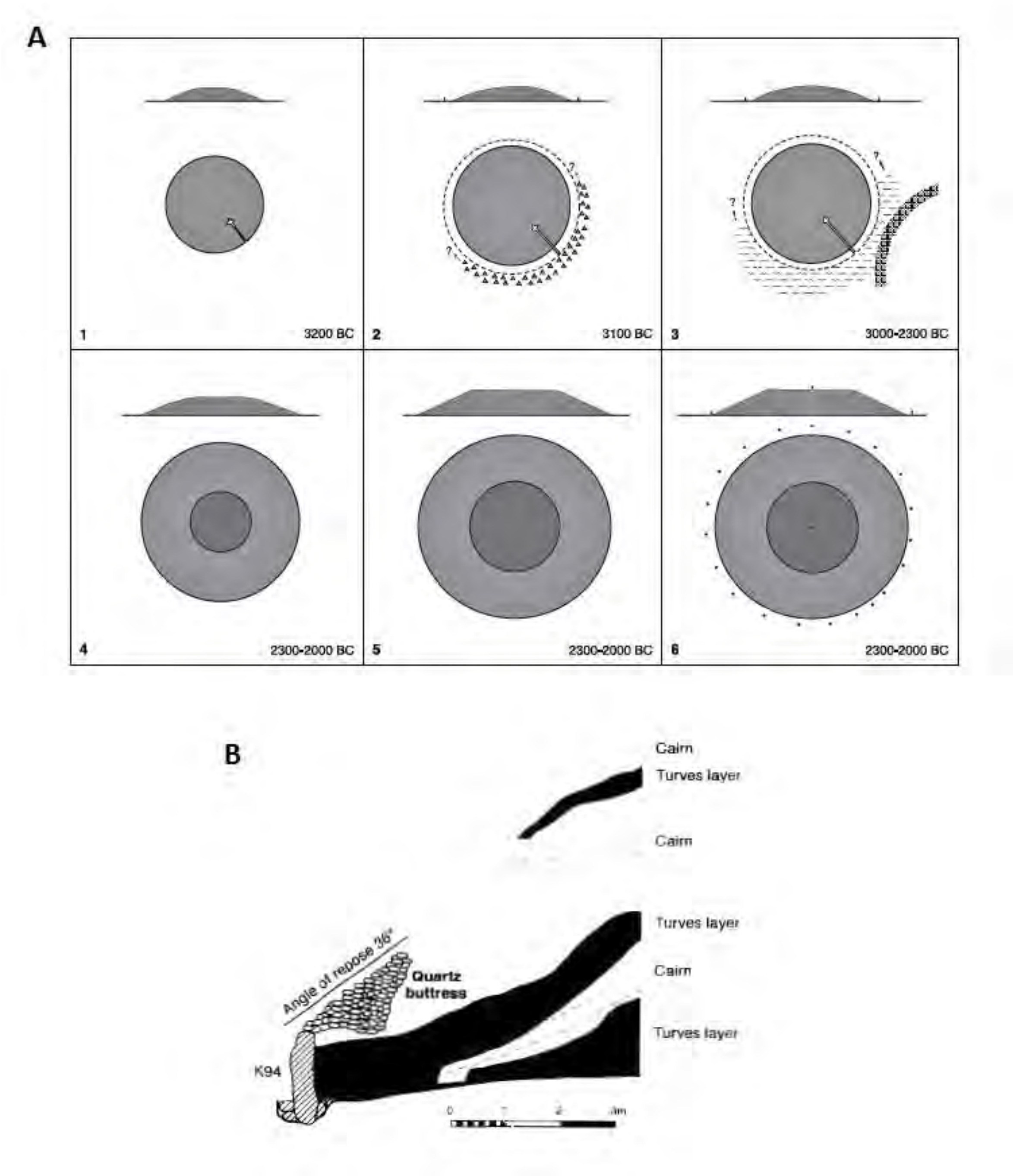


Figure 4.12: Suggested phasing at Newgrange and alternative reconstruction of how the quartz could have been utilized structurally. (A) The six construction phases at Newgrange as proposed by Eriksen (Eriksen, 2008: Fig. 11.); (B) Theoretical quartz "buttress" structure above the kerb advanced by Stout (Stout and Stout, 2008: Fig. 3.)

reconstruction of the Newgrange 1 monument with a vertical wall of quartz is incorrect. They both contest that the quartz and granite formed a platform around the kerbstones on the ground outside the entrance area of the monument. Cooney (2006: 705) argued that because the northern edge of the eastern timber circle respects the edge of the quartz/granite layer (O'Kelly, 1983: 12-13) then the latter must have been in place when the Late Neolithic Grooved Ware associated circle was erected, but this cannot have been the case if the quartz feature was a single phase entity, because as noted above, evidence (Lynch, et al., 2014: 38-40, 66-67) indicates that the deposition of the quartz layer at the rear of the monument occurred during the Chalcolithic at the earliest. However, it should be noted that it does appear that the timber circle was visible during the Chalcolithic. Stout and Stout (2008: 4) believe the quartz was situated above the kerb as a low, wide buttress sloping back at the angle of repose, holding back the cairn and turf layers (Figure 4.12). A possible argument against the idea that either a buttress or wall ever existed is that no quartz, with the exception of a few chunks was noted within the cairn at the rear of the monument (Lynch, et al., 2014: 36, 38, 65-67). If there had in fact been an embellished façade, be it a vertical wall or a sloping buttress in form, it has been suggested that this feature either collapsed naturally or was deliberately destroyed (Simpson, 1988: 35; Meighan, et al., 2002: 33).

A bank of yellow clay overlay some of the activity excavated by O'Kelly (1983) outside Newgrange 1, particularly in the western part of the site and it was re-interpreted as part of a series of constructions created to enclose the tomb (Cooney, 2006: 705-706). As mentioned already, a partially excavated (O'Kelly, et al., 1978; O'Kelly, 1983: 17-21; Sweetman, 1985) timber circle (70m external diameter) was discovered to the southeast of Newgrange 1 (Figure 4.20). It was composed of three concentric rows of pits and post-holes and enclosed occupation evidence and a small passage tomb (Site Z). The full extent of the monument and a number of associated features including what appears to be an extended post avenue was revealed through magnetic gradiometry and susceptibility surveys (Smyth, 2009, 34; fig. 1.35). Carlin (2011: 188) has noted this possible entrance feature is similar to that which leads from the wooden enclosure into the timber circle at Ballynahatty in Co. Down. The second partially excavated timber circle (Figure 4.21), located to the west of Newgrange 1, was formed by two almost concentric arcs of pits and postholes (20m and 13m in diameter respectively) (Sweetman, 1987; Carlin, 2011: 185). In addition to the Grooved Ware 'occupation' and timber circles and Beaker-associated activity located around Newgrange 1 further Late Neolithic-Chalcolithic activity within the complex is suggested by the presence of embanked enclosures, Sites A and P (Figure 4.10; O'Kelly, 1968: 114-119; Stout, 1991: 268-271; Condit, 1997b). Site A encloses a flat-topped burial mound presumed to be a passage tomb (Stout, 1991: 248; Condit, 1997b) and both are located on a terrace above the River Boyne, Site P being located c. 370m south-west of Site A. In addition, a possible artificial pond (ME019–067003), which could be of Late Neolithic date, has been identified to the south of Newgrange 1 (Brady, et al., 2010: 133).

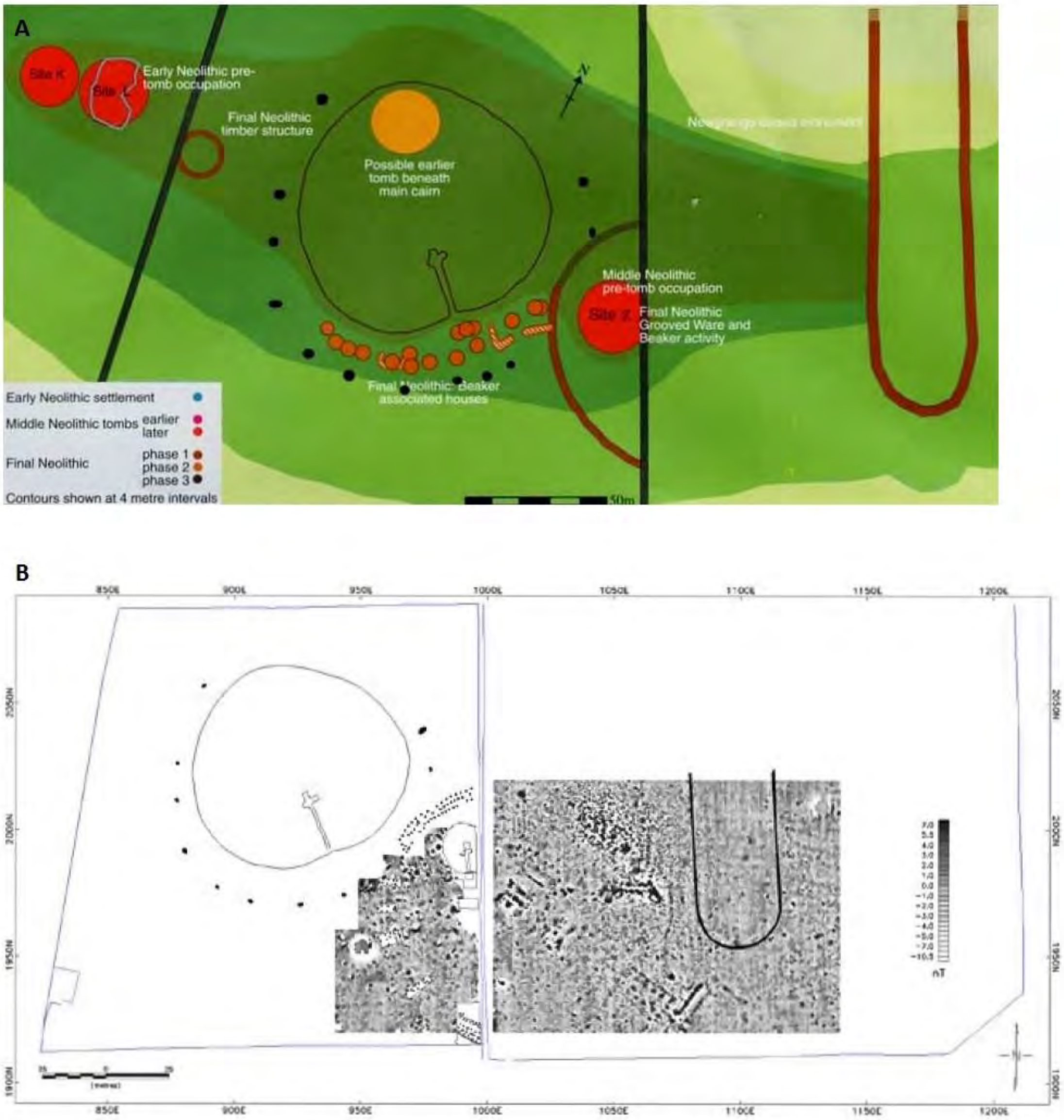


Figure 4.13: Plans of the Late Neolithic-Early Bronze Age activity at Newgrange. (A) Schematic plan of the Late Neolithic-Early Bronze Age activity at Newgrange (Carlin, 2011: Figure 3.2.); (B) Magnetic gradiometry survey to the east of the Newgrange passage tomb highlighting unexcavated areas of the eastern timber circle and an alignment extending from the south-west of the cursus towards Site Z (Smyth, et al., 2009: Fig. 1.35.)

4.5.1.1 Chronology: Late Neolithic-Early Bronze Age activity at Newgrange

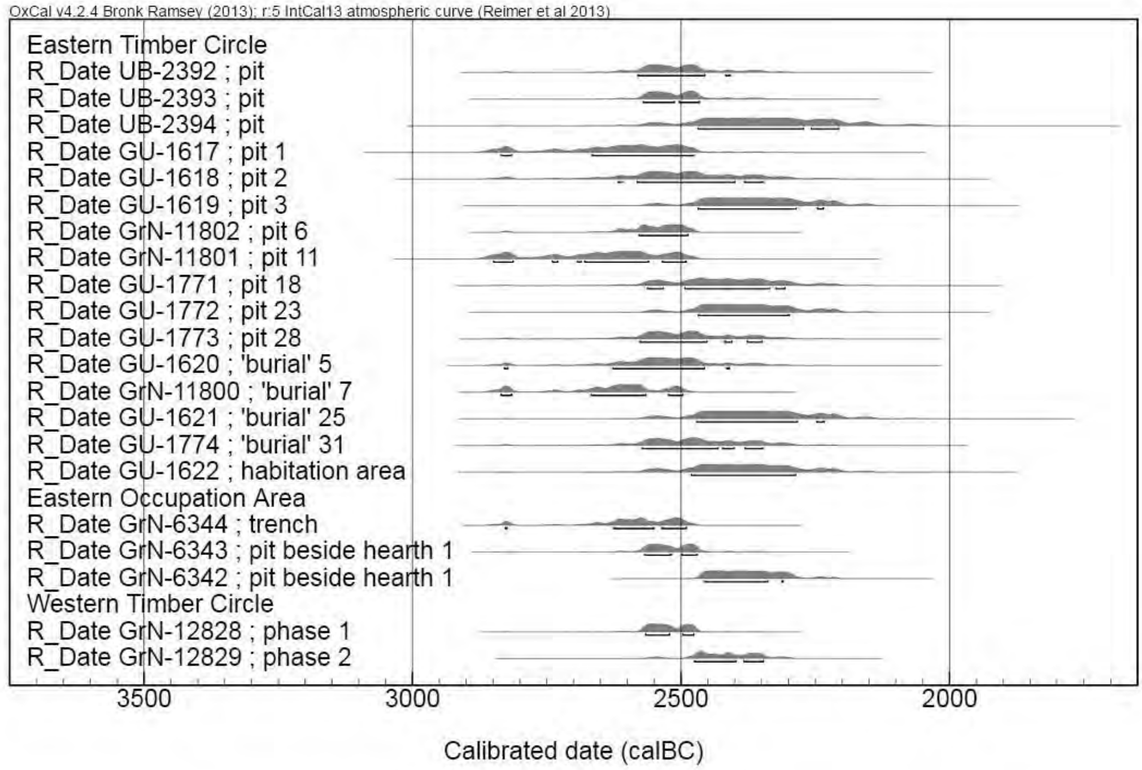
Overall, the dating, chronology and interpretation of the Late Neolithic-Early Bronze Age activity at Newgrange (Figure 4.13) is problematic and it is particularly difficult to disentangle the Grooved Ware activity from that associated with Beakers (Carlin, 2011: 60). Due to the brief nature of the final excavation and specialist reports it is difficult to establish an entirely cohesive understanding of the features uncovered. For example, the ceramics were dealt with typologically and the identifications are not entirely reliable and the association of pottery with particular features and other materials is not outlined adequately. Nevertheless, as noted by Mount (1994:

438-439) it is evident that various phases or episodes of activity took place. It is also difficult to understand the finer nuances of patterning across the site as the differences between features are absent from the final faunal report which predominately discussed the remains by excavation unit and/or the site as a whole, as it was interpreted under the understanding that it represented the remains of domestic activity. Nevertheless a number of conclusions may be drawn from the available data and radiocarbon dates. Recent Baysian analysis of dates associated with the construction of Newgrange 1 suggest that it was probably built c. 3100-3000 cal. BC (Lynch, et al., 2014: 46-50, 67-68). As for the activity outside of the tomb, relative dating may be proposed for each excavation unit.

The Central excavation unit (Figure 4.18) is the most chronologically problematic as the upper “Level A” included the old ground surface, an area covered by the “yellow bank”, the granite/quartz layer and the earthy/stony layer. In addition, the stratigraphic relationships between “Level B” subsurface features appear both complex and unclear based on the published reports. Furthermore, Roman material dating from the late first to the late fourth century A.D. was deposited in the central area (Carson and O'Kelly, 1977; Eogan and Grogan, 1991: 118) and two horse teeth, originally believed to be Chalcolithic in date, were recently dated to the Iron Age (Bendrey, et al., 2013). This also further problematizes the phasing of the features and parts of the site from which horse remains were recovered as they may be of similar (or later) date. However, the majority were discovered in the central area, but arguably those recorded in the subsurface were largely restricted to single features and/or restricted deposits. The upper “Level A” (the old ground layer (OGL), granite/quartz layer and earthy/stony layer) included bones from an MNI of 5 horses, while “subsurface” finds, representing an MNI of 3 animals, which were all associated with the L-shaped trench. These were recovered from a concentration (within cutting 10) and a pit (near the innerside of the trench). In this context is notable that Mount (1994: 438) highlighted the uncertainty of the stratigraphic relationship between the L-shaped trench and the adjacent hearths 3, 4, and 5. However, it should be noted that the pit could have been intrusive and it is also possible that the “concentration” actually represents the remains of a second (potentially intrusive) unidentified pit as Sweetman (1985: 215) discovered instances where O’Kelly failed to recognize the presence of sub-surface features in the eastern part of the site. Although it appears a significant portion of the activity in the central area appears to be of Late Neolithic-Chalcolithic date, there was later Iron Age activity of currently unknown scale and earlier Neolithic activity cannot be ruled out either.

The eastern excavation area (Figure 4.18), which includes the eastern timber ring, saw successive phases of activity. The timber ring (Figure 4.20) was only associated with Grooved Ware indicating that it was of Late Neolithic construction, but many of the other features in the area were associated with both Grooved Ware and Beaker pottery and based on available information this was the only area of the site to feature a pit which contained only Beaker ceramics. In addition, apart from the stone circle, which appears to post-date the Chalcolithic activity, this is the only part of the site with conclusive evidence for EBA activity which included a bronze axehead and Food Vessel Vase sherds in pottery concentration 5.

The western area (Figure 4.19) referred to as the "area under the yellow bank" appears to date exclusively to the Late Neolithic, but the chronology of the "far western area" is thrown into confusion by the presence of 11 horse bones from a single animal. Unfortunately the faunal report does not indicate precisely where these were discovered, and while it is feasible, if not probable, that these were discovered among concentration of animal bones found within the quartz/granite layer, no conclusive information has been obtainable. As such, although it is extremely probable that the activity in the "far western area", the majority of it being located "under the yellow bank", dates almost exclusively to the Late Neolithic, the horse bones raise a degree of uncertainty. The western timber circle (Figure 4.21) was associated with Beaker pottery, sherds of which was recovered from a number of the post-holes. It has been assumed that this indicates that the structure was of Chalcolithic construction, but as will be argued below, it is feasible that these were deposited in the context of secondary re-cutting of the post-holes and the western circle was in fact contemporary with the eastern circle. In terms of analysing the Late Neolithic activity on the site, the timber circles and the "area under the yellow bank", where horse bones were absent, may be considered "closed contexts" largely undisturbed by later activity and the "far western area" may be discussed with relative confidence in similar terms (although the amalgamation of information from the OGL and granite/quartz layer makes this difficult), but the material from the central area must be approached with an extra degree of caution.



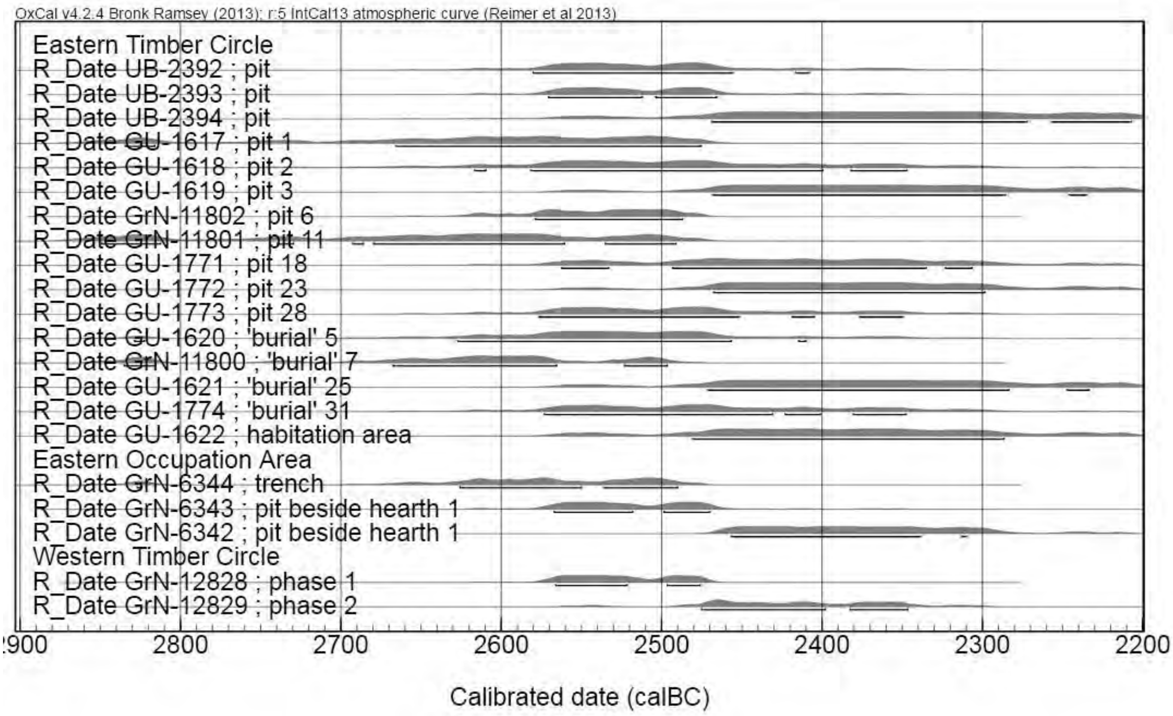


Figure 4.14: Multi-plots of the Newgrange radiocarbon dates. Top: Multi-plot of the radiocarbon dates from the occupation area in front of Newgrange. Bottom: Multi-plot of the Newgrange radiocarbon dates focusing on the 2700-2200 period (plots produced by author with oxcal version 4.2)

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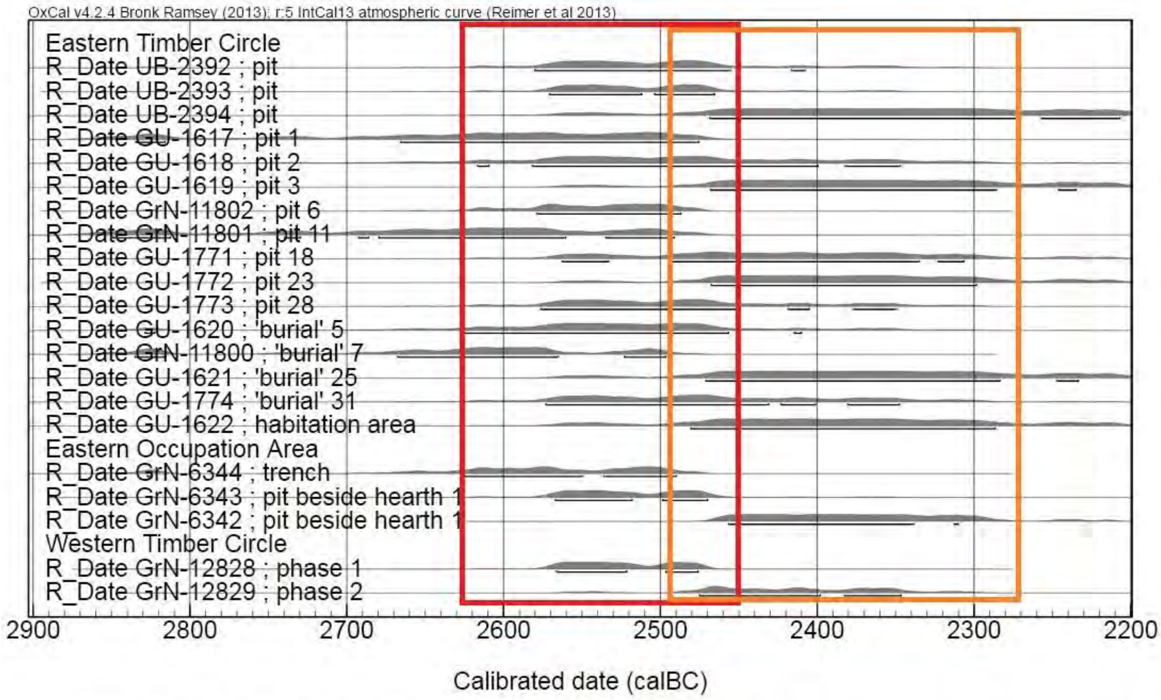


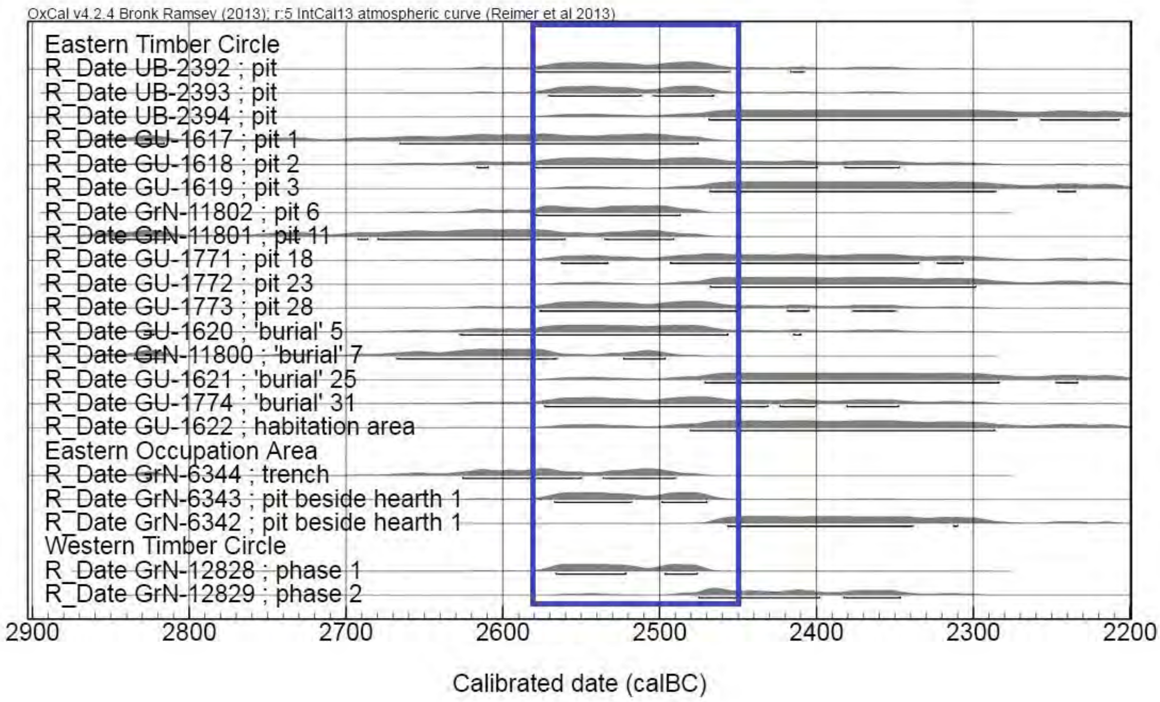


Figure 4.15: Multi-plots of the Newgrange radiocarbon dates with interpretation. Top: Multi-plot of the Newgrange radiocarbon dates focusing on the 2700-2200 period highlighting the two possibily overlapping phases of activity. Bottom: Multi-plot of the Newgrange radiocarbon dates focusing on the 2700-2200 period highlighting the peiod during which the majority of the activity may have occurred. (plots produced by author with oxcal version 4.2)

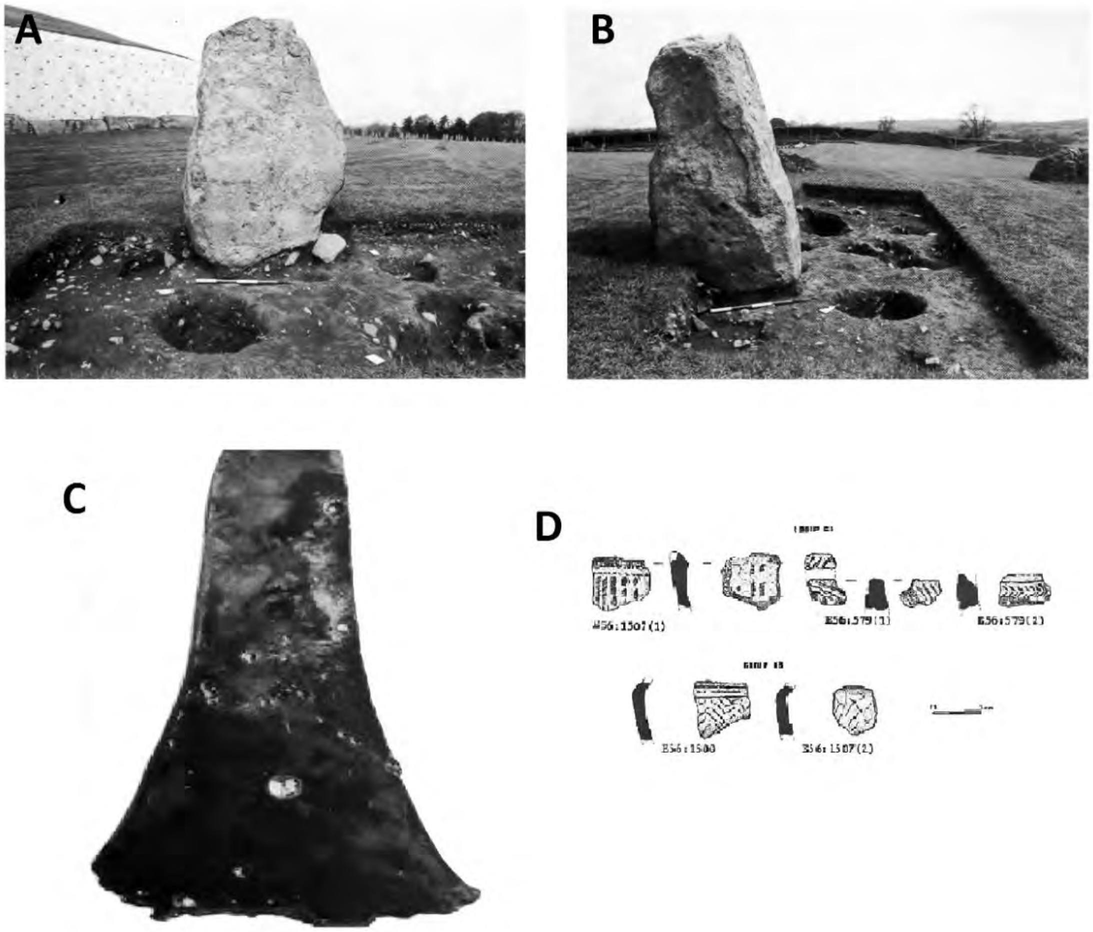


Figure 4.16: Evidence for EBA activity within the eastern excavation unit at Newgrange. (A-B) Standing stone GC-2 overlaying the timber circle (A) south face, (B) west face (Sweetman, 1985: Plate IV.); (C) EBA Bronze axe (O'Kelly and Shell, 1979: Plate 1.); (D) sherds of Vase Food Vessel pottery (O'Kelly, 1983: Fig. 51)

Unfortunately, it has not been possible to undertake Baysian analysis of radiocarbon dates available from Newgrange in the context of the current study. However, a rudimentary visual analysis of the overlap of highest probability for each of curves produced by the radiocarbon dates published by Grogan (1991) suggests that it is possible that there were two main phases of overlapping activity at the site (Figure 4.14), the first of Late Neolithic date associated with Grooved Ware c. 2628-2452 cal. BC, the second of Chalcolithic date associated with Beaker pottery c. 2494/2476-2284/2273 cal. BC (Figure 4.15). It also appears feasible that the majority of the activity outside Newgrange was focused during the period c. 2582/2568-2452 cal. BC (Figure 4.15) and was predominantly associated with Grooved Ware. Arguably, this conclusion may be supported by the forthcoming results of Bayesian modelling of the dates from all Irish timber circles, which as referred to by Lynch et al. (2014) indicates that they were mainly constructed c. 2700-2450 cal. BC. Additional support for this rudimentary chronological phasing is perhaps

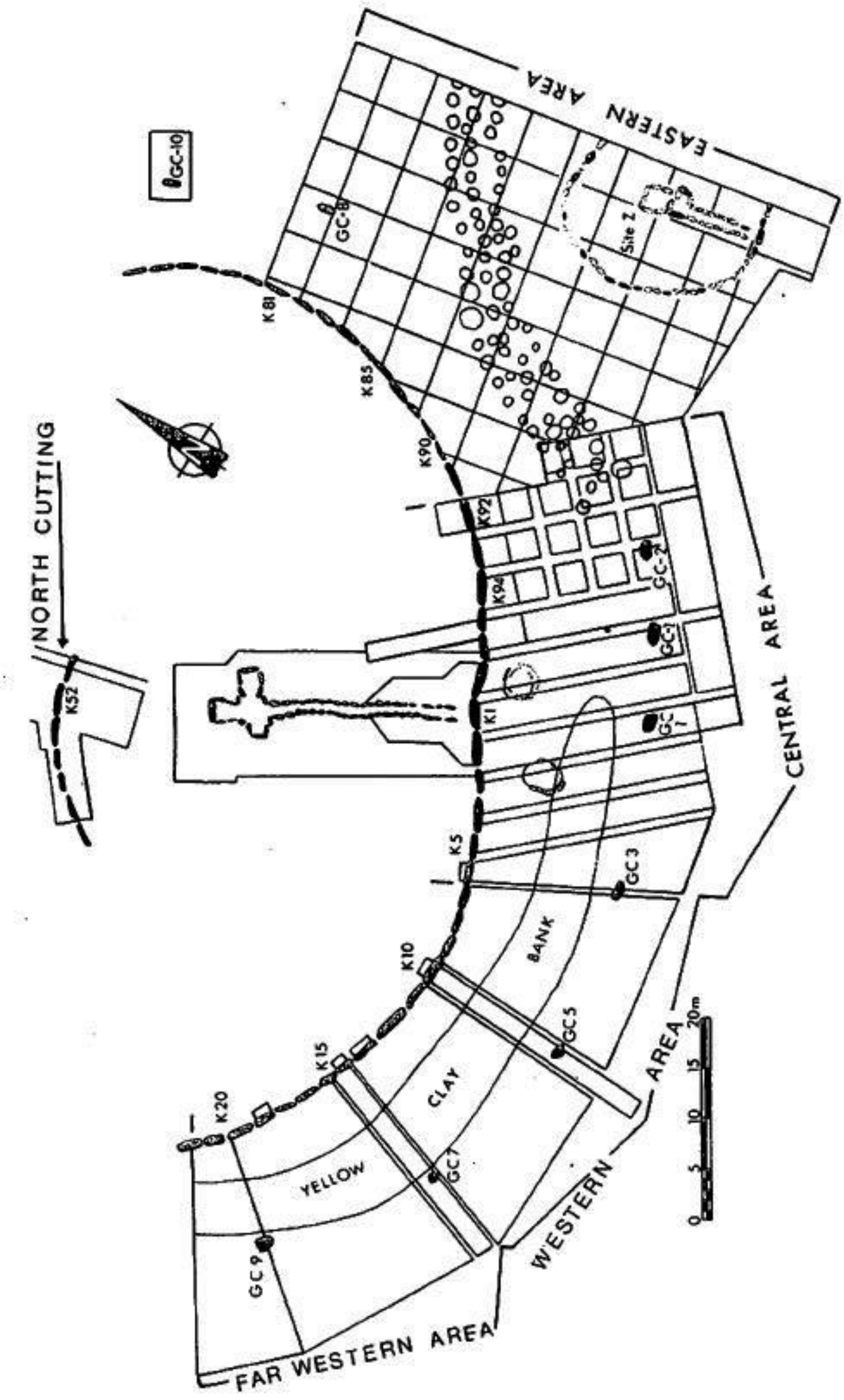


Figure 4.17: General plan of the O'Kelly excavations at Newgrange 1962-75 (O'Kelly, 1983: Fig. 2.)

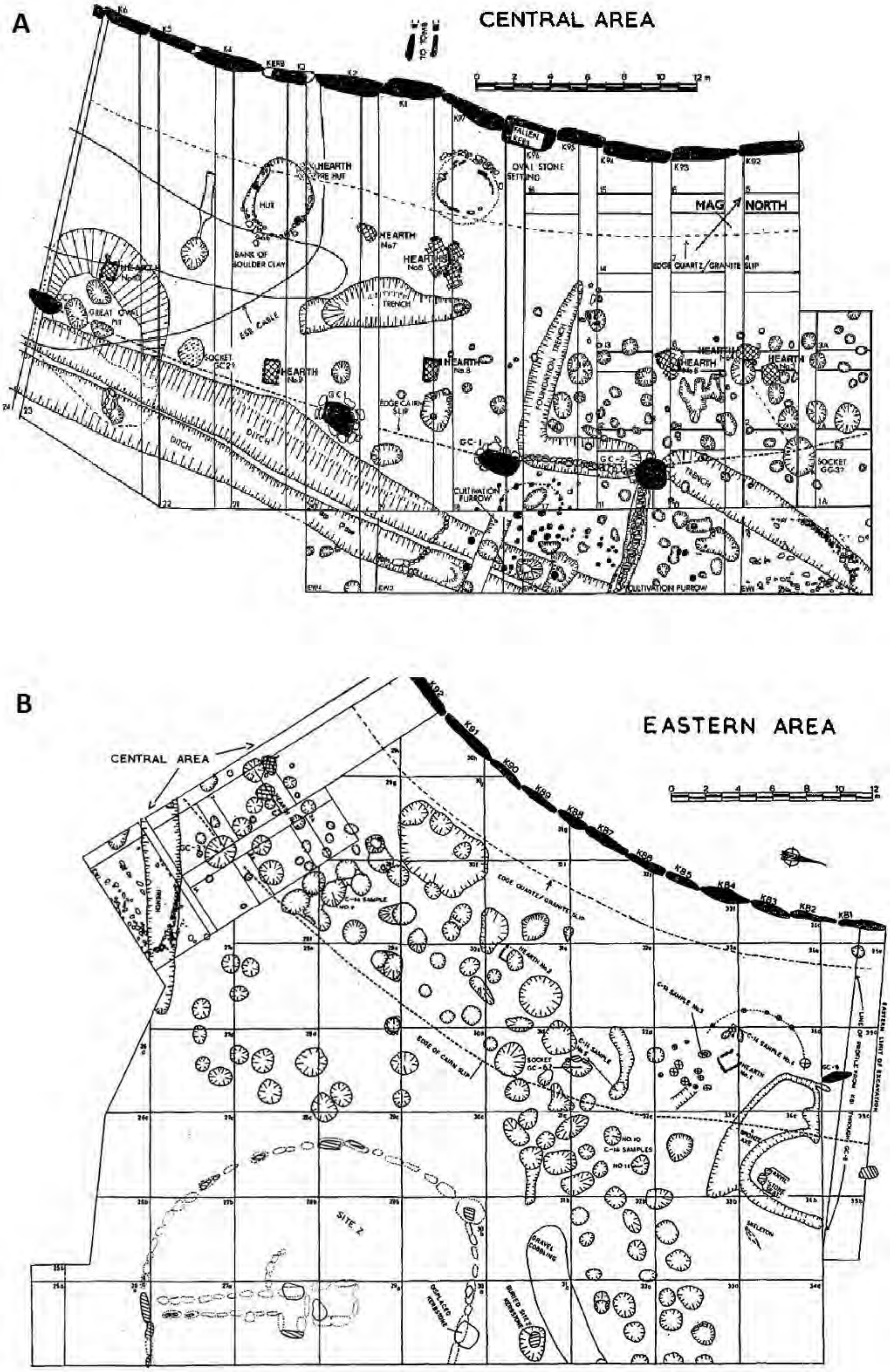


Figure 4.18: Plans of the central and eastern areas of Newgrange. (A) General plan Central area (O'Kelly, 1983: Fig. 8.); (B) General plan of Eastern area (O'Kelly, 1983: Fig. 4.)

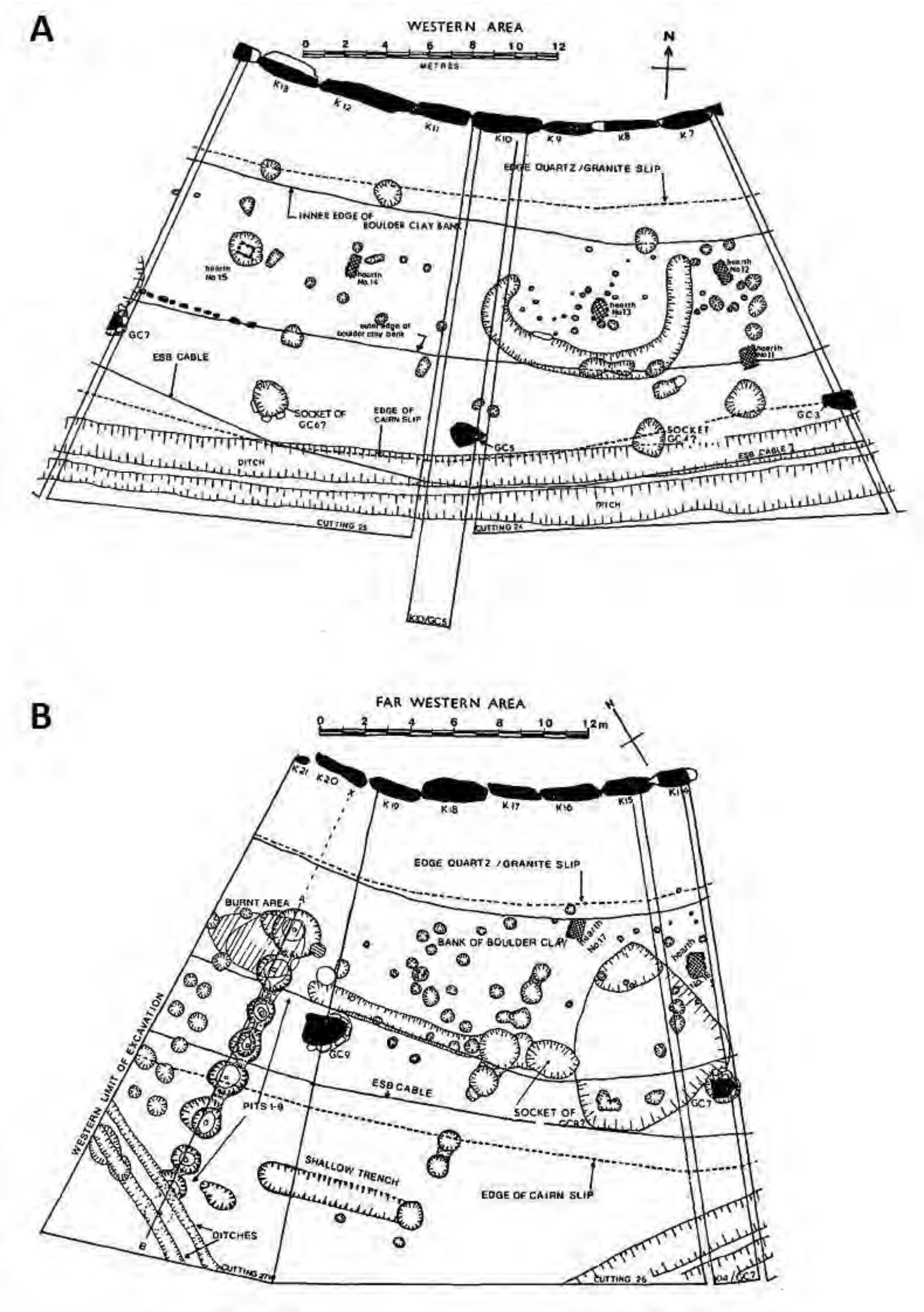


Figure 4.19: Plans of the western areas of Newgrange. (A) General plan of Western area (O'Kelly, 1983: Fig. 10.); (B) General plan of Far Western area (O'Kelly, 1983: Fig. 12.)

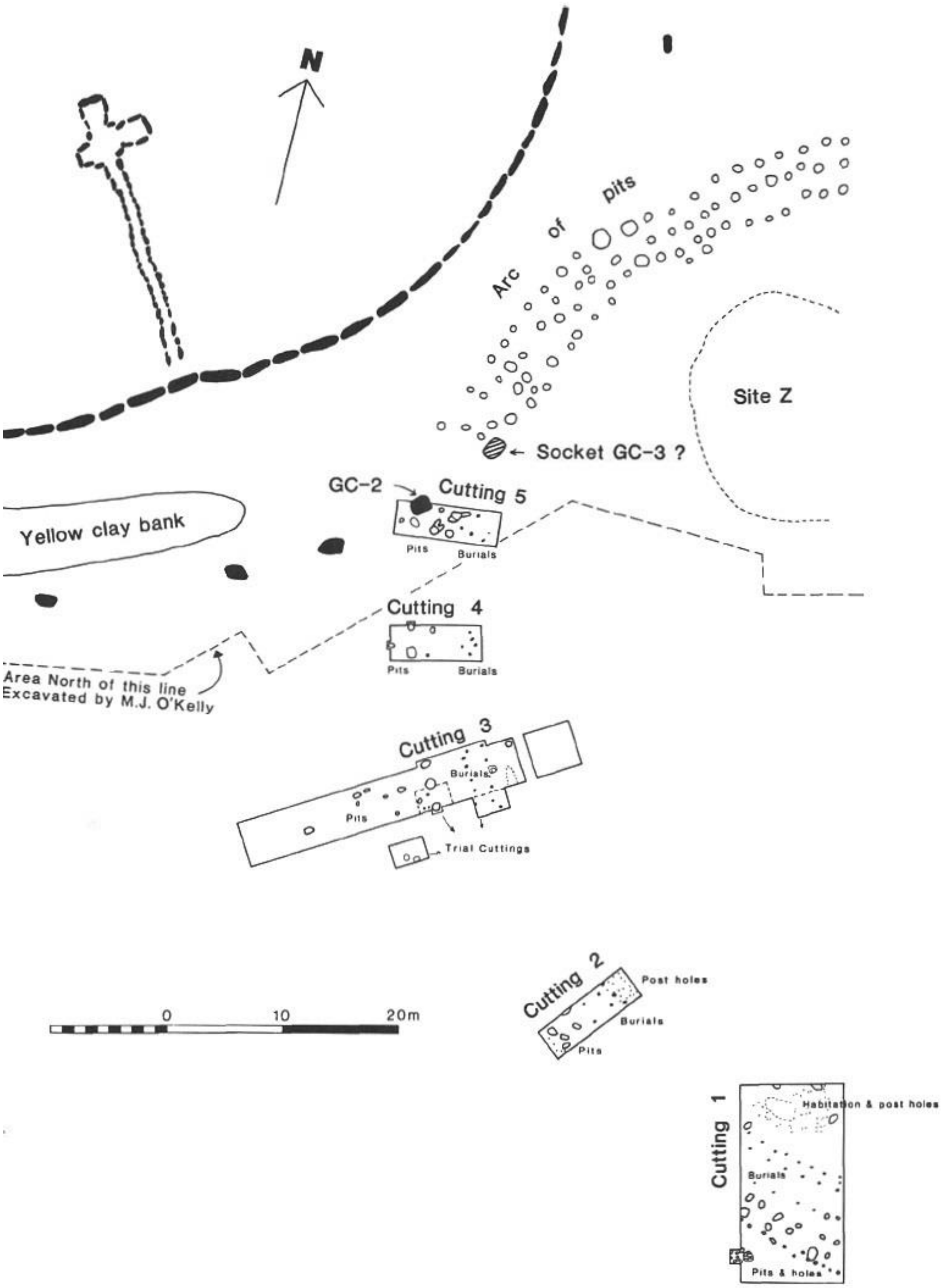


Figure 4.20: General plan of cuttings in Newgrange eastern timber circle (Sweetman, 1985: Fig. 2)

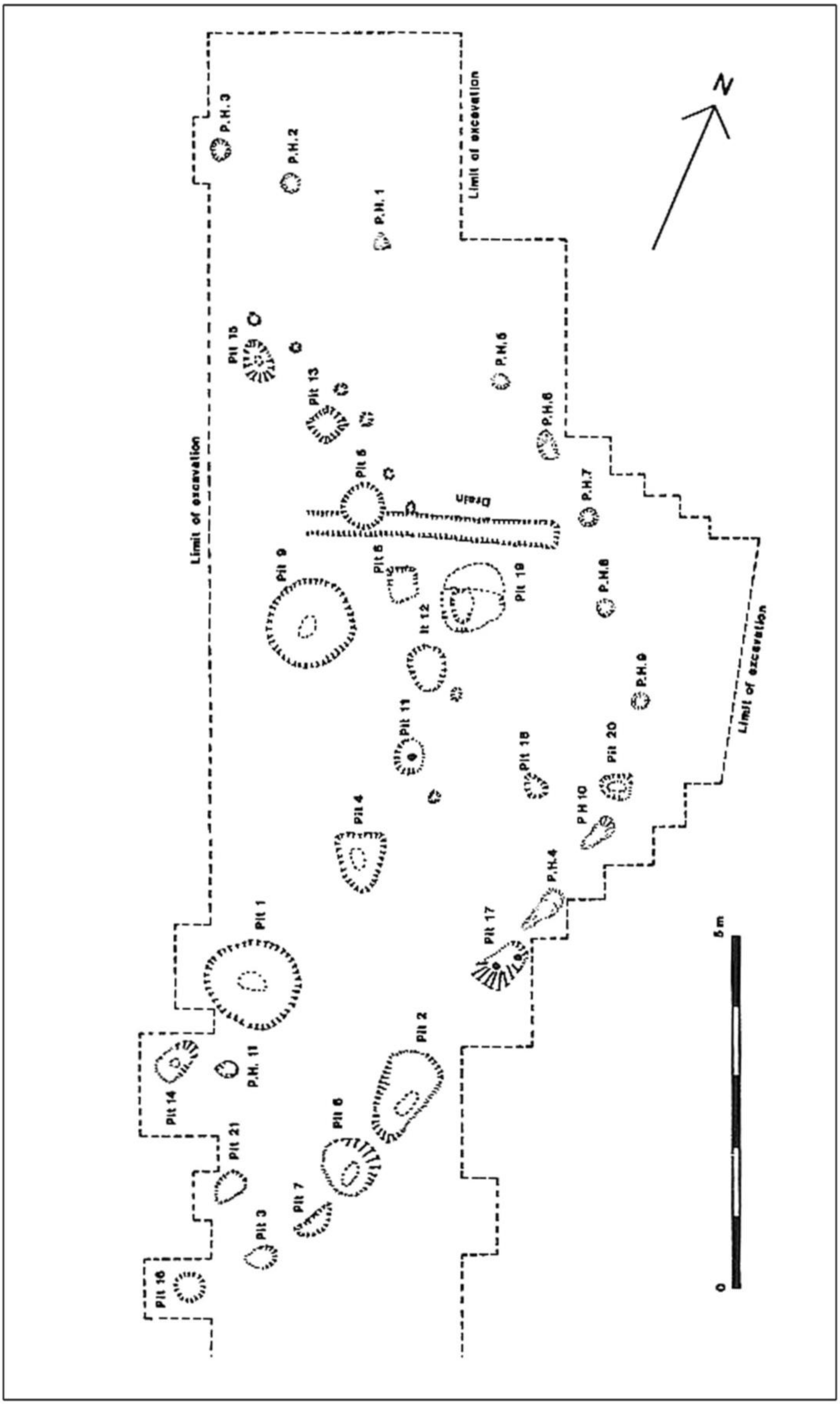


Figure 4.21: Plan of the Nerwgrange western timber circle (after Sweetman, 1987: Fig. 2.)

provided by the date of c. 2564-2298 cal. BC recently obtained for a tooth discovered in the subsoil under the quartz layer at the rear of Newgrange 1 along with a Chalcolithic flint core (*ibid*.: 39-40). This date also suggests that the quartz/granite layer which overlies a substantial portion of the Late Neolithic-Chalcolithic activity was deposited, whether intentional or otherwise, during or after the Chalcolithic (*ibid*.). The EBA Food Vessel Vase sherds found at Newgrange feature twisted cord decoration (Cleary, 1983: 108, Fig. 51), a technique which belongs to stage 3 of Brindley's (2007: 178-189) typological scheme, which suggests that these vessels, and presumably the activity with which they were associated, are likely to date to between c. 1920-1885 and c. 1870-1830 cal. BC (Bayliss and O'Sullivan, 2013: 71). The bronze axe belongs to the 'Killaha metalworking phase' which is currently assigned to c. 2000-1900 BC (Lanting and van der Plicht, 2001-2; Brindley, 2007: 372-373) suggesting a degree of contemporaneity with the ceramics. Stratigraphically one of the stones of the stone ring (GCS2) overlays part of the timber circle (Sweetman, 1985: 208-209) and may also post-date the Chalcolithic activity (Figure 4.16). Thus, it appears that Eriksen's (2008) suggestion that the stone ring was erected at the beginning of the Early Bronze Age, perhaps c. 2200-2000 BC (Figure 4.12) appears feasible, but a date of c. 2000-1850 BC, when the bronze axe and Vase pottery probably appeared on the site, may be more likely.

4.5.2 (2) Food preparation, consumption, and deposition features

4.5.2.1 Food Preparation Facilities

The O'Kelly (1983) excavations (Figure 4.17) uncovered evidence for 17 hearths at Newgrange and a number of them appear to have been situated outdoors. Hearths 1 and 2 were located in the eastern excavation unit, hearths 3-10 in the central unit and hearths 11-17 in the western unit. Hearth 1 in the northern part of the Eastern area was not connected with discernible structural features, but there may have been a screen located to the west. The hearth was associated with pottery concentration 5 and a "sizeable amount" of flint. To the east of the hearth was the reputed 'metalworking area' (O'Kelly and Shell, 1979; O'Kelly, 1983: 15-16; Carlin, 2011: 60).

Located in the central area (Figure 4.18), hearths 3 and 4, both of which did not have stone settings were located beside pits at the south-western end of the eastern timber circle. To the north of these hearths (Figure 4.18; within the eastern excavation unit, near kerbstones 89, 90 and 91) was a large shallow depression which contained a scatter of flint debitage, some animal bones and three shallow pits filled with dark soil flecked with charcoal. Just beyond the southern end of the depression was a scatter of flint artefacts, some of which were mixed through the extreme edge of the quartz layer. Within the area 'enclosed' by an L-shaped trench (opposite kerbstones 92-95) was the rectangular stone-set hearth 5 which contained ash, charcoal and animal bones and was associated with pottery concentration 4. To the east of the tomb entrance and south of an oval stone setting was hearth 6 which had a U-shaped stone setting, and produced evidence for three phases of construction and use. Further west a burnt area, interpreted as hearth 7, was probably the focus of pottery concentration 2. It was advanced that a broad shallow trench located immediately to the south of hearths 5 and 6 was explained as the remains of a windbreak, although direct evidence was absent. South of the trench was hearth 8, another rectangular stone-set example associated with a number of pits. Hearth 9, a rectangular stone-set example associated with virtually no occupation debris, was situated to the west of the orthostat opposite the tomb entrance (GC1). Hearth 10, another rectangular stone setting, was situated on the 'great pit' near the western end of the central area and associated with a number pits but very little occupation debris (O'Kelly, 1983: 21, 23-24, 26).

Hearths 11-15 and 17 were located in the area "under the yellow bank" (Figure 4.19) along with a series of pits and some postholes. These hearths were also associated with pottery, flint artefacts and animal bones. Hearths 11 and 12, both of which had rectangular stone settings, were located at the eastern edge of the area, and a number of pits and postholes at the centre of an area of occupation debris were located between them. To the west was hearth 13 which had a horseshoe-shaped stone-setting which, along with a number of postholes, was surrounded by a shallow C-shaped trench which could have held a windbreak. In contrast, hearths 14 and 15, situated further to the west, appear to have been open-air, as was hearth 16 which was located beyond the limit of the "yellow bank" and hearth 17 located just under the northern edge of the "yellow bank" in the most westerly excavated part of the site. Hearth 16 was associated with postholes, pits and a large shallow hollow which contained dark soil, animal bones, flint and pottery (O'Kelly, 1983: 29, 35).

4.5.2.1.1 Additional Activities

According to Cleary (1983: 62), prepared clay that had been tempered but not moulded into shape and which was accidentally fired, was found in a number of locations indicating that pottery was made on-site. The largest quantity was discovered in the area outside the great stone circle in the East-West extension. It was also found in association with pottery concentrations 1-4 and under the "yellow bank" (in cutting 26). Analysis of the 11,000+ flints which were recovered (Lehane, 1983: 118-121) indicated that flint implements were produced and used on the site, including initial core preparation and selection. The distribution of debitage and finished implements showed that although there were a number of concentrations in each excavation unit (including notable quantities associated with pottery concentrations 1, 2, 3 and 5), they occurred in relatively the same areas and there were no specialised knapping or utilisation centres. This would appear to suggest that similar activities, including knapping, took place in different parts of the site and Carlin (2011: 60) has commented on the fact that generally the lithic assemblage closely resembles the Grooved Ware associated assemblage from Knowth. In the eastern excavation unit an alleged "metalworking area" and "metalworking equipment" were identified close to hearth 1 (O'Kelly and Shell, 1979; O'Kelly, 1983: 15-16; Carlin, 2011: 60). The latter

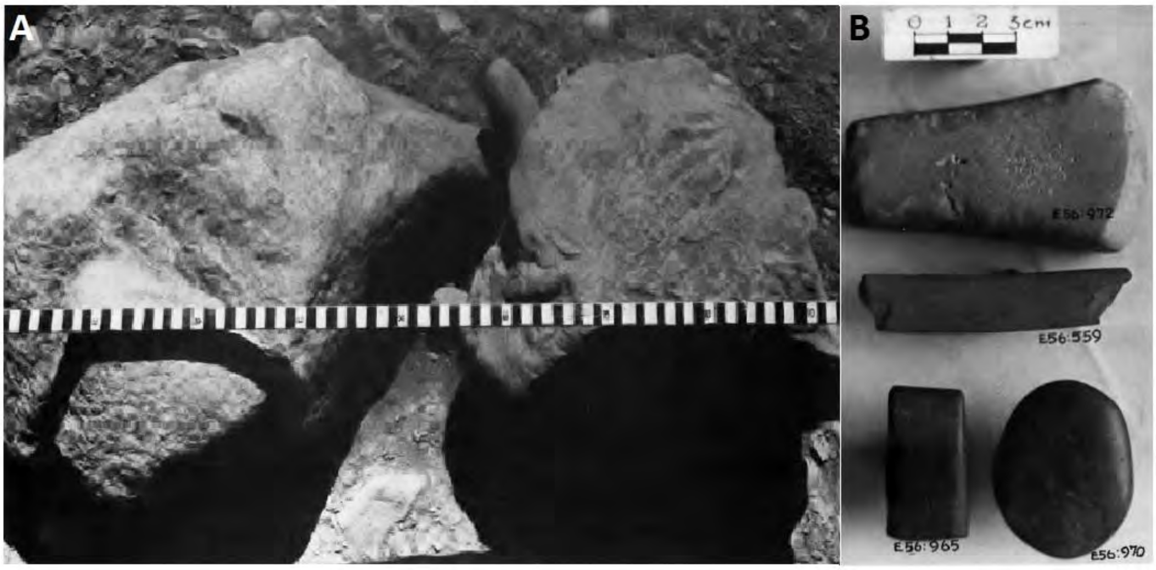


Figure 4.22: The "metalworking" area and tools from the Eastern excavation unit at Newgrange. (A) Boulders possibly used as 'seat' (left) and 'anvil' (right), Newgrange (after O'Kelly and Shell, 1979: Plates 2-3); (B) Stone implements interpreted as a metalworker's toolkit (O'Kelly and Shell, 1979: Plate 3)

included half of a perforated stone hammer, a small quartzite hammer/hone, a chisel shaped stone object and a burnishing/polishing stone (Figure 4.22). The former, situated to the east of the hearth consisted of a pair of closely-set boulders situated within an arrangement of narrow shallow trenches and the bronze Killaha-type axe was found between the hearth and this area (Figure 4.22). The upper surface of the larger rock was almost polished (interpreted as a seat) and the upper surface of the smaller one was deeply pitted and abraded (interpreted as an anvil). However, as noted by Carlin (2011: 60) the chronological integrity of this putative complex of metalworking activity is questionable.

4.5.2.2 Pottery

Over 3,600 ceramic sherds representing c. 210 vessels were recovered during the excavations at Newgrange. According to Cleary (1983: 60) each pottery concentration contained several ceramic types (Figure 4.23, Figure 4.24). These included such styles as Grooved Ware, Late-Neolithic-influenced domestic wares, classical Beaker, "Beaker influenced ware" and Food vessel. The majority of the pottery was discovered mixed within 5 concentrations, four of which were located

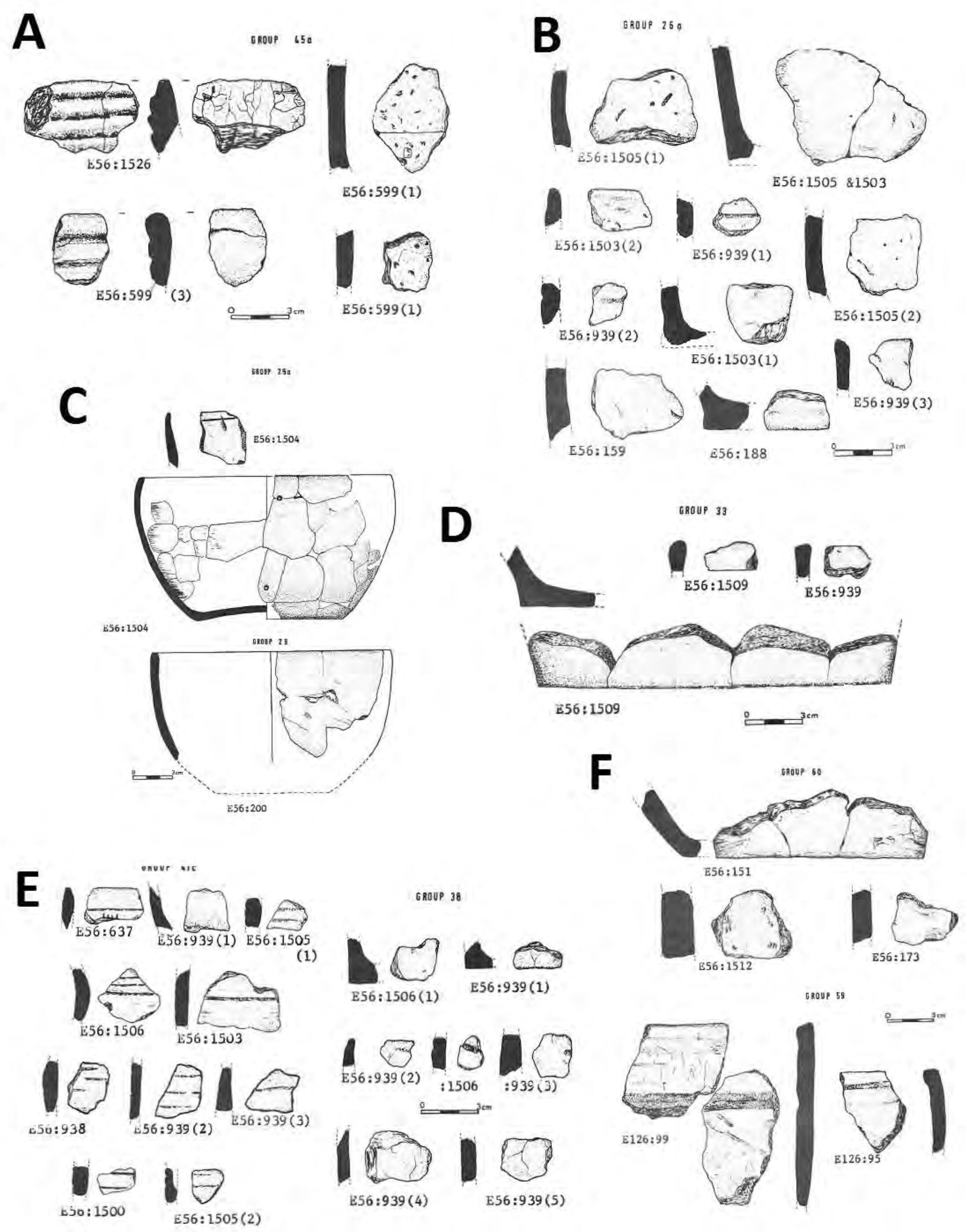


Figure 4.23: Selection of Grooved Ware and related pottery from Newgrange (adapted from O'Kelly, 1983: Figs. 31, 33, 35, 38, 43, 51). (A) Group 45a, Grooved ware; (B) Group 26a, Rusticated ware/Grooved ware; (C) Groups 25a, 29, Undecorated bowls/Grooved ware; (D) Group 33, Flat-based bucket shaped ware/Grooved ware; (E) Groups 38, 41c, 'Beaker-influenced ware'; (F) Groups 60, Thick coarse domestic pottery

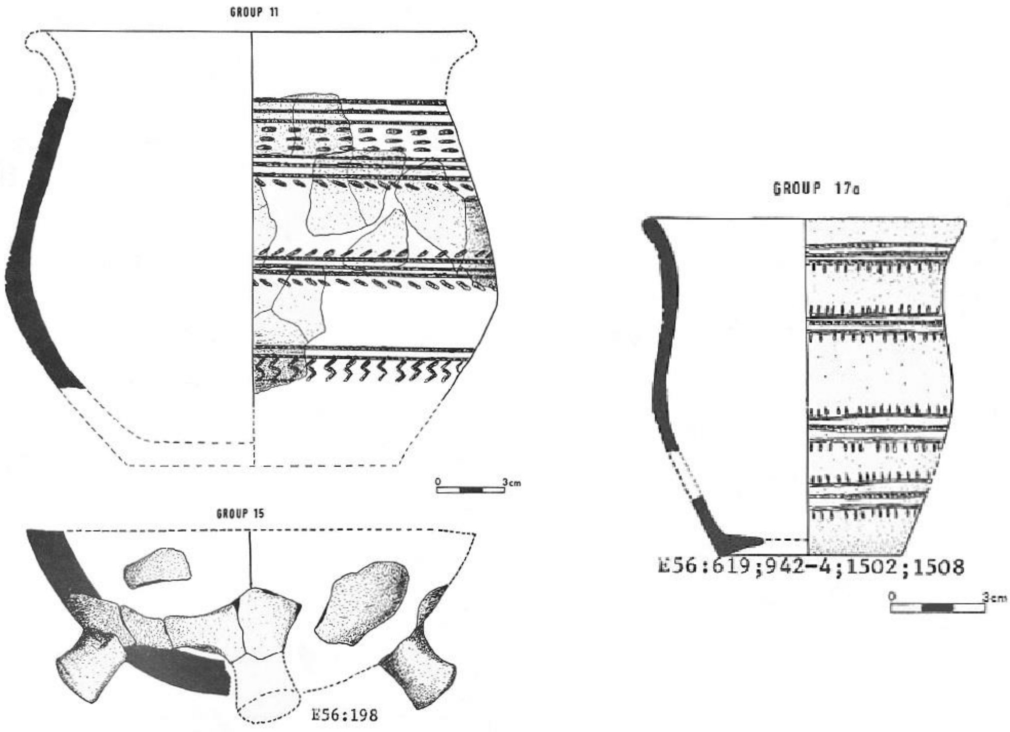


Figure 4.24: Selection of Beaker pottery from Newgrange (adapted from O'Kelly, 1983: Figs. 25, 28). Group 11, European/Maritime; Groups 15, 17a, Wessex/Middle Rhine

in a c. 30m area near the tomb entrance (Mount, 1994: 435), the fifth being located in the eastern area. Minor concentrations were also found in the western part of the site, but here the majority of the ceramics recovered were typologically Late Neolithic and Beaker pottery. Beaker pottery was associated with the Western Timber Circle and Grooved Ware with the Eastern Timber Circle. Additionally, a small number of isolated pits contained pottery and the area within the Eastern Timber Circle where the destroyed passage tomb (Site Z) was located also contained features associated with Grooved Ware and Beaker pottery. As stated by Carlin (2011: 59) the fabric-driven and typological methods of classification employed in the analysis of the ceramics and the treatment of the material as a single assemblage limits the possibility of identifying where each pottery type was found. Moreover, in addition to the Grooved Ware identified by Cleary (1983: 100), re-analysis by Roche (1995) demonstrated that the pottery described as 'undecorated Beaker-associated bowls' and 'rusticated Beaker ware' (Cleary, 1983) actually represent Grooved Ware (Carlin, 2011: 59). In fact, it seems feasible that there was an even greater overestimation of the amount of Beaker Pottery present and majority of the pottery is of Late Neolithic date and at least some of Cleary's (1983) "Beaker influenced ware" could have Grooved Ware affinities.

4.5.2.3 *Deposition Features*

The most substantial deposition features identified were 'pottery concentrations' 1-5 (Table 4.3). Concentration 1, 2 and 4 (O'Kelly, 1982: 76-77; Cleary, 1983: 61; O'Kelly, 1983: 24, 26; Roche, 1995) located to the west and east of the tomb entrance, appear to represent midden features. Both concentrations 2 and 5 (O'Kelly, 1983: 15, 24; Cleary, 1983: 61; Roche, 1995) located almost directly opposite the tomb entrance and the northern part of the eastern excavation unit respectively, may be described as "pottery dumps" as they were not associated with faunal remains. The minor pottery concentration in the far Western area (Table 4.3), associated with

Pottery Concentration 1	**West of tomb entrance**		O'Kelly, 1982: 76-77; Cleary, 1983: 61; O'Kelly, 1983: 26; see also Roche, 1995
Mixed through and beneath the earth/stone layer; Largely concentrated within hollow	Grooved Ware Classical Beaker Beaker bowls (Grooved Ware?) "Beaker influenced ware"	Flint Animal bones	Possible midden
Pottery Concentration 2	**Almost directly opposite tomb entrance**		O'Kelly, 1983: 24; Cleary, 1983: 61; see also Roche, 1995
Between hearths 6 and 7	Grooved Ware Classical Beaker "Beaker influenced ware"	Flint artefacts Flint debitage Animal bones	Possible midden
Pottery Concentration 3	**East of tomb entrance**		Cleary, 1983: 61, 74; O'Kelly, 1983: 23; see also Roche, 1995
Within a foundation trench and general scatter	Grooved Ware Classical Beaker Polypod bowls "Beaker influenced ware"		"pottery dump"(?)
Pottery Concentration 4	**East of tomb entrance**		Cleary, 1983: 61; O'Kelly, 1983: 24; see also Roche, 1995
Centred on hearth 5	Grooved Ware Classical Beaker "Beaker influenced ware"	Flint artefacts Flint debitage Animal bones Dark soil	Possible midden pits
Pottery Concentration 5	**Northern part of eastern excavation unit**		Cleary, 1983: 61; O'Kelly, 1983: 15; see also Roche, 1995
Close to hearth 1	Grooved Ware Classical Beaker "Beaker influenced ware" Food Vessel	Flint	"pottery dump"(?)
Minor Pottery Concentration	**Far Western area (cutting 27W)**		Cleary, 1983: 62; O'Kelly, 1983: 35; see also Roche, 1995
Associated with hearth 16 Within oval hollow	Grooved Ware "Late-Neolithic-influenced domestic wares"	Animal bones Dark soil	Possible midden

Table 4.3: Distribution of deposition features at Newgrange (after Cleary, 1983; O'Kelly, 1983)

dark soil and animal bones (Cleary, 1983: 62; O'Kelly, 1983: 35; Roche, 1995) could represent another midden. Further midden features may have been associated with hearths 11-15 and 17 under the "yellow bank". These were all associated with Grooved Ware and "Late-Neolithic-influenced domestic wares" and although some Beaker pottery also occurred under the "yellow bank", but none of it was directly associated with the coarse pottery or hearths (Cleary, 1983: 61-62; O'Kelly, 1983: 29, 35; Roche, 1995). Pottery sherds, and in some instances charcoal or 'midden material', were also recovered from a small number of 'isolated' pits in the central and eastern excavation units, and both the western and eastern timber circles (see 4.5.3.1).

4.5.2.4 Faunal Remains

As outlined by Mount (1994: 436), who previously re-interpreted this as evidence of feasting activity, the total quantity of bone recovered from O'Kelly's excavations was in the region of 24,000-30,500 fragments, 12,191 of which were identified by van Wijngaarden·Bakker (1974, 1986). The total number of unidentifiable bones was not quantified but consisted of diaphysis, skull, and rib fragments and was estimated at 50-60% of the total remains (van Wijngaarden·Bakker, 1986: 23-24). Sweetman's excavations (1985, 1987) produced a further 877 bone fragments, of which 88 were identifiable. Of the identifiable faunal remains from Newgrange cattle represent 31.5% and pig 61.3% (Mount, 1994: 437) and the breakdown of the assemblages of animal bone from each area of the site have been summarized in Table 4.4.

4.5.2.4.1 Cattle

Cattle (MNI = 106) were relatively evenly distributed across the site (Table 4.4) with 20+ individuals being recorded in most of the divisions, apart from the sub-surface features in the central excavation unit where the MNI was three animals (van Wijngaarden-Bakker, 1986). The proportion of males to females was estimated to be approximately 1:1 (*ibid.*: 46-47), which suggests these animals do not represent a "local" population. About 10% of the cattle were killed at less than 1½ years of age, 5% between 1½-2½ years of age, 75% were slaughtered between 3 and 4 years of age, and 5% were older than 4 years when killed (*ibid*.: 45-46, 49-51). The juvenile cattle mortality rate of 10% falls well below the expected 20-30%, a situation which is further highlighted by the almost complete absence of neonatal bones. The absence of bones from neonatal and juvenile cattle could be accounted for by differential destruction, taphonomic processes, the methods of archaeological retrieval, or a combination thereof. However this would still not account for the lack of cattle between 2½ and 3 years of age (van Wijngaarden-Bakker, 1986: 51; Mount, 1994: 441), which further suggests that the cattle represent "prime beef" animals bred for commensal consumption and sourced from a number of herds.

The Newgrange cattle attained a shoulder height of between 120cm and 135cm at maturity and their live weight was estimated at 300-400kg and carcass weight at c. 135-220kg respectively (*ibid*.: 44). This is comparable with the Early Neolithic animals from Windmill Hill (Wiltshire) whose shoulder heights had a range of 120-139cm. In southern England the size of cattle

Excavation Unit	Number of bones	Assemblage Animal MNI	References
Eastern Area OGL	1862 cattle 585 pig 81 sheep/goat 54 dog 51 horse 10 deer (11 deer antler) 7 mountain hare 3 fox 1 wild cat 1(?) wild boar 1 duck	25 cattle (42%), 18 pig (30%) 5 Sheep/goat (8%) 7 dog (12%) 3 horse (5%) 2 deer (3%) 2 mountain hare 1 fox 1 wild cat 1 brown bear 1(?) wild boar 1 duck	van Wijngaarden-Bakker 1986
Eastern Area Pits	214 cattle 88 pig 30 dog 2 sheep/goat 2 deer (6 deer antler) 1 mountain hare 1 brown bear		van Wijngaarden-Bakker 1986
Eastern Circle	552 fragments	cattle, pig, deer, dog, sheep/goat	Sweetman 1985
Central Area Level A	2186 cattle 1196 pig 203 sheep/goat 141 dog 65 horse 52 deer (1 deer antler) 14 mountain hare 6 goshawk 1 water-rail	32 cattle (37%) 26 pig (30%) 10 sheep/goat (12%) 10 dog (12%) 5 horse (6%) 3 deer (4%) 3 mountain hare 1 goshawk 1 water-rail	van Wijngaarden-Bakker 1974, 1986
Central Area Level B Subsurface Features	234 cattle 84 pig 25 sheep/goat 1 dog 24 horse bones 3 deer (1 deer antler)	3 cattle (20%) 2 pig (13%) 4 sheep/goat (27%) 1 dog (7%) 3 horse (20%) 2 deer (13%)	van Wijngaarden-Bakker 1974, 1986
Western Area OGL & G/Q Layer	1375 cattle 1198 pig 41 sheep/goat 38 dog 11 horse 5 deer 2(?) mountain hare 4 goshawk	21 cattle (24%) 56 pig (65%) 4 sheep/goats (5%) 3 dogs (4%) 1 horse (1%) 1 deer (1%) 1(?) mountain hare 1 goshawk	van Wijngaarden-Bakker 1986
Western Area Under Yellow Bank	1196 cattle 1057 pig 5 sheep/goat 17 dog 11 deer (1 deer antler) 2 mountain hare	25 cattle (19%) 104 pig (79%) 1 sheep/goat (1%) 2 dog (2%) 2 deer (2%) 1 mountain hare	van Wijngaarden-Bakker 1986
Western Circle	38 pig 3+ cattle 1(?) sheep/goat	MNI N/A almost exclusively pig, cattle fragments in one pit	Sweetman 1987 McCormick 1987

Table 4.4: The distribution of faunal remains and MNI animal estimates for each excavation unit (after van Wijngaarden-Bakker 1974, 1986; Sweetman 1985, 1987; McCormick 1987)

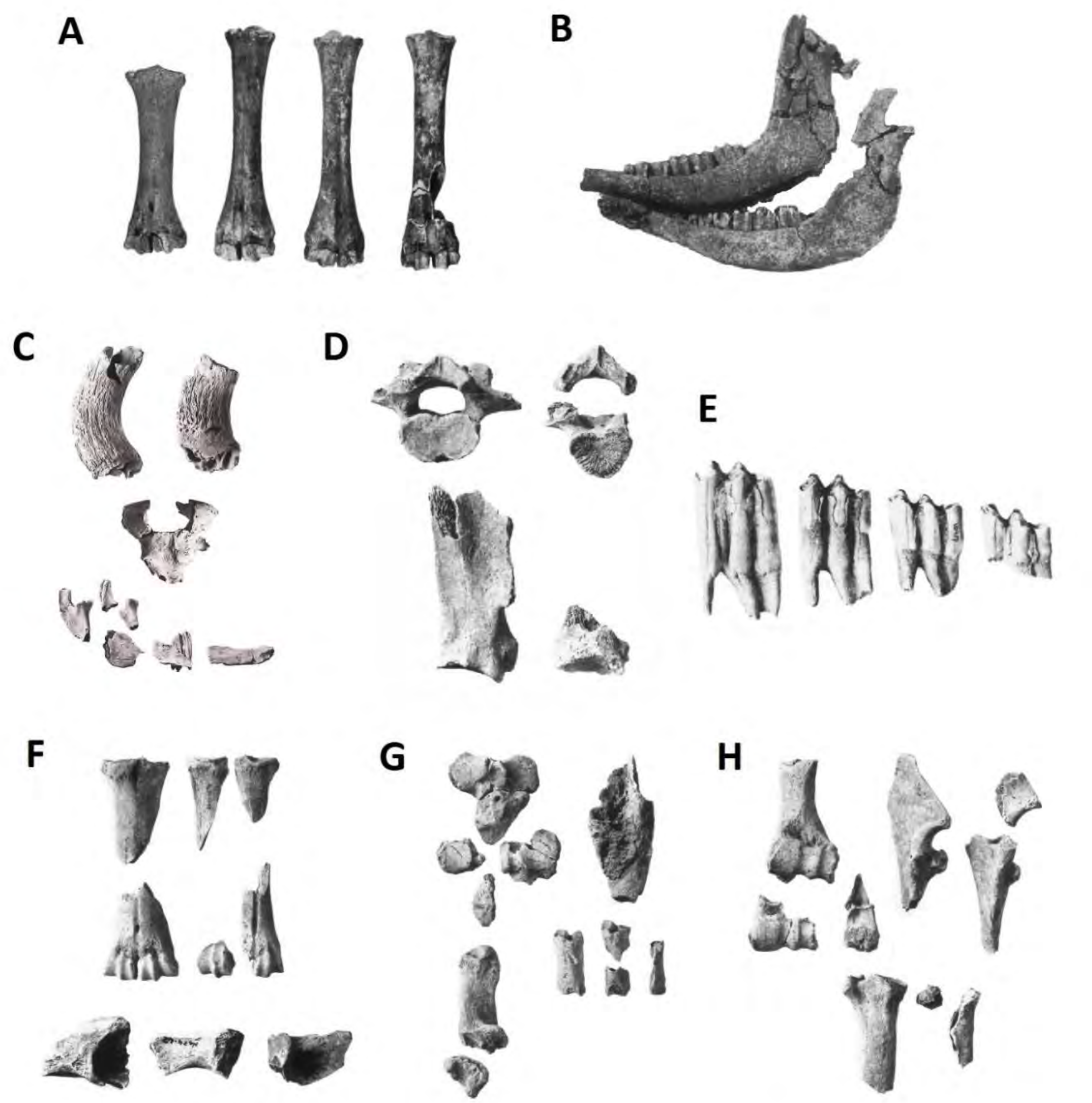


Figure 4.25: Selection of cattle bones from Newgrange (not to scale). (A) Cattle Metacarpal and metatarsals (van Wijngaarden-Bakker, 1974: Plate LXVI.); (B) Complete mandibula of cattle (van Wijngaarden-Bakker, 1986: Plate II.); (C) Horn cores of cattle, basilar part of occipital bone of cattle, breakage pattern of mandibula of cattle (van Wijngaarden-Bakker, 1986: Plate I.); (D) Breakage pattern of cattle vertebrae and scapula; (E) Third molars of cattle in different stages of wear (van Wijngaarden-Bakker, 1986: Plate II.); (F) Breakage patterns of the proximal metacarpal, distal metacarpal, and the acetabular region of the pelvis of cattle (van Wijngaarden-Bakker, 1986: Plate V.); (G) Breakage patterns of the tibiae, calcaneum, and first phalanx of cattle (van Wijngaarden-Bakker, 1986: Plate VI.); (H) Breakage patterns of the distal humerus, the proximal radius, and the ulna of cattle (van Wijngaarden-Bakker, 1986: Plate IV.)

diminished from the 4th to the 2nd millennium BC. For example, at Boscombe Down (Wiltshire) the cattle showed a decrease in size from the earlier to the Late Neolithic. However, this decrease does not appear to have been uniform as, for example, a number of large specimens were recovered from the Early Bronze Age barrows at Milton Lilbourne (Wiltshire). This would appear to indicate that the Newgrange cattle were unusually large animals (van Wijngaarden-Bakker, 1974: 335-336; Serjeantson, 2011: 18-19), and may have been consciously bred to attain large stature with feasting in mind. Very little butchering evidence survived on the cattle bones. In contrast to cattle leg bones, foot bones were not split and some femur fragments were also intact indicating that they were not split for marrow extraction. There was also no evidence that either skulls or vertebral columns were split longitudinally (Figure 4.25; van Wijngaarden-Bakker 1986, 36, 40-41). The low levels of marrow extraction identified provides additional support for the feasting hypothesis.

4.5.2.4.2 Pig

Of the 206 (MNI) pigs, the vast majority (c. 78%) were recorded in the western area with 56 (27.2%) in the “far western” area and 104 (50.5%) under the “yellow bank”, while smaller numbers were recorded across the rest of the site (Table 4.4) (van Wijngaarden-Bakker, 1986). Although the evidence may appear to point to a significantly higher proportion of males than females, van Wijngaarden-Bakker (*ibid*.: 72-73) concluded that they were present in approximately equal numbers, which suggests that like the cattle the pigs do not represent a “local” population. Based on epiphyseal fusion data 70% of the Newgrange pigs were slaughtered between 0-2½ years, and 30% betwwn 3-4 years. A more detailed breakdown of the data suggests 4% were slaughtered between 0 and 1 year of age, 9% were between 1 and 2 years, the majority 57% were killed around 2 and 2½ years of age, 17% between 2½ and 3½ years, and 13% after 3½ years (*ibid*.: 74). Again the under-representation of juveniles could be accounted for by differential destruction, taphonomic processes, the methods of archaeological retrieval, or a combination thereof. Despite admitting the limited value of the age estimates provided, van Wijngaarden-Bakker (*ibid*.: 74-75) was able to propose some conclusions. As the majority of the pigs were slaughtered at about 2-2½ years it suggests they reached physical maturity and may thus have been bred specifically for meat production. Furthermore, the pigs slaughtered when 3-4 years of age may have had carcasses which consisted of 50% fat, suggesting that they would have been particularly suitable for consumption during feasts.

Van Wijngaarden-Bakker (*ibid*.: 56, 75) used the wear stages of third molars coupled with age estimates to give an insight into the seasonal slaughtering activity. She concluded that 70% of the pigs were slaughtered between October and April and 30% between April and September. As she was interpreting the site in terms of a domestic economy her reading of the seasonal pattern appears to have been distorted, as there hints within the data, such as the majority of animals being c. 2½ years of age when killed, that an autumn/early winter slaughtering season was typical. Notwithstanding, as stated by Mount (1994: 442) there was clearly some activity at the site during the summer months, but the lack of provenance for animals associated with different

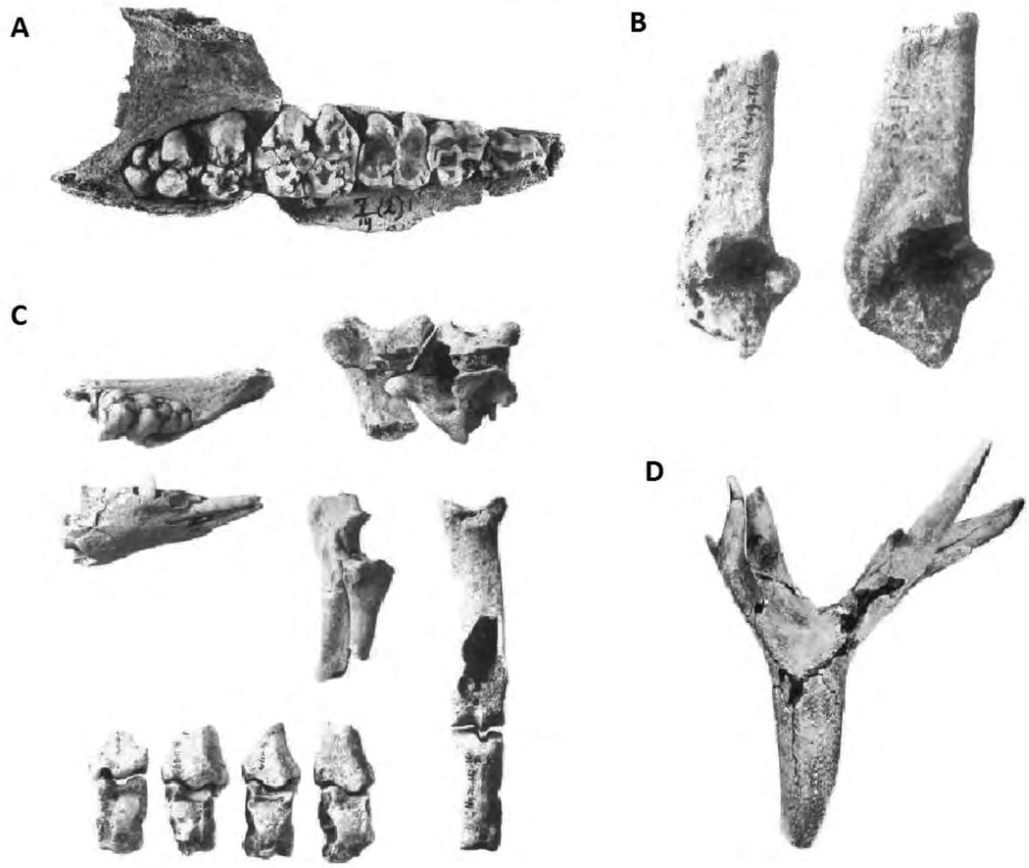


Figure 4.26: Selection of pig bones and red deer antler from Newgrange (not to scale). (A) Pig Maxilla (van Wijngaarden-Bakker, 1974: Plate LXVII.); (B) Fragments of the mandibula, fragmentary atlas and axis, proximal radius and ulna of pig, associated finds of distal tibia and astragalus and complete metacarpal and phalanx I of pig (van Wijngaarden-Bakker, 1986: Plate VII.); (C) Calcaneum of wild boar (right) and domestic pig (left) (van Wijngaarden-Bakker, 1986: Plate VIII.); (D) Red Deer Antler (van Wijngaarden-Bakker, 1974: Plate LXXIII.)

slaughtering seasons renders this pattern impossible to understand in spatial or chronological terms and thus its real significance currently remains enigmatic.

The Newgrange pigs were large, long-legged animals that generally resembled their wild ancestors. Males and females were of similar size with an average shoulder height of 68-82cm, with live weights of c. 75-100kg and a carcass weight of 53-75kg respectively. Van Wijngaarden-Bakker (1974: 338, 1986: 69) noted that the Newgrange pigs were among the largest domestic animals recorded in prehistoric Europe. The large size of the Newgrange animals is particularly evident when their average shoulder height of 76cm is compared with the average shoulder height of 71cm recorded among pigs from Durrington Walls (Wiltshire) and Mount Pleasant (Dorset), which is not much taller than the earliest European domestic pigs which probably had shoulder heights no greater than 70cm (van Wijngaarden-Bakker, 1974: 338; Serjeantson, 2011: 26). This could indicate that the pigs were bred specifically to be of large stature and were intended for consumption during feasting events. In addition an unfused calcaneum recovered from the eastern excavation unit was exceptionally large, suggesting it may have come from a young wild boar (van Wijngaarden-Bakker, 1986: 69-72, 75, 92).

The long bones of the front legs were always broken for marrow extraction, while c. 10-15% of the long bones from the hind legs showed no indications for marrow-fracturing (Figure 4.26). A concentration of vertebrae, some discovered in articulated state were present under the "yellow bank" which van Wijngaarden-Bakker (*ibid*.: 94, 100) interpreted as a "butchery area". In addition, examples of both fore and hind-leg joints which were still held together in an articulated state by muscular tendons when deposited were recovered (van Wijngaarden-Bakker, 1986: 61-63; Mount, 1994: 440-441). However, the frequency of these articulated associations was not calculated; the relative occurrence of left versus right hand joints was not reported; the distribution of these joints throughout the site was not presented; and the features from which they were recovered were not elucidated. Van Wijngaarden-Bakker (1986: 63, 74-75) interpreted the articulated pork joints and the absence of marrow extraction as evidence for the presence of smoked meat preservation. However, the occurrence of articulated fore and hind-leg joints and low instances of marrow extraction, may be more indicative of communal consumption in a feasting context, as has been recorded at such sites as West Kennet and Durrington Walls in southern Britain (Albarella and Serjeantson, 2002: 43).

4.5.2.4.3 Red Deer

An MNI of 10 red deer implies that it was not consumed frequently at Newgrange, but this currently represents the highest frequency of the species among Irish prehistoric sites (McCormick, 2007a: 84). The remains have a relatively even distribution across the site (Table 4.4). No sex ratio could be established for the deer, although the absence of skull fragments with attached antlers could suggest the presence of females. The animals appear to have varied in age, but no very young calves were identified. Long bones show evidence for marrow-fracturing, but the small bones show no evidence of butchery (van Wijngaarden-Bakker, 1974: 354-355, 1986: 87-89). Approximately one fifth of the deer remains are antler fragments, mostly found concentrated in the eastern excavation unit, occurring both within the pits (n=6) and on the OGL (n=11). Remnants from a single antler were recovered from Pit B within the 'great pit' (Figure 4.26) in the central excavation unit and a single fragment was recovered from "Level A". In the west, a single fragment occurred under the "yellow bank". All of the burr fragments were from shed antlers and these may have been collected between February and May (van Wijngaarden-Bakker, 1974: 353-354, 366, 1986: 88). Van Wijngaarden-Bakker (1986: Table VI) included the antlers in her MNI estimates for the presence of red deer on the site, despite the fact that none were conclusively attached to live animals when they arrived at Newgrange. However, these have been excluded from the MNI estimates utilized here.

4.5.2.4.4 Other Fauna

As outlined above, all of the horse remains may be of Iron Age (or later) date and thus will not be discussed further. The other faunal species will only be considered briefly as they predominantly occurred in chronologically uncertain “Level A” of the central excavation unit (Table 4.4). Sheep/Goat were less frequent in the older phases of the site (most notably under the yellow bank, the eastern pits and the timber circles), than in “Level A” where c. 57% of the remains occurred (van Wijngaarden-Bakker, 1974: 339-340, 1986: 76-78). Almost all of the dog bones found on the site were broken suggestive of butchering and marrow-fracturing, indicating that the dogs were occasionally eaten on the site, but the majority of the remains (c. 50%) occurred in “Level A” (van Wijngaarden-Bakker, 1974: 344-345, 1986: 79-81). Mountain hare appears to have been consumed on rare occasions at Newgrange (van Wijngaarden-Bakker, 1974: 356, 1986: 90, 106), but again c. 50% were found within “Level A”. The migratory bird remains deemed to have been of prehistoric origin were also recovered almost exclusively from “level A” and the bones from the eastern and western excavation units are of unclear antiquity (van Wijngaarden-Bakker, 1974: 357-358, 360, 1986: 92-93). The presence of an incomplete fox skull and the brown bear foot bone in the eastern area is interesting, although there is no evidence to indicate that these (or the wild cat found in the same excavation unit) were consumed (van Wijngaarden-Bakker, 1974: 350, 1986: 90-91, 93). It is feasible that these particular specimens represent hunting trophies.

4.5.2.5 Meat Consumption

In order to try and understand the animal remains in terms of human consumption the current study has attempted to estimate MNI ranges for consumers based on the meat provided by animals represented. As the chronology of the site and the composition of deposits in various parts of the site are unclear it is not feasible, however, to discuss meat composition comprehensively. Mount (1994: 440) discussed the total weight of usable meat represented at Newgrange, so a MNI range of consumers has been calculated for the site in total in order to get an overview of potential numbers who consumed meat based on the excavated evidence although it represents material which accumulated over a substantial period of time. Additionally, estimations have been made for a number of ‘closed’ contexts which do not include ‘problematic’ horse remains and thus appear to be of Late Neolithic and Chalcolithic or possibly Early Bronze Age date. These are the area under the “yellow bank”, which could potentially represent the remains of a single large-scale event, two pits located in the central area, and two pits from the eastern timber circle.

Calculating the MNI for consumers involves many unavoidable uncertainities as, for example, the duration of the events represented is unknown, as is the make-up the community involved (in terms of men, women and children). Furthermore, as noted by McCorriston et al. (2012: 54) some people need fewer calories and additional food-stuffs are likely to have supplemented meat at communal consumption events. Fewer people might have consumed an unusual surfeit on a given occasion, animals may have been eaten over several days, and some meat may have been preserved through drying and subsequently removed from the site. MNI ranges employing upper and lower-end estimates have, therefore, been calculated in order to give conservative estimates of the numbers involved in consumption and offset some of the variability.

Firstly, as a feast could have lasted a number of days an estimate of 3Kg of meat consumption per person has been used to provide the lower end of the MNI. Secondly, following McCorriston et al., (*ibid*.) the upper end of the MNI is based on kilocalorie-minimum dietary requirements per person per day, as consumption events could have lasted a single day. McCorriston et al. (*ibid*.) used the FAO–WHO estimate of a 1,990-kilocalorie-minimum dietary requirement for their calculations, but in order to try and account for some of the variability in human consumption the upper- and lower-end estimates of 2000 and 1600 kilocalorie-minimum dietary requirements per person per day have been utilized here. A Kg of beef provides a little more than 2000 kilocalories, but as the amount of energy provided varies between cuts and kilocalories provided by pork, venison etc. also vary, a conservative estimate of 1500 kilocalories per Kg of meat has been used. These figures were employed in order to calculate the number of 'meat meals' consumed, where each meal is equivalent to one day's energy requirement for an adult. The amount of consumable meat provided by each animal follows the figures estimated by van Wijngaarden Bakker (1986) and those used by Mount (1994). The method of calculation employed here is based on that employed by McCorriston et al. (2012: 54) and may be described thus:

Kgs meat x 1500kcal / kcal-min p.p.

Finally for the upper-end estimates for the MNI of consumers, an average for the figures for 'meat meals' consumed was calculated. This average was used in order to compensate for varying levels of consumption, the probable consumption of additional food-stuffs and the removal of portions of usable meat from the site. The upper and lower-end figures were then rounded up to give the final MNI range estimates of consumers which represent what the current author considers conservative figures.

Feature	Animal MNI	Estimated Meat KG	3KG Meat Per Pers. MNI	2000KCAL Per Day MNI	1600KCAL Per Day MNI	MNI Consumers Estimate
Site Total Animals	391	46,408	15,469	34,806	43,508	15,500-39,150
Site Total Pig & Cattle	312	41,390	13,796	31,043	38,803	13,800-35,000
Under Yellow Bank	139	14,407.5	4,803	10,806	13,507	4,805-12,160
Pit B in 'great pit'	5	797.5	266	598	748	270-675
pit by hearth 3	5	557.5	186	418	523	190-470
Eastern Circle Burial 4	5	560	187	420	525	190-475
Eastern Circle Burial 8 (a)	3	335	112	251	314	115-285
Eastern Circle Burial 8 (b)	3	195	65	146	183	65-165

Table 4.5: Estimated MNI of consumers for the entire site and the various 'closed contexts' at Newgrange

For the total amount of animal remains excavated at Newgrange Mount (1994: 440; Table 1) estimated the Kgs of usable meat at 46,408 from the 391 MNI animals identified. This figure leads to an estimated MNI range of 15,500-39,150 people involved in communal consumption at the site. As noted above, this number represents activity at Newgrange over a chronologically uncertain period, but certainly includes both Late Neolithic-Early Bronze Age and Iron Age events. It is possible that the majority of the 106 cattle and 206 pigs identified belong to the Late Neolithic-Early Bronze Age horizons. The useable meat they would have provided is 41,390Kgs yielding a MNI range of 13,800-35,000 consumers (Table 4.5), but again there are chronological uncertainties, and the remains are likely to represent multiple events.

Feature	Reference	Cattle	Pig	Sheep /Goat	Deer	Dog	Total
Under Yellow Bank	van Wijngaarden-Bakker 1986	25	104	1	1	2	139
Pit B in 'great pit'	van Wijngaarden-Bakker 1974	3	1	1	0	0	5
pit by hearth 3	van Wijngaarden-Bakker 1974	2	1	1	1	0	5
Eastern Circle Burial 4	Sweetman 1985	2	1	0	0	2	5
Eastern Circle Burial 8 (scenario a)	Sweetman 1985	1	0	0	1	1	3
Eastern Circle Burial 8 (scenario b)	Sweetman 1985	0	0	0	2	1	3

Table 4.6:The MNI animals represented within each of the 'closed contexts' at Newgrange

The first ‘closed context’ considered here is the area under the “yellow bank” where the faunal remains (Table 4.6) equate to 14,407.5Kgs of usable meat which translates into a MNI range of 4805-12,160 people involved in consumption during what could have been a single event (Table 4.5), although the potential more than one having taken place cannot be dismissed. This figure does imply that if this does in fact represent the remains of a single large-scale feasting event the numbers involved could have exceeded 12,000 individuals. Even if this represents multiple events, when we factor in the probability that other parts of the site were in use during the Late Neolithic, the MNI consumer range from under the “yellow bank”, which is conservative, could be a realistic gauge for attendance numbers for multiple large-scale events at Newgrange during the Late Neolithic.

The second ‘closed context’ considered is ‘Pit B’ in the ‘great pit’ (Table 4.6). The presence of the antler fragments does not suggest that deer was eaten and the calculation based on the cattle, pig and sheep/goat suggests these animals yielded 797.5Kgs of useable meat. This leads to an estimated MNI range of 270-675 participants (Table 4.5). The third ‘closed context’ is the pit located beside hearth 3 (Table 4.6). As van Wijngaarden-Bakker (1974: 366) described one of the cattle as a fully grown adult with a shoulder height of around 130cm and the other as a young animal, her minimum usable meat estimate of 135Kg for cattle has been used for estimating the weight of the latter in this instance. Here the total amount of usable meat calculation is 557.5Kg and the MNI range for people involved in consumption is 190-470 (Table 4.5). It is possible that the pit adjacent to hearth 3 and ‘Pit B’ located within the ‘great pit’ in the central excavation unit contain remains from single feasting events which potentially involved people from across the region.

It is uncertain if the remains from the majority of eastern timber circle pits represent the remains of a single event or if they represent remains from a number of individual events. It was advanced (Sweetman, 1985: 219) that the bones in pits 15, 18 and 25 and burial 39 could have derived from a single source. As it is also possible that the pit next to hearth 3 was in fact part of the eastern circle it was decided in the current study to calculate the MNI for pits as if they each represent a single event. It is only possible to calculate an estimated MNI for individuals involved in feasting for two eastern circle pits, ‘burial 4’ and ‘burial 8’. The contents of ‘burial 4’ (Table 4.6) are estimated to have been equivalent to usable meat of 560Kgs wich equates to a MNI range of 190-475 consumers (Table 4.5). As some uncertainty surrounded the identification of the remains contained within ‘burial 8’ (Table 4.6) two calculations have been performed: (a) involving one cattle, one deer and one dog, which is perhaps the more likely scenario, and (b) two deer and a dog. Scenario (a) suggests the presence of 335Kgs of usable meat and a MNI range of 115-285 consumers and (b) 195Kgs of usable meat with an estimated MNI range of 65-165 consumers (Table 4.5). Again if this represents a single feasting event 'burial 4' could have been comparable in scale to with the aforementioned pit close to hearth 3, but 'burial 8' may have been quite a local affair, particularly if scenario (b) is correct.

4.5.3 (3) Structured Deposition and Performative Paraphernalia

4.5.3.1 Structured Deposition

Due to the ambiguous nature of a number of the published Newgrange reports it is difficult to discuss potential evidence for structured deposition comprehensively, but there are a number of possible instances which may be referenced. For example, Mount (1994: 439) suggested that the three pits dug into the 'great pit' could represent instances of structured deposition. Of these three, 'Pit B' which contained the remains of three cattle, a pig, a sheep/goat and remnants of a red deer antler is perhaps the most likely candidate (Van Wijngaarden-Bakker, 1974: 366). Mount was correct to highlight the fact that these features need to be re-analysed and compared with the deposition of the pottery and lithic material, but there does not appear to be any indication in the excavation or specialist reports that any additional material was found in these pits.

Further potential instances in the central area include the series of pits which comprised "pottery concentration 4" (which included Grooved Ware, Classical Beaker and "Beaker influenced ware") whose dark fills also contained flint artefacts, flint debitage and animal bones (Cleary, 1983: 61; O'Kelly, 1983: 24; Roche, 1995). Another possible example from the central area was a large pit associated with hearth 8 which contained "pottery of various types". Two examples from the eastern area are the "lidded" oval pit adjacent to the hearth 1 which was filled with charcoal, charred seeds and Classic AOO Beaker sherds and the nearby oval pit which contained charcoal and sherds of Grooved Ware (O'Kelly, 1983: 15, 24; Roche, 1995). In the far western area a possible example is pit dug through the "yellow bank" to the north of orthostat GC9 which contained a chip from the face of highly polished speckled grey Tievebulliagh porcellanite axehead and "much animal bone" (O'Kelly, 1983: 41). At least some pig fore and hind-quarter joints were deposited in an articulated state within the main area in front of the passage tomb, which would be indicative of structured deposition (van Wijngaarden-Bakker, 1986: 61-63; Mount, 1994: 440-441), but as outlined above (4.5.2.4.2), the faunal report provided little information about these remains, so this evidence cannot be discussed further.

The deposits associated with the timber circles are certainly suggestive of structured deposition. In the case of the eastern circle Sweetman (1985: 219) noted that the faunal remains (which included pig, cattle, deer, and dog) were primarily from the relatively inedible parts of the animals

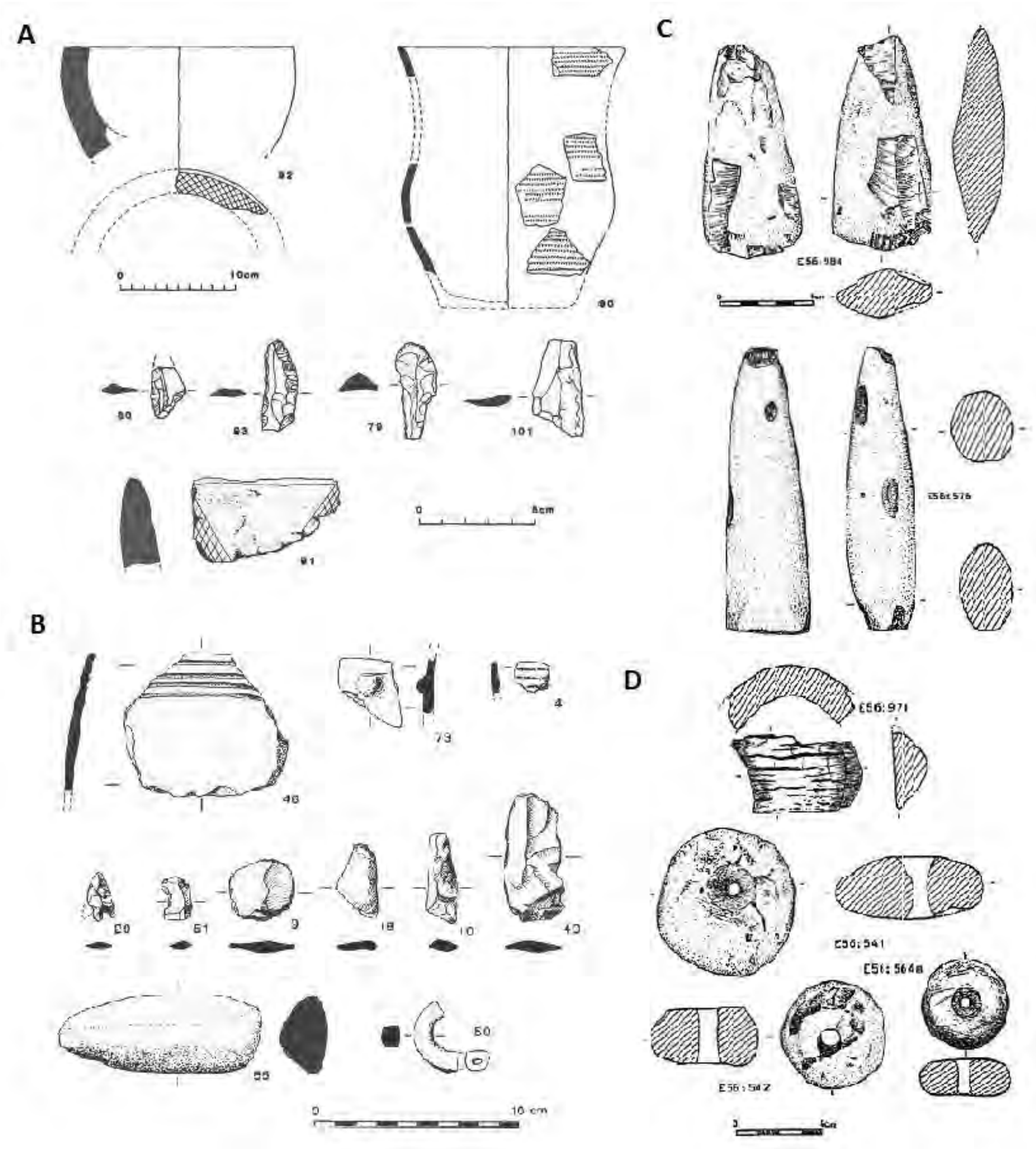


Figure 4.27: Structured deposition and performative paraphernalia at Newgrange. (A) Pottery, rim of stone bowl and flint objects from western timber circle (Sweetman, 1987: Fig. 4.); (B) Pottery and flint objects from eastern timber circle (Sweetman, 1985: Fig. 7.); (C) Stone axes (adapted from O'Kelly, 1983: Figs. 16-17.); (D) Perforated stone beads/pendants (adapted from O'Kelly, 1983: Fig. 18.)

and those from pits 15, 18 and 25 and burial 39 were similar in overall appearance suggesting that they may have come from the same source. All of the animal bones recovered had been fragmented to a greater or lesser extent and they were variously described as unburnt, smoked, scorched, partially calcined, totally calcined, and burnt. Additionally, some of the burnt bone from burial 13 was cracked and distorted suggesting it was burnt with the flesh on and the nine small burnt fragments found in burial 14, were found with some 'clinker' which had an appearance suggestive of representing burnt hair and flesh (Sweetman, 1985: 219-220; Mount, 1994: 437-

438). Grooved Ware was found in at least three of the pits associated with the circle (O'Kelly, 1983: 18, 21; Roche, 1995).

Between the eastern circle and Site Z was a group of 16 pits that contained charcoal fragments, animal bones and flint debitage, one of which also included sherds of Grooved Ware, as did a series of stakeholes (O'Kelly, 1978, 1983: 21; Roche and Eogan, 2001: 129; Carlin, 2011: 188). As stated by Mount (1994: 438) the deposits in the pits of the western timber circle appear to have been deliberate and there was an apparent emphasis on pig hind ankle bones among the faunal remains, with cattle fragments also occurring in pit 19. Pits 1, 2, 4, 17 and 19 also contained Beaker pottery and pit 6 the rim a carved stone bowl and the almost complete remains of a Middle Neolithic bowl-shaped pottery vessel. A number of the dug-features, including pits 1, 16 and post-hole 10, also contained deliberate deposits of burnt flint (mostly debitage but occasionally tools) (McCormick 1987; Mitchell, 1987; Sweetman, 1987: 291-294; Carlin, 2011: 186).

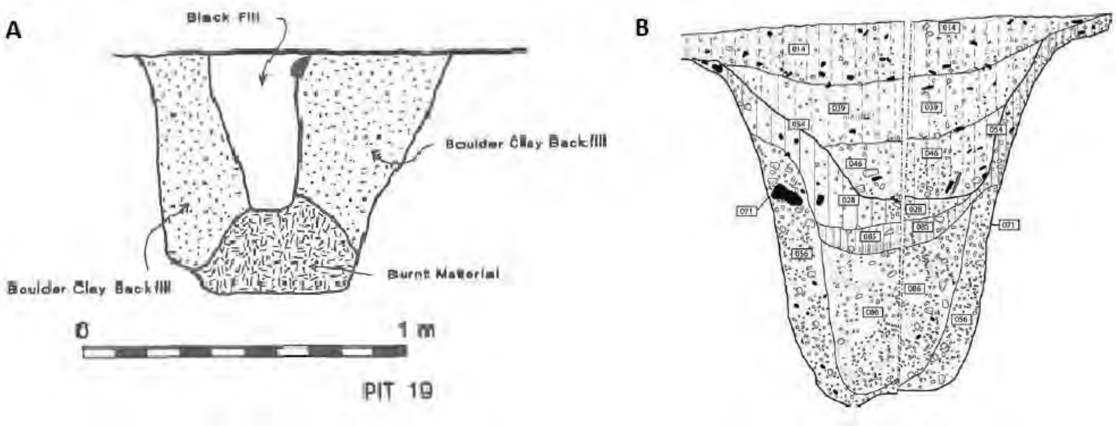


Figure 4.28: Comparison post-hole sections from the western timber circle at Newgrange and the Southern Circle at Durrington Walls. (A) East/west section of pit 19 from the western timber circle at Newgrange (Sweetman, 1987: Fig. 3.); (B) Section of post-hole 071 from the Southern Circle at Durrington Walls, showing re-cut pit in the upper fill (Parker Pearson, et al., 2008: Fig. 14.)

Sweetman (1987: 286, 295) advanced that there were two phases of activity at the western timber circle, the earlier being associated with the use of the large pits and the later with the filling-in of these features for use as post-holes and digging of new holes. This should perhaps be considered as a minimum number of phases however. As noted by Carlin (2011: 186), Sweetman (1987: 283, 287) grouped the five large pits (1, 2, 8, 9 and 19) together and the smaller pits (3, 4, 5, 6, 7, 12, 13, 16, 17 and 18) into a separate group. Each of the larger pits contained charcoal-rich basal deposits that Sweetmen interpreted as evidence for burning having taken place in situ (*ibid*.: 295). These were backfilled with sterile clay and later re-cut to contain what Sweetman interpreted as posts. Some of the smaller pits, including pits 4 and 17, were also filled with debris and then re-used as postholes. The six Beaker vessels from pits 1, 2, 4, 17, 19 were highly fragmented and three pots were represented by no more than a single sherd. Pit 6 contained the rim a carved stone bowl decorated with incised crossed-hatching and the almost complete remains of a Middle Neolithic ceramic bowl (McCormick, 1987; Mitchell, 1987; Sweetman, 1987: 291-294; Carlin, 2011: 186). Carlin (2011: 186-187) has suggested that the Beaker pottery occurred within conical re-cuts that were dug into pre-existing pits which Sweetman (1987: 286) interpreted as the remains of former posts. Carlin has argued that the artefacts represent abandonment deposits that were deliberately placed into the voids created by the rotting or the removal of the posts. Another alternative explanation is that these conical features actually represent the re-cutting of the pits for depositional purposes (Figure 4.28). Carlin concluded that the Beaker pottery was deposited in secondary contexts that post-date the primary phases and most likely represent the final stages in the use-life of this monument. In this context it is perhaps notable that at Durrington Walls (Parker Pearson, et al., 2007; 631; Thomas, 2007: 149) the postholes within the Southern Circle were re-cut. The bases of these re-cut pits contained deposits including Beaker sherds and animal bones and the secondary finds from these features massively outnumbered those from the primary packing.

Excavation Unit	Context	Artefact(s)	Reference
Eastern Area OGL	base of earth/stone layer	lignite bracelet fragment	O'Kelly 1983: 46
Eastern Area Pits	"large" pit (upper fill)	polished ivory point (part of implement?)	O'Kelly 1983: 48, 52
Eastern Circle	top soil (cutting 4)	Part of small lignite ring	Sweetman 1985: 211
Central Area Level A	surface quartz/granite layer	Two sandstone beads/pendants	O'Kelly 1983: 46
Central Area Level B	pits at base earth/stone layer pottery concentration 3 embedded in sub-soil	6 polished bone pins polypod bowl sherds 3 serpentine disc-beads	van Wijngaarden-Bakker 1974: 366-367 O'Kelly 1983: 52 O'Kelly 1982: 189-190
Western Area	surface quartz/granite layer	sandstone or slate bead/pendant	O'Kelly 1983: 44
Western Circle	Pit 1 (top of fill) Pit 6 (top of fill)	polished bone pin point bone pin point	Sweetman 1987: 294

Table 4.7: Distribution of performative parephenia at Newgrange

Performative Paraphernalia

In terms of performative paraphernalia a number of items arguably involved in the construction of identities and the negotiation of social relationships were recovered at Newgrange (Figure 4.27). Items that appear to fit into this category include the remains of a number of pins, part of a ring, part of a possible bracelet, some beads/pendants and sherds of a polypod bowl (Table 4.7). The latter remains of two polypod bowls from pottery concentration 3 (van Wijngaarden-Bakker,

Excavation Unit	Context	Artefact(s)	Reference
Eastern Area OGL	close to hearth 1 close to hearth 1	cutting edge chert axe bronze Killaha-type axe	O'Kelly 1983: 41 O'Kelly & Shell 1979
Eastern Area Pits		converted body fragment from possible chert adze	O'Kelly 1983: 41
Eastern Circle	Pit (upper fill) OGL OGL top soil (cutting 3)	damaged "impractical" mudstone axe half black chert adze (butt-end sheared off) two-thirds diorite axe/chisel (butt-end sheared off) small mudstone adze	O'Kelly 1983: 41 O'Kelly 1983: 41 O'Kelly 1983: 41-44 Sweetman 1985: 211
Central Area Level A	surface of quartz/granite layer	Unfinished Tievebulliagh porcellanite axe	O'Kelly 1983: 44
Central Area Level B	Embedded in sub-soil	Fragment flint axe	O'Kelly, 1982: 188
Far Western Area	pit dug through "yellow bank"	Tievebulliagh porcellanite axe chip	O'Kelly, 1983: 44

Table 4.8: Distribution of axes at Newgrange

1974: 366-367; O'Kelly, 1983: 52) are particularly notable finds as they are suggestive of narcotic use and thus should also be considered performative paraphernalia. Although a number of the axes and related objects discovered outside Newgrange 1 were undoubtedly utilized practically, it is possible that some may have had or served a performative function, possibly ceremonial in nature and/or potentially associated with the construction of identity and the negotiation of social relationships. Stone axes or fragments thereof include examples from across the site, while the eastern excavation unit contained both the only bronze axe on the site and significantly more stone axes than the other excavated areas in front of the main passage tomb (Table 4.8).

4.5.3.2 Underrepresentation of Cattle and Pig Skulls

Mount (1994: 440) suggested that the large numbers of pig and cattle teeth found in the central excavation unit near the tomb entrance may represent skulls from animals found in the western part of the site where they were underrepresented. He concluded that the deposition of animal skulls in front of the tomb entrance could represent an aspect of ceremonial activity at the site. In order to test this hypothesis some rudimentary MNI calculations have been compiled for cattle and pig skulls in each excavation unit (Table 4.9). In the absence of a complete record of tooth elements in the published reports the MNI calculations are based on the total number of teeth found in each area divided by the number of teeth an animal has. In the case of cattle, van Wijngaarden-Bakker (1986: 31) suggested that the ratio of upper and lower teeth represented were consistent in each area, and thus the teeth originally belonged to intact jaws or skulls. This would appear to indicate that this rough method of calculation should provide a reasonably accurate MNI estimate for the number of skulls present. The same method was used to calculate the MNI for pig skulls, but as there was a possible over under-representation of upper teeth, a second calculation was made based on lower teeth alone to provide MNI ranges, but this did not affect the results considerably. These skull MNI estimates were then compared with van Wijngaarden-Bakker's (1986) MNI estimates for the animals present in each excavation unit.

Total Cattle teeth 2148						
	Western area		**Central Area**		**Eastern Area**	
	Under Yellow Bank	OGL	Level A	Level B	OGL	Beaker pits
Total Teeth	262	269	972	108	665	74
MNI Skulls	9	9	31	4	21	3
MNI Animals	25	21	32	11	25	
Total Pig teeth 1295						
	Western area		**Central Area**		**Eastern Area**	
	Under Yellow Bank	OGL	Level A	Level B	OGL	Beaker pits
Total Teeth	153	218	642	34	223	25
MNI Skulls	4	4-5	15-16	1	4-6	1
MNI Animals	104	56	26	4	18	

Table 4.9: Distribution of cattle and pig teeth at Newgrange and MNI estimates of the numbers of skulls represented

The comparison of the skull and animal MNI estimates for cattle (Table 4.9) in the central and eastern areas suggest that the skulls may be slightly underrepresented, but not significantly so. However, it does appear that cattle skulls may be somewhat underrepresented in the western area. Pig skulls may be also be underrepresented across the site (Table 4.9), but the proportion of under-representation is particularly striking in the western area. In this context it may be significant that van Wijngaarden-Bakker (*ibid*.: 52) noted that taphonomic loss was consistently greater in the eastern unit than the western unit. Thus, it appears that Mount (1994: 440) was correct in saying that pig skulls were underrepresented in the western area. However, there is no indication that the cattle and pig skulls that are currently unaccounted for in the western area were deposited or discarded near the tomb entrance. It should however be noted that skull bones were among the unidentifiable fragments recovered on the site (van Wijngaarden-Bakker, 1986: 23-24), but these bones would not necessarily account for the 'missing' skulls and in the absence of a distribution of unidentifiable elements it can only be assumed that the teeth provide a reasonable approximation for the number of skulls present in each area. The MNI for cattle skulls in the central and eastern areas in particular would appear to support this hypothesis. As only

40% of the area around Newgrange has been excavated it is possible that the 'missing' skulls are located in an unexcavated part of the site, but it is also feasible that the skulls or jaw elements were removed from the site in commemoration of feasting activity.

4.6 Discussion

The comparisons between the evidence at Newgrange and Grooved Ware feasting sites in Britain, most notably Durrington Walls, are clear. Newgrange can certainly be characterized as a special location with a long history of ceremonial activity. As is the case with Durrington Walls, the site includes a winter solstice alignment, Late Neolithic timber circles, and evidence for occupation associated with cooking facilities and deposition features. Both sites display evidence for structured deposition associated with timber circles and the presence of possible 'performative paraphernalia'. Bayesian analysis suggests that the Durrington Walls 'settlement' was constructed c. 2525-2470 cal. BC and ended c. 2480-2440 cal. BC, with the henge enclosure being constructed c. 2485-2455 cal. BC and the enclosure of Woodhenge c. 2480-2030 cal. BC (Viner, et al., 2010: 2813; Parker Pearson, et al., 2007: 628, 2011: 83-84). In the current study it has been estimated that there were two main phases of overlapping activity outside Newgrange, the first being associated with Grooved Ware c. 2628-2452 cal. BC, the second with Beaker pottery c. 2494/2476-2284/2273 cal. BC. It appears feasible that the majority of this activity, predominantly associated with Grooved Ware, took place c. 2582/2568-2452 cal. BC. This would appear to indicate that the Durrington Walls and Newgrange activity was contemporaneous.

The faunal material at Newgrange includes large proportions of pig c. 61% and cattle c. 32%, which is comparable to the percentages found at Durrington Walls. As at the latter site, these animals do not appear to represent "local" populations, instances of marrow extraction are proportionally low and there are indications that the animals were consciously bred to be slaughtered in autumn/early winter and with a view to mid-winter feasting. At both sites there is an under-representation of animal skulls. It is possible that these 'missing' cattle and pig skulls are located in unexcavated areas of the sites, but it is feasible that they were removed in commemoration of feasting activity. Although not consumed frequently at Newgrange, the red deer assemblage represents the highest frequency of the species among Irish prehistoric sites and the remains of one possible wild boar was also identified. Recent cross-disciplinary research by FitzPatrick et al. (2015: 27, 29-30) combining archaeology, historical sources and 'geomythology' has identified a locale around Pighill and Carrigdexter c. 7.5km west of Newgrange and within 1km north-west of the River Boyne (Figure 4.29) as an area that is geologically suited to hosting both deer and wild boar, and historically associated with their presence. It may be advanced that

Figure 4.29: The location of Pighill and Carrigdexter to the west of the Boyne Valley (Fitzpatrick, et al., 2015: Plate 5.)

this naturally suitable habitat represents a likely location of hunting grounds during prehistory and perhaps the area from which the deer and boar found at Newgrange were sourced.

In the current study it has been estimated, based on potential meat consumption, that large-scale feasting at Newgrange could have involved c. 4,800-12,000 individuals and smaller events between c. 100-200 and c. 200-500 individuals. Based on estimated labour involved in the post-'settlement' enclosure at Durrington Walls, Parker Pearson (2007: 140-141; et al. 2008: 160, 2011: 84) has advanced a figure of c. 4000 individuals congregating at the Grooved Ware associated site. The lower end of the Newgrange estimate, i.e. c. 4,800 people, is higher than this (and the upper end of the Newgrange estimate, i.e. c. 12,000 is a lot higher). Unfortunately it has not been possible to calculate possible meat consumption at Durrington Walls for direct comparison as MNI estimates have not been advanced for the recently excavated material as yet. Nevertheless, it does appear feasible that similarly large numbers attended winter solstice events at both locations and numbers of attendees probably exceeded 4,000 on these occasions.

4.7 Conclusion

The activity at Newgrange, the majority of which it has been argued occurred c. 2582/2568-2452 cal. BC, displays many of the characteristics which could be expected on a feasting site, including the spatial distinction of the location, food preparation and deposition features, the potential occurrence of structured deposition, the under-representation of animal skulls, and the presence of possible performative paraphernalia. The evidence at Newgrange also appears to be consistent with Grooved Ware-associated sites and feasting activity in Britain, including the predominance of pig and high numbers of cattle in the faunal assemblage. In addition, the activity at Newgrange is notably similar to, and potentially contemporary with, that at Durrington Walls, which is as noted previously, the quintessential Late Neolithic feasting site in Britain. It has been advanced that large-scale feasting at Newgrange could have involved c. 4,800-12,000 individuals, as well as smaller events with between c. 100-200 and c. 200-500 individuals. If these estimates are correct it suggests that the importance the Boyne Valley had during the later 4th millennium BC continued into the mid-3rd millennium BC. This could indicate that Newgrange and the Boyne Valley were a centre of ‘religious’ or ‘ceremonial’ significance connected with the yearly journey of the sun and associated with a supra-regional identity throughout a large portion of the Neolithic. These propositions will be engaged with further in Chapter 7, but before doing that, the ‘cultural’ frame of reference within which this activity occurred must be established further. To this end, the wider European context will be elucidated in the following chapter by outlining Eurasian ethno-historical evidence that describe three-tier cosmology, and by exploring solar-journey-associated mythology and the possible symbolic representation of such ideas in Neolithic-Bronze Age Europe.

Section II
COSMOLOGY & IDENTITIES

5 EURASIAN COSMOLOGY: THE SUN, THE BOAT AND THE MILKY WAY

5.1 INTRODUCTION

As noted previously, from an archaeological perspective a more refined understanding of Bronze and Iron Age mythological and cosmological belief systems has begun to emerge (e.g. Kaul, 1998, 2014; Kristiansen, 2012, 2014; Waddell, 2012, 2014; Melheim, 2013; Ling and Rowlands, 2015). The current chapter seeks to investigate whether it is possible to identify the existence of three-tier cosmologies and solar journey-associated mythologies connected with the importance of the winter solstice throughout the European Neolithic and Bronze Age periods. As such, the aim is to explore whether Neolithic-Bronze Age symbolic and iconographic evidence supports the existence of comparable cosmological and mythological belief systems across Europe, not only during, but prior to the 2nd millennium BC. In each of the following sections an aspect of Eurasian mythology which contains explicit references to three-tier cosmology and/or the daily solar journey will be outlined. These discussions will then be followed by a review of evidence for corresponding symbolic and iconographic representations in Neolithic and/or Bronze Age Europe. While it could be suggested that a degree of selectivity is present in the scope of the iconography discussed in the current chapter, it may be advanced that such animals as deer, elk, bees, butterflies etc., which are depicted in various geographical areas, may be more closely associated with mythologies and aspects of cosmology connected with the 'economic year' or 'economic calendar'. As such, discussions of such representational 'sub-sets' are outside the scope of the current study.

The first aspects of Eurasian mythology explored are creation myths and journey of the sun myths and a review of solar symbolism. The second section outlines the relationship between boats and the suns daily journey and also reviews evidence for representations of boats. In this context it is argued that a number of boat representations are present within the repertoire of Irish megalithic art. The third section explores the relationships between the Milky Way, rainbows and the journey of the sun. It is possible that various types of image were connected with the representation of ideas associated with these concepts and each is considered separately. These include 'bow symbolism', representations of 'acrobats' and the potentially interconnected 'mushroom-shaped', lotus/lily/ivy blossom, 'ramiform' and 'arboriform', and 'idol' symbols. The following three sections outline solar-journey and Milky Way associated mythologies and related symbolism of horses, birds and cattle. Each section is followed by a review of evidence for representations. The penultimate section discusses the connections and inter-changeability of serpentiform and marine species symbolism and their relationships with a three-tier cosmology, the daily solar journey and the Milky Way. Representations of marine species and serpentiforms are also discussed separately. The final section discusses whether symbolism associated with a three-tier cosmology and/or the daily solar journey could have been associated with weapons (primarily axes, daggers and bows-and-arrows) and/or their iconographic representations.

5.2 Feasting, deities, fertility & regeneration

Sanctuaries or temples are often the locales at which seasonally scheduled feasts are held, especially when the deity of the sanctuary is celebrated at a specific time (Ervynck, et al., 2003: 433; Wright, 2004a: 127; McCorriston, 2013). When tied to the seasonal cycles feasting can involve the performance of contracts between believers, deities and/or ancestors and these may be materialized through offerings, often involving animal sacrifice, symbolic consumption by the dead/deities, or participants eating ritual food (Robertson, 1984; Cacopardo and Cacopardo, 1989; Hastorf, 2003: 547, 2011: 216; Lentacker, et al. 2004; deFrance, 2009: 137-138). While the extent to which animal sacrifice was practiced across the Iron Age Celtic World is difficult to determine, it may have been incorporated into seasonally-scheduled feasting. Feasting, if not animal sacrifice, at Iron Age ceremonial sites is indicated by references in early Irish texts and mythologies, Classical writings, and archaeological evidence (Green, 2002: 92-127; McCormick, 2007a, 2007b, 2009; Sherwood, 2009: 200-202). In Ireland and elsewhere in the Celtic world symbolic associations between common ‘feasting animals’ (i.e. cattle, pigs and to a lesser extent deer) and strength, power, the supernatural, deities and ideas of fertility and regeneration. For instance, the aggression, potency, and seasonal antler regeneration of stags connected them with such concepts and potentially cyclical symbolism (Green, 2002: 230). Boars and pigs were revered for their strength and ferocity in Irish and Welsh tradition and were associated with fertility (Green, 2002: 170; Collins, 2006: 162, 172). Connections with fertility and regeneration is further emphasized by their role in Otherworld feasting where they were cyclically and eternally killed, eaten and re-born (Green, 2002: 170-171; Sherwood, 2009: 202). The symbolic importance of wild aurochs is likely to have derived from a combination of their size, strength and fearsome nature (Goring-Morris and Belfor-Cohen, 2011: 68), associations described in Classical Roman sources (Twiss, 2008: 423). Domestic bulls carried similar symbolic connections and in the Celtic world they were revered and associated with fertility and regeneration (Green, 2002: 220) and as outlined further in Chapter 6 (6.3.2), various Irish deities were associated with cows and fertility (see also Green, 2002: 184-185; Sherwood, 2009, 202-203, 205-206). In the following chapter symbolic and iconographic evidence which may support the existence of three-tier cosmologies and solar journey-associated mythologies connected with the importance of the winter solstice across Europe, and in Ireland, during the Neolithic and Bronze Age periods will be reviewed.

5.2.1 Stability of Cosmology and Mythology as Oral Traditions?

In an influential study Vansina (1985: 186-200) outlined the limitations and possibilities of utilizing oral traditions in archaeological (and historical) interpretation, and the main points have been outlined in Table 5.1. In the current context Vansina's (1985: 190-193) discussion of 'selectivity and interpretation' and the degree of limitations is particularly relevant and must be contextualized from a mythological perspective, as these differ from historical or genealogical accounts. Mythological narratives and traditions do present a 'present' view and their transmission over time undergo processes of selection and streamlining, but unlike 'historical' narratives, mythological and cosmological traditions appear to undergo a concurrent process of cumulative elaboration as new technologies, practices and social structures are legitimized or 'naturalized', and also through integration into the cosmological system. This leads to narratives becoming both 'streamlined' as essentials are kept, but concurrently more elaborate over time as relevance to the 'present' is maintained. In addition to these trends are the processes which involve the reformulation of deity pantheons, which can involve the integration of previous deities into single figures, the splitting of single figures into a number of new deities, and the redefinition of a deities role and/or associated attributes within the pantheon (see Olmsted, 1994 for examples).

Mythologies and cosmologies have, in Vansina's (1985: 193-196) terminology, inherent interpretative limits and cannot be transmitted or 'updated' without concrete reference to the message itself. As such, the underlying structures show stability, while the framing and details of the narratives may be changed and manipulated for social or political reasons (Vansina, *ibid*.: 190, see also Chapter 4). For instance, the manipulation of mythology to legitimize 'polis-politics' is evident in the framing of activities in the Homeric Hymn to Demeter to resemble the political culture of Archaic and Classical Greece. This would have had the effect of projecting 'social norms' upon those contemplating the myth and as propaganda for the polis 'way of life'. For a contemporary Greek, the myth would have echoed aspects of their own society. However, for a Mycenaean, their society would have been cast as unnatural, as it differed from the 'normalized' Greek structures reinforced within the revised myth (Al-Maini, 2009). Notwithstanding, the 'essentials' of the 'original' myth must have been maintained as the alterations were accepted within Mycenaean areas.

<table>
<tr><td></td><td>THE LIMITATIONS OF ORAL TRADITION AND OUTSIDE SOURCES</td></tr>
<tr><td>1</td><td>Chronology and Interdependence</td></tr>
<tr><td colspan="2">Correlating oral data or written accounts with archaeological sites is difficult.

When there is a link between a site and an asserted event in oral tradition, dating could be possible.

A link between tradition and a site can be forged and merely rest on feedback from the site into the tradition.

Written sources also do not always obviously date or confirm oral traditions because the interests of the writers diverged so much from those of oral composers.

With written sources, as with archaeological sites, dating is sometimes possible and sometimes not.

Independent confirmation by other sources of events and situations may not be easily achieved as there is often little overlap.

Cases of overlap do occur where oral tradition confirms or completes written accounts.</td></tr>
<tr><td>2</td><td>Selectivity and Interpretation</td></tr>
<tr><td colspan="2">Selectivity occurs mainly for social [or political] reasons.

Cultural selectivity results in losses that become bigger the more remote events are.

Causal links tend to be reduced to rudiments, or general causes linked to worldview are introduced.

Traditions correspond to the ‘present’ view of reality and of the world.

Selectivity implies discarding certain information one has about the past and from that pool of information keeping only what is still significant in the present.

Interpretation means to alter information from the past to give it new meaning and as interpretation is more creative than selection, but not to the point that all is rejected.

With oral traditions the processes of selection and streamlining continue so that they show the impact of x generations of past-presents, and the longer that time interval is, the less they resembles a written document.</td></tr>
<tr><td>3</td><td>Degree of Limitations</td></tr>
<tr><td colspan="2">As traditions got older than 100 years the limitations become bigger, but different types of evidence and genres show different impacts.

Unconscious testimony is not affected, as is common in ‘tales’, but they cannot be dated very far backwards.

Memorized wording escapes these limitations, but then the glosses that are necessary to understand such sources do not.

Prayer formulas cannot be changed, even if they are no longer understood.

Poetry and song are excellent sources when they contain historical data and assert events or situations, but most of them, however, are allusive only. They tend not to be of a great age because, when they are no longer relevant, they are usually forgotten.</td></tr>
<tr><td></td><td>THE UNIQUENESS OF ORAL TRADITION</td></tr>
<tr><td>1</td><td>As a Source</td></tr>
<tr><td colspan="2">Messages encompass written sources, iconographic sources, oral history, and oral tradition.

Apparently more subjective sources (the messages) often more objective than the apparently less subjective sources (the direct evidence), as there are inherent interpretative limits contained in messages, whereas nothing limits the interpretation of direct evidence.

Even though one must search for symbolic significance and intended meaning in oral traditions, one is never allowed to interpret them without any concrete reference to the message itself.

Oral history and oral tradition must be reproduced over time, meaning that they accumulate interpretations. However, no matter how many successive encoders have altered original messages through selection or interpretation, they are also restrained by the previous interpretations.</td></tr>
<tr><td>2</td><td>As Inside Information</td></tr>
<tr><td colspan="2">Not all traditions are automatically unreliable, even though all have limitations.</td></tr>
</table>

Table 5.1: The limitations of oral tradition and outside sources (adapted from Vansina 1985: 186-200)

Witzel (2012: 376) has argued that the common characteristics and mythological motifs (or traits) found throughout Eurasian and North African creation myths display features that indicate the influence of early, foundational cultural features on successor cultures. He suggests that these traits were established at an early stage and while adaptations of older myths and mythologies have been made everywhere and at various times, these motifs remained central to their underlying structures. As is the case with all oral histories and traditions (Vansina, 1985: 195-196) accumulative 'interpretation' has affected the development of mythologies/cosmologies, but no matter how many successive encoders have altered original messages through selection or interpretation, they are also contrained by the previous interpretations. Additionally, new versions are contrained by the structure and 'essential' elements of older ones as these represent 'truths' which must be retained to 'legitimize' the elaboration and framing of newly developed versions.

The Scythian Genealogical Myth	
Herodotus (4.5)	This version is brief, stating that the parents of the first man, Targitaos, were Zeus and a daughter of the river Borysthenes.
Herodotus (8-10)	Herodotus' second version is narrated in detail. Herakles with Geryon's cattle reached a Scythian wasteland. His mares disappeared while he was asleep; looking for them he arrived at a land named Hylaea (Woodland). There, in a cave, he found a creature which was half-female, half-snake. She told him that she was the mistress of the country. This monster kept the horses, until Herakles gave her three sons; the youngest, named Scythes, became the forefather and first king of the Scythians.
Valenus Flaccus (6.48-59)	This account states that the Scythians were descendants of Colaxes, the son of Jupiter and Hora, a nymph with a half-animal body, living near the springs of Tibisis.
Diodorus Siculus (2.43)	In this version, the first Scythian named Scythes, who was also the first king, was the son of an earth-born snake-limbed maiden, impregnated by Zeus.
Tabula Albana (IGXIV 1293 A 93-96)	In the epigraphic version, Heracles would unite with a daughter of another river-god, Araxes, whose name was Echidna. The offspring of this union were Agathyrsus and Scythes, the Progenitors of Scythians.

Table 5.2: The Scythian genealogical myth (adapted from Ustinova, 2005)

An example can be seen in the interaction between Greeks and the Iranian-speaking peoples of the Black Sea region (Scythians, Sindians and Maeotians), that began in the late 7th century BC and led to the fusion of cultural elements. As outlined by Ustinova (1998, 2005: 64-66), following the arrival of Greek influence, the pre-existing belief systems, cosmology, and deities of the region contributed considerably in the development of the newly forming Greco-Scythian pantheon. This is evident in the emergence of such Hellenised deities as Apollo Iatros (Ustinova, 2009) and Aphrodite Ourania (Ustinova, 1998, 2005). It is particularly conspicuous in that of Aphrodite Ourania (who developed from Argimpasa), who became the divine patroness of Scythian royal dynasties by the 4th century BC. She was also a pivotal figure in the Scythian origin or genealogical myth, five main versions of which are preserved (Table 5.2) (Ustinova, 2005).

Upon reviewing the two variants preserved by Herodotus, Lincoln (2014) has identified political manipulation of the myth which contains deities, etymologies and cosmological constructs attested in Iranian/Zoroastrian tradition. The version upon which the first Herodotean variant was based culminates in the establishment of kingship and appears to have been utilized as a vehicle for the assertion of (a) the supremacy of the Scythians royal line and the right of their descendants to rule and (b) the superiority of Scythians over other peoples. He suggests that Greek colonists re-named the head of the Pantheon 'Zeus' prior to its transmission to Herodotus, rendering the Scythian origin 'half-Greek', problematizing the claim of Scythian superiority. The second Herodotean variant is more thoroughly Hellenised in ways that assert (a) the superiority of Greeks over Scythians, (b) the dependence of Scythia on Greece for whatever 'civilizing' arts it has come to possess, and (c) the superiority of the most Hellenized Scythians over their northern neighbours. Manipulation of this myth following interactions with the 'Roman world' is apparent in the framing, but it was the retention of essential elements from the Iranian/Zoroastrian cosmological constructs and the amalgamation of Roman with pre-existing local deities that 'legitimized' the new versions of the myth and would have rendered them acceptable to wider society.

It may be argued that mythologies/cosmologies do show considerable stability over spans of centuries, as is common to oral histories and traditions on the whole. Witzel (2012: 437) has argued that cross-cultural comparisons indicate that once established motifs persist over considerable time spans. This is partially explained by the fact that myths are transferred to younger generations through the socialization process and communities require myths to structure and explain their collective experiences over the *longue durée*. In addition, as emphasized by Waddell (2014: 26), oral traditions do not necessarily become unstable or corrupt within a few hundred years, because they are (among other things), likely to have played an important role in maintaining group identities and structuring social interaction. This has recently been demonstrated in the case of the Tlingit people of south-eastern Alaska (Crowell and Howell, 2013), where oral traditions have been judged to be strongly historical for some 850 years. Given that Irish monastic scribal recording began in the 7th or 8th century AD, evidence for similar time-depth in Irish tradition was proposed by Warner (1990). He argued that the Corlea trackway (Co. Longford) dendrochronologically dated to 148-147 BC, may have been the basis of the trackway said to have been constructed across Lamrach bog under the directive of Eochaid Airem in *Tochmarc Étaíne* (*the Wooing of Étaín*) in the 14th/15th century AD *Yellow Book of Lecan*. Potential corroboration for this proposal was suggested to come from the 17th century AD *Annals of the Four Masters* which report that Eochaid Airem was a ruler between 142 and 116 BC.

5.3 CREATION MYTHS AND THE JOURNEY OF THE SUN

A number of common characteristics are found throughout Eurasia and North Africa in mythological creation myths including primeval waters, a floating earth, the world egg, the world tree/pillar/mountain and combined forms thereof (Leeming, 2010; Witzel, 2012: 112-137). The widespread distribution, yet noticeable variation in the occurrence of these features, suggests that these concepts may have been established at an early stage. An overt creation myth appears absent in early Irish literature, but Waddell (2014: 36) has recently drawn attention to the finale of *Táin Bó Cúailnge* where the dismembered parts of the bull of Cooley are used to create features of the Irish landscape. This suggests derivation from the Indo-European creation myth whose variants include the theme of dismemberment in naming or origin legends.

Crucial to understanding how the birth of the sun and solar journey were conceived is the trope of 'Father Heaven' and 'Mother Earth' emerging from a primordial sexual union, a theme present in most Eurasian creation myths (Leeming, 2010; Witzel, 2012: 128-129). The close relationship between this creation myth and the daily and yearly solar cycles is outlined in Egyptian mythology of the 3rd millennium BC and its associated iconographic representation (Figure 5.1; see Hassan, 1998: 98; Hart, 2005: 58, 110, 113, 147; Haggag, 2013: 24; Kramer, 2010: 31 for overview of the mythology and iconography). In Egyptian mythology the goddess Nut's body is the sky over which the sun barge sails on its daily journey and during its yearly journey she ingests the sun in the west at the spring equinox and gives birth to it in the east at the winter solstice. Both solar cycles allude to the creation myth as they reference the union of the sky (Nut) and earth (Geb) which resulted in the birth of the stars, deities (Isis, Osiris, Seth and Nephthys), etc. (Maravelia, 2003: 55-56; Hart, 2005: 110; Kramer, 2010: 33; Haggag, 2013: 24), thus reconciling 'linear time' and 'cyclic eternity' (days, months and years), with the creation events of the mythic past, which took place in undefined 'mythic time', and 'infinite absolute eternity' (Wente, 1982 ; Jørgensen, 2011).

Egyptian mythology depicts a night-time version of the Heaven and Earth myth where it is the female sky that covers the male earth, another trope which may ultimately be of Eurasian origin (Witzel, 2012: 131, 346). The same idea is clearly observable in Vedic myth (*ibid*.: 72, 130-131) and it may be argued that the concept is evident within other Indo-European mythologies where the male sun-god travels across the sky during the day (unaided or is escorted by his daughter) but the female sun/daughter of the sun-god either makes the nocturnal journey or is freed between sunset and sunrise.

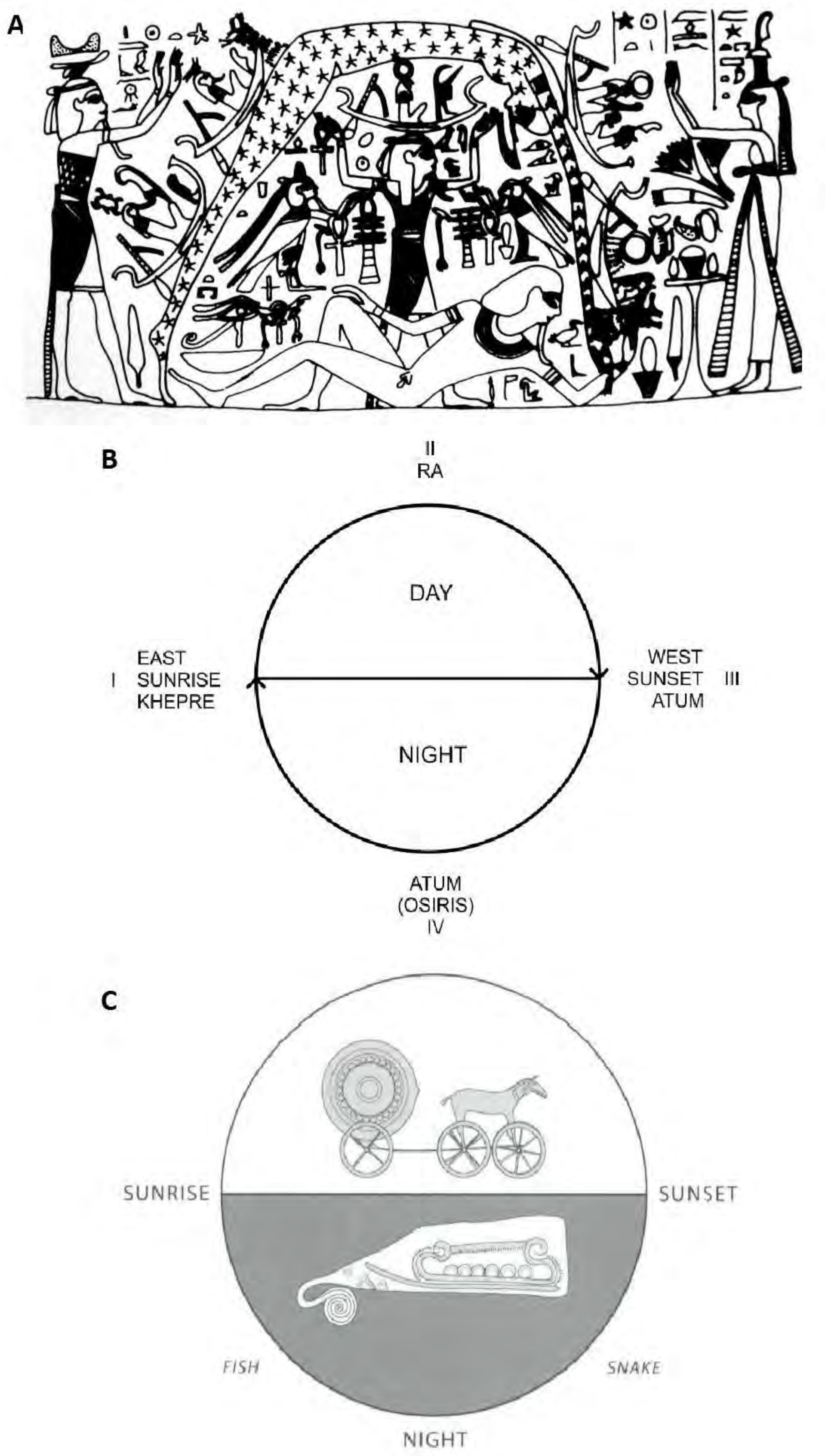


Figure 5.1: Conceptions of the solar journey in Egypt and Scandinavia. (A) The mythology of Nut and Ra as depicted on the Coffin of Imen-m-per-Mut (Kramer, 2010: Fig. 6.); (B) The solar cycle as viewed by the Egyptians (Kramer, 2010: Fig. 3.); (C) The daily solar journey as depicted on Scandinavian bronze razors showing different points of the cyclical movement of the sun. Summary of the cosmological scheme proposed by Kaul (Bradley, 2006: Fig. 2.)

The daily and yearly solar journeys were not only regarded as symbolic re-enactments of creation and the cyclical re-birth of the sun, but were also understood in terms of (a) the birth of a child, and (b) the life-cycle (Van Dijk, 1995: 1706; Maravelia, 2003: 63-68). The sun's daily course is described in terms of the life-cycle. Each morning the Atum or sun-god Ra/Horus is the newly born child emerging from the womb of the sky goddess Nut on the eastern horizon and at noon he reaches the peak of his might and power. In the evening he becomes an old man in decline before his final death as he sets beyond the western horizon and enters the underworld. When Ra/Horus enters the underworld he becomes the Atum/Osiris and returns to the 'primeval waters' of Nut's body, along which he voyages during the course of the night. Shortly before dawn, Ra/Horus slays the snake Apophis and is reborn once again (Van Dijk, 1995: 1706; Renggli, 2002: 2-3; Maravelia, 2003: 63-68; Jørgensen, 2011: 72-76).

The iconography of the solar journeys and the sun's cyclical raising from, and lowering into, the underworld also alludes to an individual passing into the afterlife. During the New Kingdom (beginning c. 1550 BC) the myths of Osiris and Ra were linked. During this period when Ra entered the underworld at sunset he "became" Osiris. In the middle of the night Ra encounters Osiris' body, motionless and seemingly dead, but they embrace and become one. Through this union Osiris is revived by the rays of Ra and becomes the sun-god's nocturnal embodiment. At the same time Ra, who had "died" and entered the realm of the dead, is imbued with the life-force of Osiris and becomes "Horus in the arms of his father Osiris" who is lifted out of the waters to be reborn Ra-Harakhty "Ra-Horus of the Horizon" (Van Dijk, 1995: 1706). The Egyptians considered death as a transition or birth to a different mode of being, eternal life in the underworld (Van Dijk, 1995: 1706; Maravelia, 2003: 56-58, 68; Kramer, 2010: 33). This idea also resonates with a baby's experience of birth as a 'death experience', as it possible to drown at that moment if the umbilical cord is not cut (Renggli, 2002: 15). Throughout the 4th millennium BC in early Pre-dynastic Egypt, tombs were conceived of as maternal womb, and the deceased were buried in foetal positions in an oval pit with food and water, positioned for rebirth (Hassan, 1998: 107-108).

5.3.1 Solar Motifs

A 'seal' tradition associated with a repertoire of motifs which included (among others) concentric circles, clockwise spirals and wheel-crosses (Figure 5.2) was established in Turkey during the 6th millennium BC. This tradition and its associated decorative elements spread rapidly across South-Eastern and into Central Europe (Budja, 2003; Becker, 2007; Skeates, 2007: 185) and possibly reached northern areas (Núñez, 1986). These motifs, which are associated with solar symbolism, first appeared at Çatalhöyük and Bademagaci (c. 7500-5700 BC), predating those found on the seals from the Balkans, Carpathian Basin and elsewhere (Budja, 2003: 123, 2005: 65). Similar

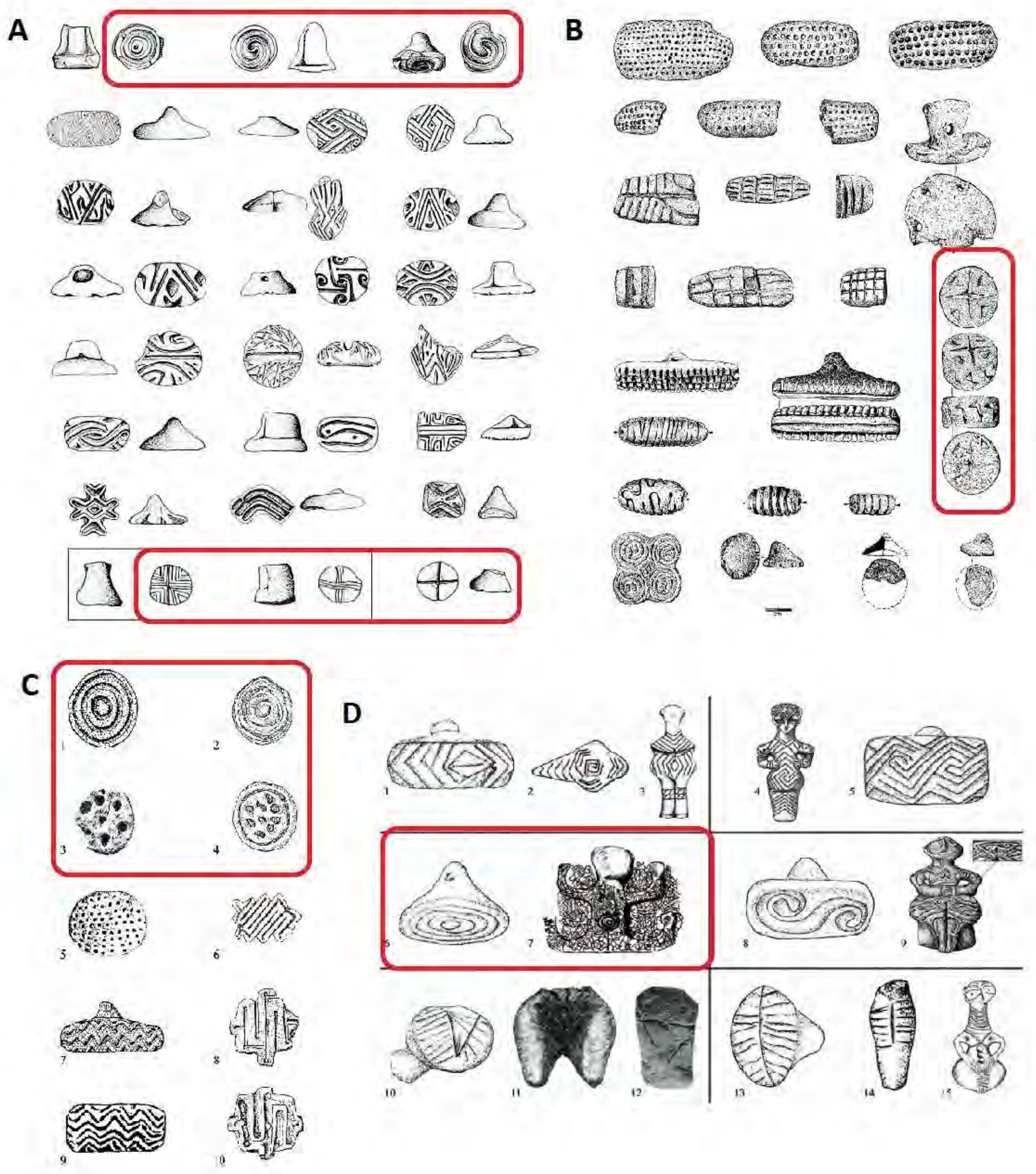


Figure 5.2: Selection of Early Neolithic seals/stamps with examples featuring possible solar symbols highlighted. Çatalhöyük "seals" assemblage (Budja, 2003: Fig. 2.); (B) Stamps from Caverna delle Arene Candide, northwest Italy (Skeates, 2007: Fig. 1.); (C) Stamps from Greece. 1, 5, 9: Nea Nikomedeia; 3, 7: Sesklo; 2, 4: Achilleion; 6: Philia; 10: Pyrasos (Naumov, 2008: Fig. 5.); Visual similarities between patterns on stamps and figurines. 1: Stenće; Gorobinci; 2-3: Balčik; 4: Potporanj; 5: Ustie na Drim; 6: Porodin; 7: Çatalhöyük; 8: Mala Tumba-Trn; 9: Pazardjik; 10: Golema Tumba-Trn; 11: Čaška; 12: Golema Tumba-Trn; 13: Veluška Tumba; 14: Yablona; 15: Nudra (Naumov, 2008: Fig. 11.)

decorative motifs (Figure 5.2) appear on contemporary ceramic vessels, figurines ('idols') and 'altars', indicating their symbolic importance (Skeates, 2007: 185-186; Naumov, 2008: 193-194). These solar symbols feature on pottery in southeast Europe from at least the 6th millennium BC and throughout the 5th and 4th millennia BC (Gimbutas, 1974: 91-103). These symbols, particularly wheel-crosses, are frequently associated with female figures, possibly articulating aspects of the

Father Heaven/Mother Earth narrative. For instance, vase decoration compositions frequently featured hourglass-shaped ‘goddesses’, spirals and wheel-crosses within the Cucuteni (Tripolye) culture (c. 4500-3000 BC) (Gimbutas, 2001: 39-40). The polypod-bowl form (c. 4000-3600 BC) which originated in the Pontic steppe region spread throughout the Carpathian Basin and into areas of southern Germany and featured motifs including concentric circles, wheel-crosses and five-pointed stars (Sherratt, 1997: 411). In the Carpathian Basin (c. 3700/3500-2800 BC) wheel-crosses, concentric circles and spirals are prominent symbols on other ceramic forms, such as the ‘Bratislava-type’ bowls (Bondár, 2002).

Rayed motifs, and to a lesser extent concentric circles and spirals were a feature of Neolithic-EBA Alpine rock art (c. 5500/5000-2200/1800 BC), most notably on the ‘statue-stelae’ at Valcamonica (Lombardy) northern Italy, during the 3rd millennium BC (Van Hoek, 2001: 87-110, 164-165, 208-211; Frachetti and Chippindale, 2002: 125-129, 132; de Saulieu, 2004, 2007; Fossati, 2007: 139, 141, 143-144; Anati, 2008: 17, 19-22, 26-27, 29, 2009: 943-944, 948, 955; Kaul, 2013a: 267). In Western Europe rayed motifs occur on Iberian ceramics from the Early Neolithic through to the Bronze Age (c. 5600/5500-2000/1800 BC), including among the repertoire of motifs found on Beaker pottery with ‘symbolic’ decoration (Salmerón Juan and Teruel Juliá, 1990: 146; Garrido Peña, and Kenia Muñoz López-Astilleros, 2000: 287-291, 293-294; Guerrero Ayuso, 2010: 33-36; Collado Giraldo and García Arranz, 2013: 295, 297; Hernández Pérez, 2014: 147). This form of motif also occurs in a number of megalithic tombs (c. 4200/4000-3000/2700 BC) in north-western Spain and Portugal (Shee Twohig, 1981: 28-29) and in the repertoire of “schematic art” (c. 3500/3200-2700/2500 BC). In addition ‘phi-like’ anthropomorphic figures may incorporate circular motifs and other ‘idol’ figures with possible ‘rayed headdresses’ also occur in the south-eastern tradition (Gómez-Barrera, 2005: 29, 32-36, 49-50; Wintcher, 2011: 180-184; Collado Giraldo and García Arranz, 2013: 295, 297; Hernández Pérez, 2014: 147-148). Cup marks and circular motifs, including concentric designs and spirals, occur in megalithic tombs (c. 4200/4000-2700 BC) across Iberia and the Catalonian area of southern France (Shee Twohig, 1981: 29; Bueno Ramírez and de Balbín Behrmann, 2003: 413-427; Bueno Ramírez, et al., 2007: 612-613, 2009: 889, 912, 917, 2014: 11-12). In the rock art tradition of the Galician area (c. 4000/3500-2000/1800 BC) of north-west Iberia various circular motifs occur, including cup-marks and concentric circles (Bradley, et al., 1995; Bradley and Fábregas Valcarce, 1998; Van Hoek, 2001: 72-86, 163-164, 197-208; Kaul, 2013a: 267). Circular motifs are rare in the repertoire of megalithic art in Brittany, but examples occur including concentric circles at the Table de Marchands (C4ii), Kermorvan and Kerpenhir and spirals at Gavrinis (Shee Twohig, 1981: 53, 63-64; Le Roux, 1992: 98) and cup marks on the menhirs at Kermaillard (Sarzeau) and La Tremblais (St-Samson-sur-Rance) (Le Quellec, 2006: 691, 693-694).

The Iberian ocular (oculados) design (c. 3500-2750/2500 BC), featuring paired often ‘rayed’ circular motifs, occurred in variety of manifestations and media. In southern areas these included an array of ‘idol’ forms, including approximately cylindrical objects of limestone, marble, bone and ivory (Salmerón Juan and Teruel Juliá, 1990: 144-145; García Atiénzar, 2004: 227-230; Hurtado, 2008, 4-6, 2010: 139-144, 153, 157-160, 163) and roughly trapezoidal plaques of schist and slate (Salmerón Juan and Teruel Juliá, 1990: 145; Lillios, 2002: 141, 2004: 129, 131, 136-137; Hurtado, 2008: 3; Thomas, et al., 2009: 54; Bueno Ramírez, 2010: 47-52; García Rivero and O’Brien, 2014: Table 1) and naturalistic "anthropomorphic human figurines" (Hurtado, 2008: 6-8, 2010: 172-181). Rare instances of this decoration on gold foil, at least one of wich was attached to a cylindrical ‘idol’, have also been documented (Hurtado, 2010: 149, 151). All of these ‘idol’ forms display regional typologies, have their largest concentrations in the south-west, but also occur in the south-east. In the latter area representations are also found in the painted “schematic” rock art style repertoire (Salmerón Juan and Teruel Juliá, 1990 143-144; García Atiénzar, 2004: 226-230; Gómez-Barrera, 2005: 29-36; Wintcher, 2011: 28, 31, 57, 180-184; Hernández Pérez, 2014: 148) and the motif also occurs on ceramics across Iberia including the north-west and southern regions (Salmerón Juan and Teruel Juliá, 1990: 145; Rodríguez Casal, 2003: 27-28). Elsewhere the ocular-motif occurs on such artefacts as an Iberian-type cylinder ‘idol’ of local marble from Montmaurin (Haute Garonne), south-east France (Hurtado, 2010: 163) and the chalk “drums” from an adolescent's grave at Folkton (Yorkshire) in north-east England (Longworth, 1999; Sheridan, 2012: 41).

In Irish megalithic art (3500/3350-2900/2800 BC) circular and rayed motifs as a group are relatively common, although the former category is significantly more ubiquitous. It includes variant forms of single and concentric circle, and spiral, which itself encompasses a variety of single, double and triple forms (Figure 5.3; Robin, 2009: 69-71). Significant morphological variation is also apparent among the rayed motifs, which fall into two basic categories, one being circular the other semi-circular (*ibid*.: 72-74). As shall be expanded upon below, the ‘compositional’ association of spiral variants with ‘naturalistic’ tree-like ‘ramiform/arboriform’ symbols (Figure 5.20) at Newgrange (k4, k51; in the case of the latter a serpentiform also occurs) (Robin and Cassen, 2009: 855; Robin, 2012: 144) are particularly notable from a cosmological perspective and associated connotations may have been connected with the motif combinations Robin (2009: 129, 133) described as “spiral, chevrons and lozenge”, “spiral(s) over chevrons”,

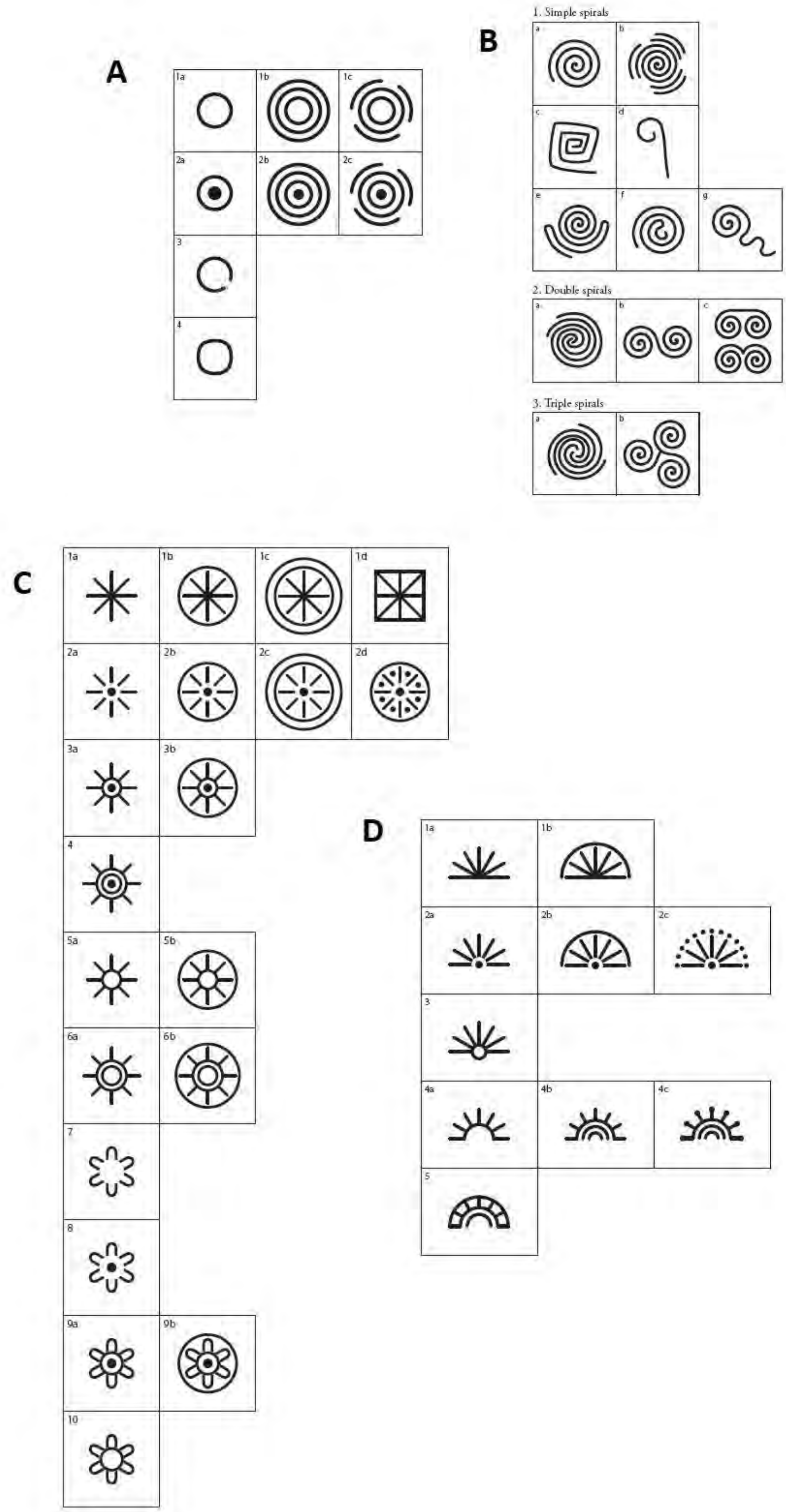


Figure 5.3: Circular and rayed symbols in Irish megalithic art. (A) Typological table of the circular symbols (Robin, 2009: Fig. 25.); Typological table of the spiral symbols (Robin, 2009: Fig. 26.); Typological table of the radiate circular symbols (Robin, 2009: Fig. 29.); Typological table of the radiate semi-circular symbols (Robin, 2009: Fig. 30.)

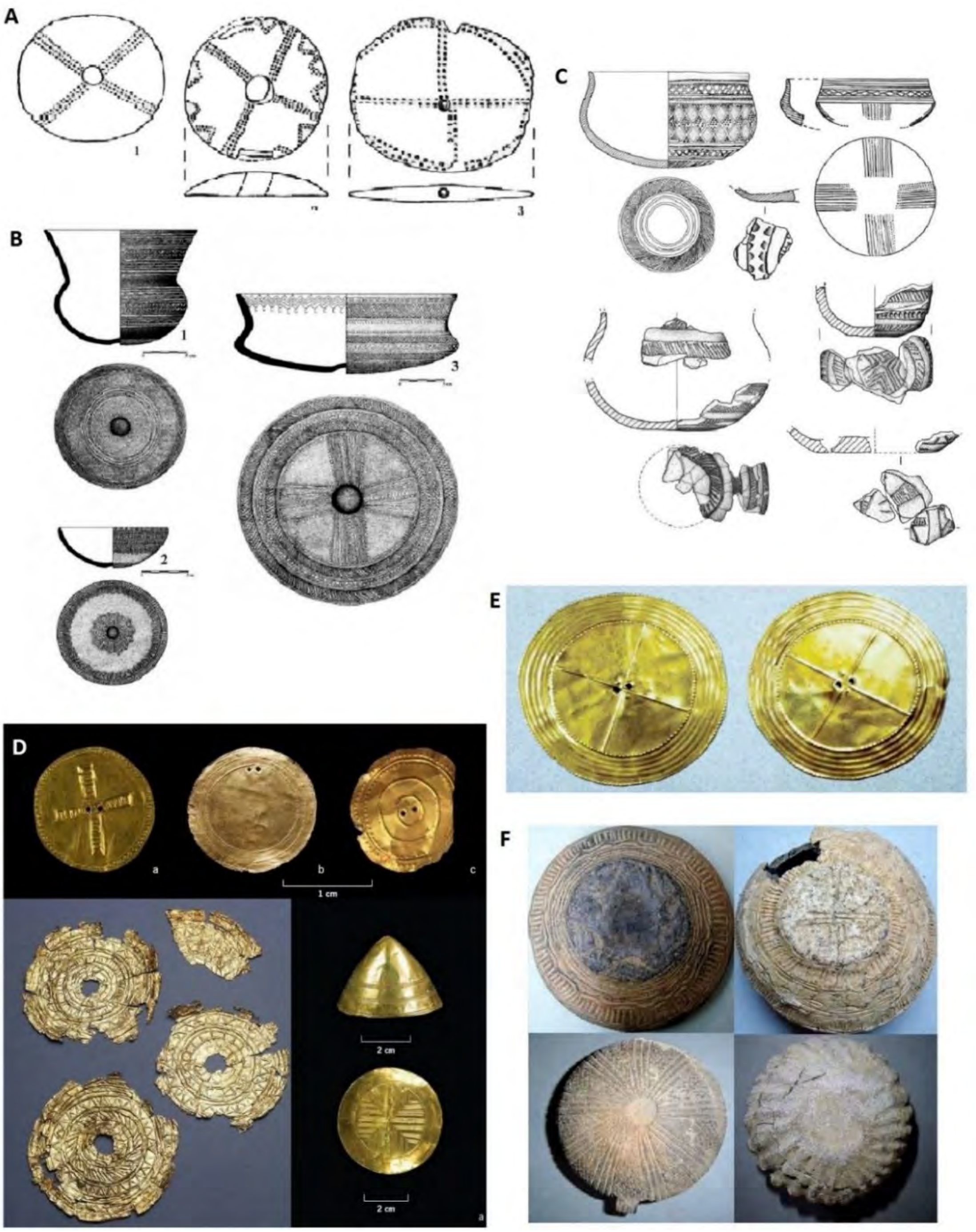


Figure 5.4: Selection of Chalcolithic-EBA material featuring possible solar symbolism. (A) Typology of amber discs in the Globular Amphora culture (Czebreszuk, 2003b: Fig. 4.); (B) Beaker vessels with basal decoration from the Ciempozuelos cemetery (Madrid, Spain) (Garrido Pena, 2006: Fig.7.2.); Beaker vessels with basal decoration (no scale) from Ambrosetti, Fontino Cave, Bulimacco and Fosso Conicchio, northern Italy (adapted from Leonini and Sarti, 2008a: Figs. 3-4, 2008b: Figs. 3-4); (C) Pair of gold discs from Oviedo, Spain (Cahill, 2015: Plate 8.); (D) Top: Early styles of golds disc from the British Isles. (a) Cross-in-circle, Mere, Wiltshire; (b) Concentric dot circles, Kirk Andreas, ilse of Man; (c) Concentric lines and dots, Banc Ty n-ddol, Ceredigion (Needham and Sheridan, 2014: Fig. 5.a-c.); Bottom Left: Circular plaque covers (aggrandised buttons) from a grave at the Knowes of Trotty, Orkney (Needham and Sheridan, 2014: Fig. 15.); Bottom Right: conical pendant/button from Upton Lovell G2e, Wiltshire (Needham and Sheridan, 2014: 18a.); (E) Irish Food Vessel Bowls and Miniature Vessels with basal decoration (no scale). Top Left: Kiltalown, Co. Dublin; Top Right: Donaghanie, Co. Tyrone; Bottom Left: Dunleckney, Co. Carlow; Bottom Right: Moyhora, Co. Kilkenny (Cahill, 2015: Plates 5, 10)

"meandering sign/serpentiform and circular sign", and "scalariform/ramiform sign with axial circle". Cup-marks, concentric circles and a number of more complex variant motifs are a prominent feature of rock art (potentially beginning c. 3800/3600-3200 BC) in the British Isles (Van Hoek, 1990, 1993, 2001: 8-71, 159-162, 172-180; Johnston, 1993; O'Sullivan and Sheehan, 1993; Corlett, 1998a, 1999, 2014; Waddington, 1998, 2007; Beckensall, 2002; O'Connor, 2006; Kaul, 2013a: 266; Aroon Enlander, 2015), but comprehensive consideration of this tradition is outside the scope of the current study.

In Central/Eastern Europe wheel-crosses and 'star-motifs' occurred on amber discs and v-perforated buttons (Figure 5.4) within the Globular Amphora and Zlota Cultures (c. 3250-2200 BC) in Central and Eastern Europe (Czebreszuk, 2003b; Szmyt, 2010: 131-135). These appear to be the inspiration for similar items which occur within the Beaker complex (c. 2600-2200/1800 BC) in the British Isles and both Western and Central Europe (Figure 5.4). In addition to gold discs, which do occur in pairs (Eogan, 1994: 19-21, 29-30; O'Brien, 2012: 219; Needham and Sheridan, 2014: 908, 917-918; Cahill, 2015: 26-27, 29-30), a minority of the Beaker-associated v-perforated buttons (Harbison, 1976; Shepherd, 2009; Needham and Sheridan, 2014: 915-917; Cahill, 2015: 29) are decorated with wheel-cross or concentric circle motifs (Figure 5.4). Star shaped faience beads with four/five points (c. 2100/2000-1600/1500 BC) have been recorded in Hungary and in Britain (mainly in northern regions) (Magee, 1993; Sheridan and Shortland, 2004). Basal decoration in the form of wheel-crosses or concentric circles has been recorded on Beaker pottery (Figure 5.4) in Britain Iberia, Italy and Hungary (Endrődi and Pásztor, 2006; Leonini and Sarti 2008a, 2008b; Leonini, et al., 2008; Poggiani Keller and Baioni, 2008; Cahill, 2015: 29-30). In Ireland (and Britain) the same range of motifs and "star-like" variants occur on the bases of a significant proportion of food vessel bowls (Figure 5.4), as well as occasional vases and accessory cups (Kavanagh, 1977; Ó Ríordáin and Waddell, 1993; Brindley, 2007; Cahill, 2015: 28-30).

Disc-shaped pendants with wheel-cross shaped decoration (c. 2000-1500 BC) occur in the Carpathian Basin (Figure 5.5) and North European (Guba and Szeverenyi, 2007: 94-95; David, 2010: 451-453). In the former area basal decoration in the form of concentric circles, spirals, wheel-crosses and star motifs occurs on fine ware ceramic vessels (c. 1700/1600-1500/1450 BC) (Figure 5.5; Guba and Szeverenyi, 2007: 95; Sofaer, 2013: 361-362, 364; David, 2003a: 38, 2010: 476-477). Wheel-cross designs occur on bronze disc- and racquet-headed pins of the Central-Eastern European Unẽtician (Aunjetitz) culture (c. 2000-1700 BC), particularly in Bohemia and Slovakia (Eogan, 1994: 30; Guba and Szeverenyi, 2007: 94; David, 2010: 473-476). These pin forms became widespread (c. 1600-1300 BC) with their main distribution area being the Upper Rhine Valley (Germany, France, and Switzerland), the Rhine-Main area (Germany) and western Bohemia

(Czech Republic) and the eastern-most specimens occurring in Poland. Certain variants remained in use within this distribution during in the Urnfield Period (c. 1300-800 BC) (Guba and Szeverenyi, 2007: 94; David, 2010: 473-476). The motif also features on identical bronze objects of uncertain function from Balkåkra, Sweden and Hasfalva, Hungary (c. 1700-1600 BC), which have been variously interpreted as drums or stools (Kristiansen and Larsson 2005; Pásztor, 2010; Fig 5; Sofaer, 2013: 361). Wheel-cross motifs (associated with various solar-related motifs including stylized boats, spirals and 'spiral volutes') also occur on gold discs (c. 1700-1500 BC) in the Carpathian Basin (Figure 5.5Figure 5.4; David, 2003a: 40-44, 2007, 2010: 453-456).

The Nebra disc (c. 1600 BC) from Saxony-Anhalt, Germany (Figure 5.10) depicts stars (including the Pleiades), the sun and the moon (Pásztor and Roslund, 2007: 271; Maraszek, et al., 2009: 50-56) and three urns from a cemetery at Békásmegyer, Hungary (c. 1600-1100 BC) contained small, clearly recognizable suns, moons and stars (Pásztor, 2011: 138). Star-shaped motifs appeared on the pommel discs of solid-hilted swords (Vollgriffschwerter) from Austria, Moravia and Hungary 451; Mödlinger, 2013: 68, 70). Wheel-crosses are frequent on sub-group of bronze greaves which have a wide but thin distribution across eastern parts of Europe and occur on bronze belt plates from the Carpatian Basin and Poland (Guba and Szeverenyi, 2007: 94). Decoration on the breastplates of Carpathian cuirasses (c. 1300-1100 BC) include examples featuring (sometimes paired) star-shaped motifs (Mödlinger, 2014: 21-22, 24-25). Star-motif decorated cap helmets (c. 1200-1000 BC) have a distinct concentration in Hungary but have a much wider distribution encompassing Germany to the north, Romania to the east, Austria to the west and Croatia to the south (Mödlinger, 2013: 73-74).

A variety of circular motifs occur in Bronze Age Scandinavian rock art (beginning c. 1700 BC) including cup-marks, simple circles, concentric circles and wheel-crosses (Kaul, 1998: 195-199, 2013; Van Hoek, 2001: 111-151, 182-196; Kristiansen, 2012: 74). The 'sun chariot' (c. 1500-1300 BC) recovered from a bog in Trundholm (Zealand), Denmark (Figure 5.22), depicts a horse pulling a sun-disc, both mounted on a rod that is carried by three pairs of four-spoked wheels and is believed to allude to both the 'day and night suns' (Kaul, 1998: 30-35; Goldhahn, 1999: 90; Kristiansen and Larsson, 2005: 294-296; Kristiansen, 2012: 74; Witzel, 2012: 287). In this context it may also be notable that a wheel-cross on an unprovenanced Danish amber disc mounted on a bronze handle becomes clearly visible when held up to the sun (Kaul 1998: 24-25; Kristiansen and Larsson, 2005: 302). Disc-shaped bronze belt plates with spiral-decoration (c. 1500-1300 BC) occur in female burials across Norway and in Denmark (Kristiansen and Larsson, 2005: 298; Engedal, 2010: 57-58, 295-298) and a series of conical gold hats (c. 1400-700 BC) from France, Switzerland and Germany feature a variety of 'astronomical' symbols, typically concentric circles and discs, in

Figure 5.5: Selection of Bronze Age material featuring possible solar symbolism. (A) Disc-headed bronze pins from Peigarten, Lower Austria (David, 2010: Abb. 37.); (B) Bowls from the Carpathian Basin with 'wheel motifs'. (a) Vatya bowl, Kelebia (Hungary); (b) Incrusted Pottery bowl, Királyszentistván (Hungary); (c) Füzesabony bowl, Golop (Hungary); (d) Gyulavarsánd bowl, Gyulavarsánd-Laposhalom (Romania) (Sofaer, 2013: Fig. 3.); (C) Schematic drawing of Central/Eastern European decorated bronze discs and the development of the star decoration c. 1200-1100 BC (Mödlinger and Piccardo, 2013: Fig. 3.); (D) Central/Eastern European swords (1–12) of different types and a butt-headed axe from Winklarn (13), all with the star decoration (no scale). 1: Absam/Hall (Austria); 2: Breitenbach (Austria); 3: Kirchberg am Wagram (Austria); 4: Greiner Strudel (Austria); 5 – Wörschach (Austria); 6 – Hinterriß (Austria); 7: Kforró (Hungary); 8: Stechow (Germany); 9: Tamási (Hungary); 10: Bingula-Divoš (Serbia); 11: Krasznokvajda (Hungary); 12: Strachotice (Czech Rep.); 13: Winklarn (Austria) (Mödlinger, 2013: Fig. 3.); (E) French type cuirass, unknown findspot (Mödlinger, 2014: Fig. 15.); (F) Gold hoard from Hammersdorf (Germany) (David, 2010: Abb. 11.)

their zonal decorative schemes. Ten-pointed stars feature atop specimens from western France (1600-1100 BC), as well as disc-headed axes from Central and Southern Europe (David, 2010: 448-and south-eastern Germany and wheel-crosses also occur on the Ezelsdorf-Buch specimen and possible stylised solar-boats on the Berlin example (Menghin, 1999; Springer, 1999; David, 2003a: 45-49).

Bronze open-work spoked wheel-cross shaped pendants (Radan-hänger) (c. 1500/1400-800/700 BC) had a wide distribution stretching from Denmark in the north to Italy in the south, and from France in the west to Bohemia and the Carpathian Basin in the east (Guba and Szeverenyi, 2007: 94; Giumlia-Mair, 2009: 158). Bronze discs (Figure 5.5) decorated with star-motifs and concentric circles (c. 1300-1100 BC) also had a relatively wide distribution in Central Europe with many being recovered from sites along the Danube, March, and Dyje rivers (Mödlinger, 2013: 71, 73; Mödlinger and Piccardo, 2013: 299-302). The star motif also appears across Moravia, Silesia and the western Carpathian area on the bases of fluted-neck pottery (c. 1300-1100 BC) and the later ceramic cups (1100/1000-900/700 BC). The ceramic cups subsequently spread eastwards to eastern Hungary and Transylvania (c. 1200/1150-750/700 BC), reaching as far as the Romanian coast and southern Poland (900-700 BC). Bronze cups from southern Scandinavia and northern Germany (c. 1100-900 BC), at least some of which were manufactured locally, were also decorated with the star motif (Mödlinger, 2013: 71, 74). Concentric circles, which most frequently paired on the breastplate, are a prominent feature of the decoration featured on French-type cuirasses (c. 1100-1000 BC) (Figure 5.5; Mödlinger, 2014: 22-23, 25-27). In Ireland, wheel-crosses occur on a composite bronze chain-link object (c. 1000-900 BC) believed to have been discovered in a former lake in Loughnaneane, Co. Roscommon (Waddell, 2014: 80). Eogan (2001: 234-238) suggests its closest parallels are among chain-link objects (c. 1300-800/700 BC) of the Hungarian-Slovakian-south German region of Central Europe, some of which feature avian and/or wheel-cross symbols. In the British Isles concentric circles, star-designs and wheel-crosses also occur on LBA disc-headed pins (c. 1200-500 BC) (Eogan, 1974).

5.4 Boats and the Suns Daily Journey

One aspect of the Egyptian iconography associated with Nut are depictions of the sun barge. Frequently barges sail on Nut's back, arms and legs, or are raised by Shu, who may himself be depicted as sailing in a boat (Figure 5.1). The crew of the barges is always different, but a figure representing the sun (-god) is always present (Kramer, 2010: 31). This imagery is strikingly similar to ancient Indo-European myths about the suns daily journey (Kristiansen and Larsson, 2005: 297, 306-308; Kristiansen, 2012: 72; Witzel, 2005, 2012: 139-143). These myths relate the disappearance of the sun/sun deity, in a cave or enclosure and its reappearance at/as dawn after the intervention of a group of gods (or others), creating or restoring light and prosperity to the world (Witzel, 2012: 139). As summarized by Kristiansen (2012: 72, and references), the myth involves the sun maiden and her brothers, the Divine or Heavenly Twins, who come to her aid in ships (or in the guise of horses). Here the sky god's bright daughter (the radiance of the sun itself) is chased in her chariot through the daylight sky by primeval monsters from the night and the netherworld (dragon, snakes or wolves). At sunset she is captured and taken into the waters of night. Her brothers (one divine and one mortal) come to ship her towards dawn, defeating or shackling the monster(s) until the morning when she and her sun-disc are released.

The classic form of the myth is found in the Indian Rig Veda. In this version, the early morning sun, the beautiful Uṣāḥ/Uṣas (Dawn) was hidden in a cave found on an island in the middle of the stream Rasā at the end of the world. The cave is opened by the combined efforts of either Índrah and his retinue, the Aṅgiras, or her twin brothers the Ashvins (Aśvínau), and the 'first dawn' emerges, illuminating the whole world. The basic outline of the myth is retained in all of the Indo-Iranian versions. The Sun is shut up in a cave, an underground fortress, or a house. A young hero finds its location, smashes the gate or enters the place of the sun's confinement by trickery, and releases it, along with some women, animals, and plants that make human life sustainable (Kristiansen and Larsson, 2005: 297; Witzel, 2005: 3-5, 40-42, 2012: 139-142).

In the Greek version Eōs (Roman Aurōra) (who may be represented by a sun-disc) drives the sun over the sky in a chariot drawn by white horses. At sunset she is captured and held prisoner, but her twin brothers the Dioskouroi (Diókoroi; sons of Zeús) come to her rescue (Kristiansen and Larsson, 2005: 297). Remnants of the Baltic version of the myth are preserved in the Latvian daina songs, where an evil character (Velns) captures the sun-god's daughter Saũle whose night-time eastwards journey under the earth takes place in a ship. During this journey she also dances on a rock in the middle of the sea, which corresponds to the island of the Indian version (Witzel, 2005: 44-45, 2012: 142-143). It has been suggested (Waddell, 2012: 346, 2014: 52-54) that in Irish literature allusions to the sun's nocturnal journey under the sea can be found in a 9th century AD text *In Tenga Bithnua* (The Evernew Tongue) and an early 12th century AD tale *Immram Úa Corra* (The Voyage of the Huí Corra).

5.4.1 Representations of Boats

The earliest depictions of 'crewed' ships in the Aegean/Mediterranean region, dated to the 6th millennium BC, are located near Gobustan, Azerbaijan (Figure 5.6) and solar-symbols appear in association with those on panels situated closest to the Caspian Sea (Vianello, 2008: 27-28). The earliest rock paintings in Finland (mainly eastern Lake Region and central areas), which are usually located on important topographic landmarks along waterways, may date to the early part of the 6th millennium BC, with the majority occurring c. 5100-3500 BC (Lahelma, 2005). The Finnish boats are 'crewed' and sometimes feature elk- head protomes (*ibid*.: 32). Early boat symbolism in Northern Europe also includes a small number of boat burials dating from between the later 6th and the 3rd millennium BC, including examples in Denmark (Grøn and Skaarup, 1991: 47-49; Skaarup, 1995: 51-53, 55-56; Mallon, et al., 2005: 18) and Sweden (Grøn and Skaarup, 1991: 49; Skaarup, 1995: 53-55). The Northern Fennoscandian rock art tradition (which is considered separately to the earliest Finnish tradition) is currently believed to have begun c. 4200 BC, with this earlier part of the tradition continuing until the earlier or mid-3rd millennium BC, and a second phase occurring c. 1700-1000/500 BC (Helskog, 1985; Shumkin, 1990; Bolin, 2000: 154-155; Bradley and Nimura, 2013: 14-15). Ships representations including craft with elk-head protomes have been recorded at such sites as Nämforsen, northern Sweden (Bolin, 2000; Helskog, 2004: 277-278) and Alta, northern Norway (Helskog, 1985, 1987, 2004: 273-277). Boat imagery also occurs around Lake Onega (Karelia) and the River Vyg on the White Sea in western Russia. Although the earliest carving may have emerged in the late-5th millennium BC, the majority of the images are believed to date to c. 3500/3200-2000/1500 BC (Stoljar, 2001: 93-102). Like the Finnish ships these representations usually feature elk-headed protomes and are frequently 'crewed', but many are 'empty' vessels (Poikalainen, 1999: 64). Around the White Sea, where the later boat-representations (c. 2500-2000/1500 BC) are more 'schematic', vessels engaged in 'hunting' are the most common motif (Savvateyev, 1994; Poikalainen, 1999: 64; Stoljar, 2001: 108, 118-120; Helskog, 2004: 278-282).

Cassen (2007, 2011) has built a convincing argument for the recognition of some crescent shaped figures as boats in the South Armorican (Morbihan) coastal zone of Brittany (Figure 5.6). These fall into two categories, (a) 'empty' boats and (b) boats with crews or passengers. Such depictions of boats occur on four stones (orthostats 2, 6, 16, 21) of the passage tomb at Mané Lud (Cassen, 2007: 225-227, 230-232, 2011: 14-15, 21-34). Two of these 'boat' representations occur alongside possible solar symbols. A 'rayed-motif' occurs above the 'boat' on orthostat 2, and the 'crewed' ship in the top left corner of orthostat 6 partially overlies, or is 'connected' to, a possible cup-mark defined circular symbol. 'Empty' crescent-shaped craft (again set within "compositions" that will be discussed below) occur on orthostat 10 in the Table des Marchands passage tomb (Cassen, 2007: 227, 232, 2011: 50-51) and orthostat 6 in Mané Rutual (Cassen, 2007: 226-227, 232) and further examples occur on menhirs at Kermaillard, Vieux Moulin (alignment), Kervazic (Cassen, 2007: 232, 2011: 41, 56-57) and a possible specimen at Bois-du-Duc (alignment) in Spézet

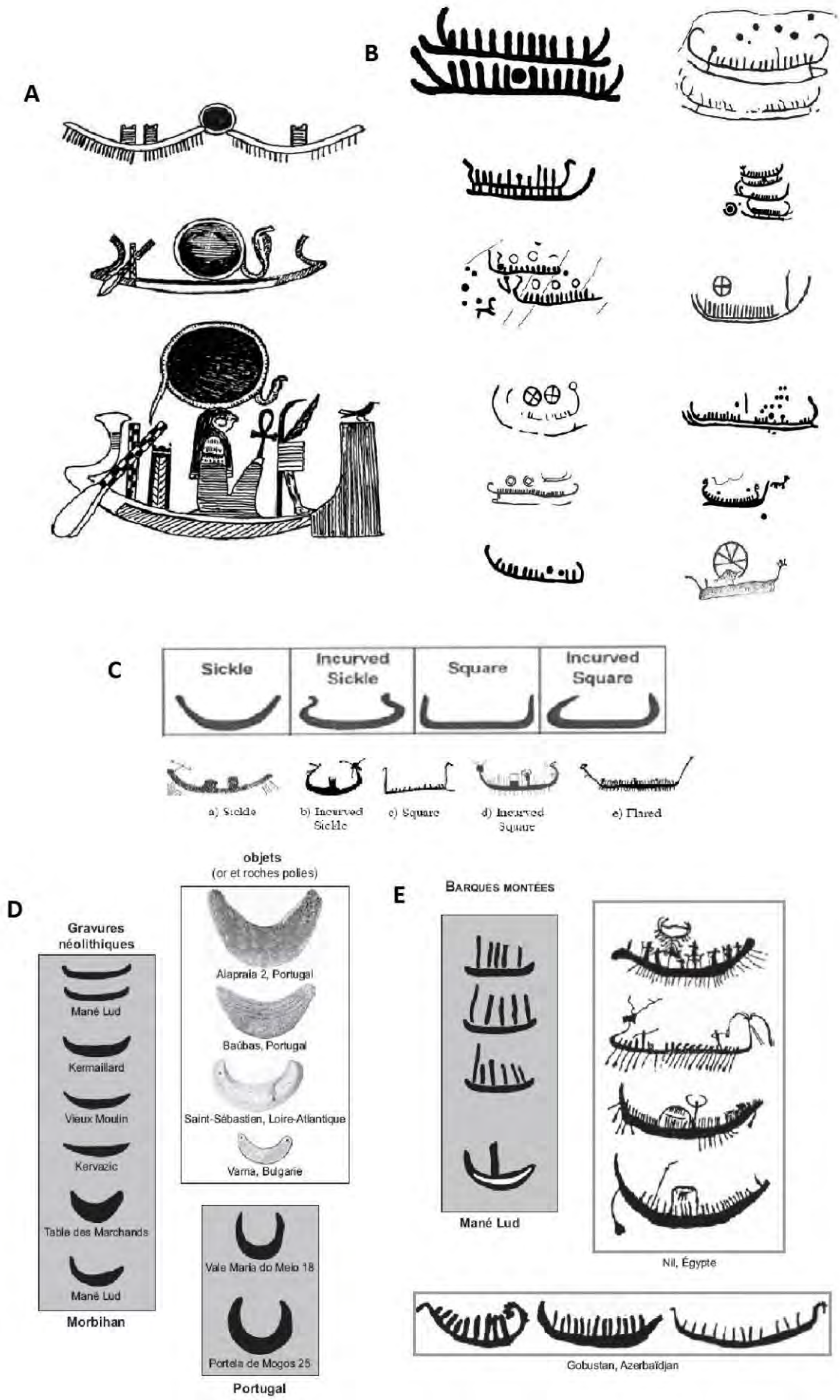


Figure 5.6: Selection of boat representations. (A) The change of Egyptian sun-boat depictions from the Pre-Dynastic to the Late Dynastic period (Kristiansen, 2012: Fig. 6.2); (B) Select examples of rock art scenes where the sun or suns are carried on a ship or on twin ships. The examples show both night ships (sailing from right to left) and day ships (sailing from left to right) (Kristiansen, 2012: Fig. 6.4.); (C) The five boat types depicted in Pre-Dynastic and Pharaonic era Rock-Art in Egypt's Central Eastern Desert (after Lankester, 2012: Fig. 1. And 6.1); (D) 'Empty' and 'crewed' ships in France (and Portugal) with comparisons from Egypt and Gobustan, Azerbaijan (adapted from Cassen, 2007: Figs. 8-9.)

(Finistère) (Le Quellec, 2006: 693, 702). In addition to these representations in megalithic art similar symbols occur on Auzay-Sandun 'Carn style' Breton ceramics (Le Roux 1992; Constantin, 2003; Le Quellec, 2006: 712; Cassen 2007: 233).

In Iberia a particularly 'naturalistic' painted boat occurs on the Neolithic (3625-3140 cal. BC) dolmen de Antelas (c9), Oliveira de Frades (Viseu) (Figure 5.9; Guerrero Ayuso, 2010; Vázquez Zabala, 2014). In addition, Cassen (2007: 233-234) has also suggested that 'empty' vessels may be depicted on the Vale Maria do Meio (orthostat 18) and Portela de Mogos (orthostat 25) megaliths in Évora where they appear as 'necklaces' (Figure 5.6). Similar interpretations can surely be advanced for comparable symbols on Vale Maria do Meio (orthostat 10) and Almendres (orthostat 56) (Bueno Ramírez, et al., 2005: 602, 617, Figs. 21, 22) and boat symbolism may also have been attached to the crescent-shaped 'idols' (c. 3500-2800/2700 BC) (Hurtado, 2008: 2) as advanced by Cassen (2007: Fig. 12).

The earliest crescent-shaped neck ornaments (Figure 5.10), which could have had similar symbolic associations, occur in Eastern Europe during the second half of the 5th millennium BC including gold specimens from graves 1 and 4 in the Varna I cemetery (4605/4550-4450 cal. BC) in Bulgaria (Cassen 2007: Fig. 12; Šikulová and Zápotocký, 2010: 415; Chapman, 2013: 309) and two boar tusk necklaces (one adorned with copper beads) from a Cucuteni-Trypilli (c. 4500-4000 BC) grave in Giurgiulesti in Moldova. In this context it is certainly feasible the later 4th or early 3rd millennium BC depictions of 'breast' and 'necklace' combinations (Figure 5.12) that occur on the anthropomorphic statue-menhirs at Le Câtel on Guernsey, Kermaillard, Kermené and Trévoux in Brittany, and on numerous examples in southern France and similar depictions in both Breton and Parisian gallery graves and a number of hypogée also located in the Paris Basin (Shee Twohig, 1981: 72-73, 80, 86; Lecomec, 1990; Peeters, 2005: 290, 299-301; Le Quellec, 2006: 699; Cassen, 2007: Fig. 12; Scarre, 2008: 81-87, 2009: 13-14) invoke boat and 'double sun' imagery. Lunula-type necklaces (Figure 5.10) are a feature of the contemporary anthropomorphic statue-menhirs at Sion (Valais) Switzerland (Harrison and Heyd, 2007: 158) and it is notable that a contemporary silver crescentic necklace (c. 3100-2500 BC) was discovered at Villafranca (Verona) in northern Italy and a copper specimen (c. 2700-2200 BC) was recovered at Dormettingen (Baden-Württemberg) in south-western Germany (Šikulová and Zápotocký, 2010: 415-416). In addition, possibly earlier (or contemporary) copper lunula-like crescent shaped necklaces have been discovered in Central Europe at Štramberk (c. 3500-3000 BC) in Moravia and in a grave at Velvar (c. 3100-2900 BC) in central Bohemia (*ibid*.: 412-413, 415-416). Furthermore, in Lombardy northern Italy within the Alpine Valcamonica region, large 'anthropomorphic' figures (c. 3500/3300-2500 BC) at Caven 3, Teglio (Valterllina) and Cornal 1, Tegli (Valterllina with possible

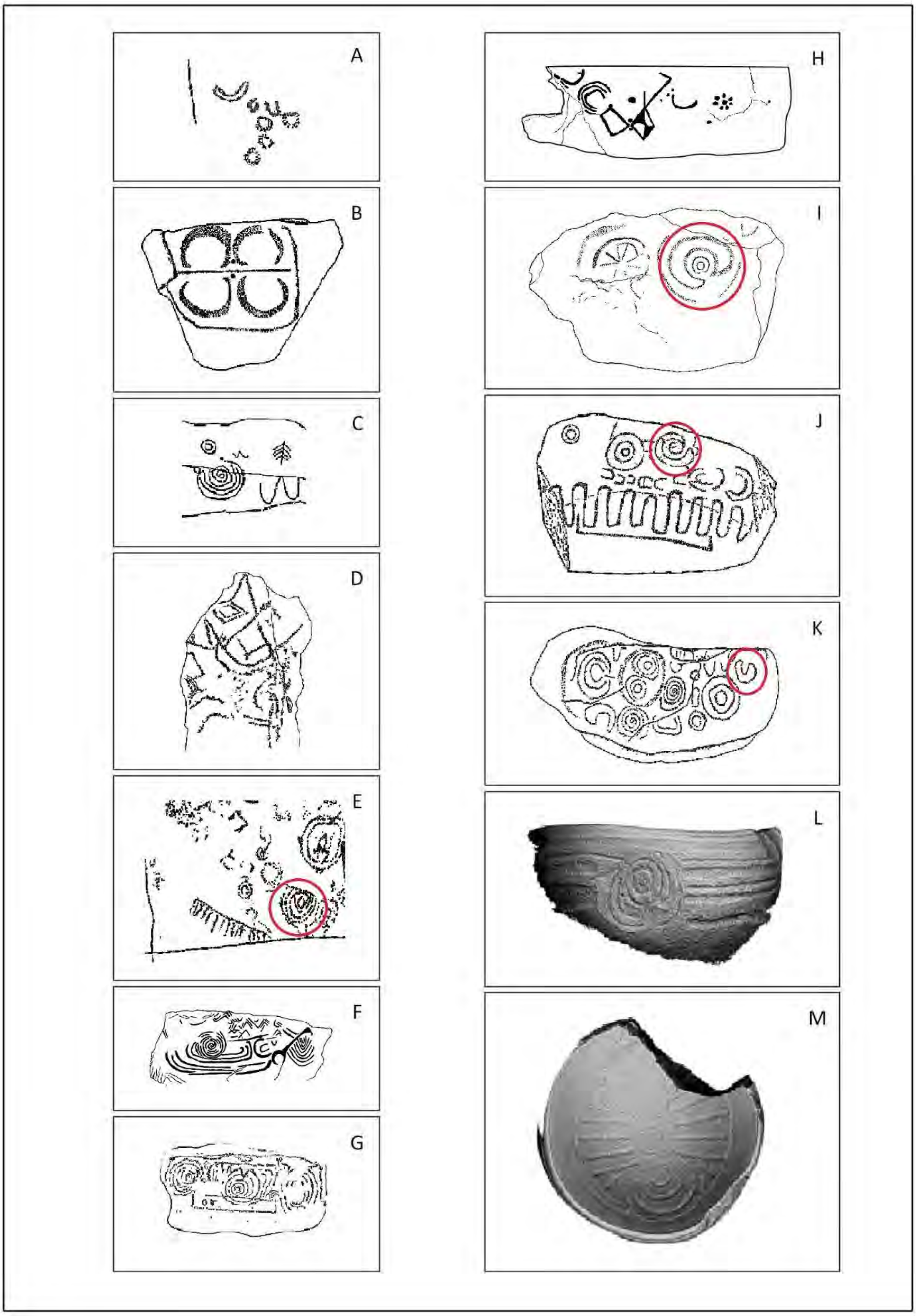


Figure 5.7: Possible 'empty' boats in Irish megalithic art. (A) Loughcrew Cairn U, c10; (B) Knowth 1,k86; (C) Newgrange 1, k51; (D) Fourknocks, c1; (E) Dowth North, c19; (F) Knowth 1, k12; (G) Knowth 1, k10; (H) Loughcrew (Cairn) O; (I) Knowth 1, k68; (J) (Knowth 1, k93 (K) Knowth 1, k79 (L) Knowth 1, basin eastern tomb, external; (M) Knowth 1,basin eastern tomb, internal (image by Angela Gallagher NUIG, adapted from images in Eogan, 1986 and Robin, 2009, with additions from The Discovery Programme: no date)

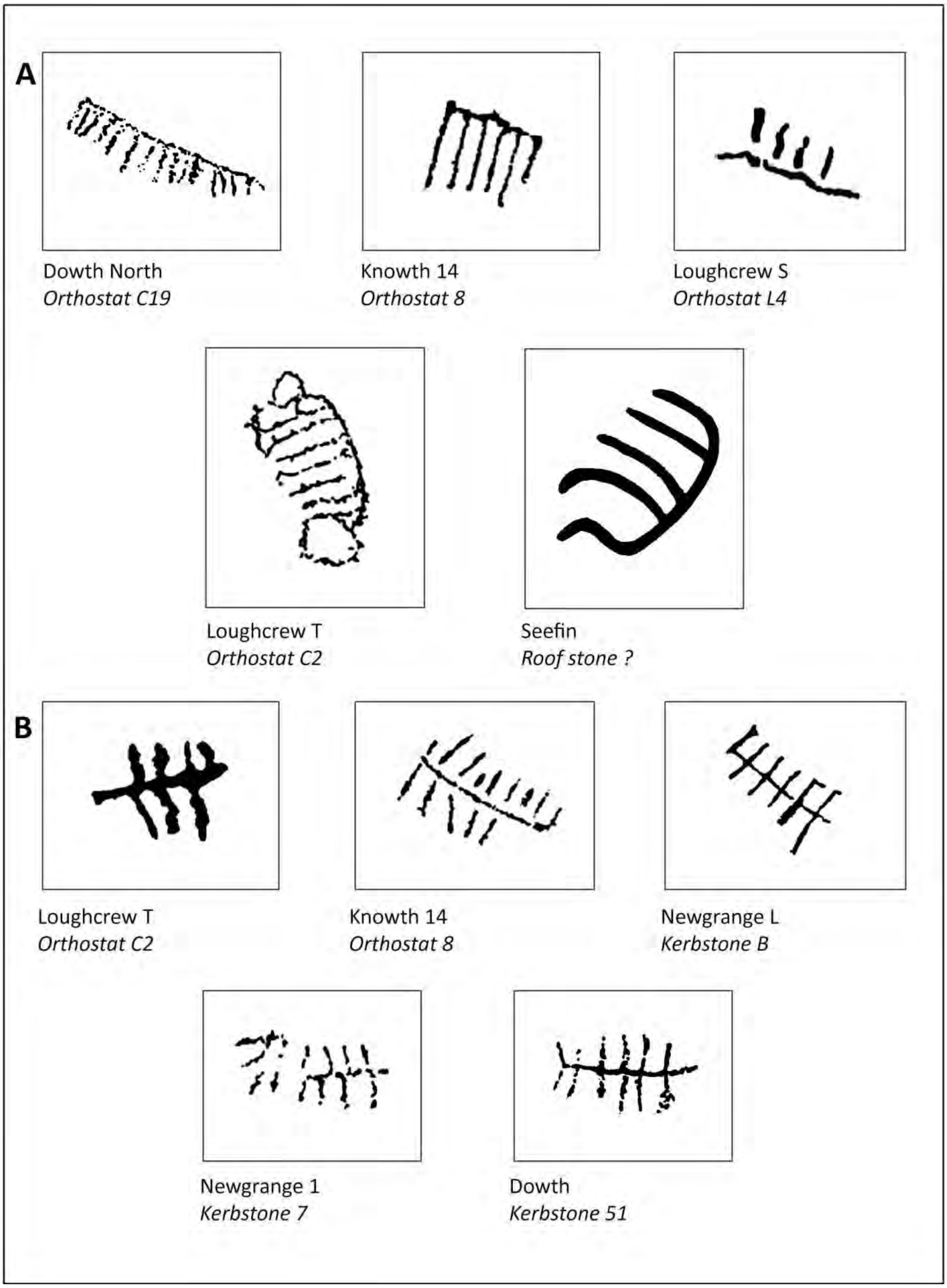


Figure 5.8 Possible 'crewed' and 'stylized' boat representations in Irish megalithic art (image by Angela Gallagher NUIG). (A) Possible 'crewed' boats in Ireland (adapted from Robin, 2009: Figs.. 5.3, 6.32, .6.6, 6.7, 2010: Fig. 16.), with addition of Seefin (bottom right) (Macalister, 1932: Fig. 3.); (B) Possible stylized boats in Ireland (adapted from Robin, 2009: Figs. 5.3, .6.6, 6.7 2010: Fig. 16)

'solar disk' heads, flanked by possible 'double suns' are situated above/in U-shaped symbols, reminiscent of 'necklaces' (Figure 5.12), which are suggestive of solar-boat iconography (Anati, 2008: , 17-29, 2009: 943-944, 948, Fig. 2).

The potential occurrence of boat symbolism in the Irish megalithic tradition has yet to be extensively explored, but, Hensey (2010: 242-244) recently suggested that particular 'basin' stones may have carried such connotations. In this context he highlighted the possibility that hide-covered boats or coracles were symbolised by both the ornate basin from the eastern passage at Knowth 1 and the slightly oval shaped upper basin from the east recess at Newgrange 1. In the latter instance he suggested that such a representation would be further emphasised if the lower basin were filled with water, as the upper one would appear floating on the water. With this proposition and the identification of boats in French megalithic art in mind, the question may be raised as to whether there are likely candidates for boat representations within the repertoire of Irish megalithic art. In short, the answer to this question is yes, there are numerous candidates at a number of sites. However, as the current author wishes remain cautious with regard to proposing the existence of boat-symbols, only those motifs which represent the most convincing contenders will be considered.

Possible Boat Symbols in Irish Megalithic Art			
Site	**"Empty" Boats**	**"Crewed" Boats**	**"Stylised" Boats (?)**
Newgrange 1	k51		k7
Newgrange site L			kB
Knowth 1	k10; k12; k68; k79; k86; k93; ornate basin in the eastern tomb (2 figures)		
Knowth 14		orthostat 8	orthostat 8
Dowth			k51
Dowth North	c19	c19	
Loughcrew (Cairn) O	Remaining stone		
Loughcrew Cairn S		orthostat L4	
Loughcrew Carin T			c2
Loughcrew Cairn U	c10	c2	
Fourknocks	c1		
Seefin		Roof stone	

Table 5.3: Possible boat symbols in Irish megalithic art

The most probable 'boats' are symbols which could represent 'empty' vessels, to use Cassen's terminology. The majority of these occur at Knowth 1, with further examples at Newgrange 1, Dowth North, Loughcrew Cairns O and U, and Fourknocks (Table 5.3). It may be advanced that the examples at the eastern entrance at Knowth 1 (k10, k12) which appear to 'carry' potential 'solar-spirals' represent a paired 'day-ship' (k10) and 'night-ship', and the paired and opposed motifs on k86 could represent a similar pairings. The motif on k68, which 'carries' a 'solar concentric-circle' may also be in an inverted 'night' arrangement, while both potential 'boats' on the coracle-shaped basin stone could both be in 'daytime' attitudes, although the internal example may be inverted. The motif on the outer face of the stone 'carries' a 'solar concentric-circle' and the inner motif a single 'solar-circle'. It is also feasible that a ship depicted in a 'daytime' attitude 'carries' a 'solar-spiral' on Newgrange 1 (k51). The motif in Fourknocks (c1) is similar to the example identified by Cassen (2007: 227, 232, 2011: 50-51) within the Table des Marchands in Brittany as it occurs below a quadrangle motif, and the Dowth North (c19) specimen may represent a more compact version of the Table des Marchands arrangement with the 'boat' occurring below a possible quadrangle and 'bow' (Figure 5.15).

The identification of credible 'crewed' craft, again using the terminology adopted by Cassen, within the repertoire of Irish megalithic art is even more difficult than advancing possible instances where 'empty' vessels may be depicted. As outlined in Table 5.3, there may only be five, or possibly six, motifs that could be seriously considered to represent 'crewed' boats. Of these the current author suggests the motif at Seefin (Wicklow) is perhaps the most overtly 'boat-like' and comparable to the 'crewed' vessels identified in France. However, as noted by Helskog (1985: 186) single-line boats (dating from the 5th- mid-3rd millennium BC) occur across northern Fennoscandia and if such craft were intended in Ireland those listed in Table 5.3 represent the most likely candidates. Similarly, if the argument that two motifs found on a Beaker bowl from tomb 15 at Los Millares in Spain are accepted as stylised boat representations (see below), then further Irish motifs (Table 5.3) could possibly be interpreted as 'stylised' boats.

Representations of boats became frequent around the Mediterranean and Aegean during 3rd and 2nd millennia BC. These include examples on petroglyphs at Folia in Greece, beginning c. 3000 BC. Boats associated with either fish or the solar-symbols occur on 'frying pans' (c. 2700-2400/2300 BC) and depictions appear occasionally on Mycenaean pottery (c. 2050/2000-1550 BC). Rock art representations (c. 1100-950 BC) also occur in the Aegean region, particularly on Cyprus at Tel Acco and Kition-Kathari and contemporary bronze (and copper) ship models occur on Sardinia (Vianello, 2008: 30).

Boat-shaped battle-axes are a characteristic feature of the Corded Ware complex of Northern, Central, and Eastern Europe which stretches from Scandinavia to the Alps, and from the Dutch coast to the Russian forest Steppe (Lõugas, et al., 2007: 22; Furholt, 2014: 1-5). The complex emerged c. 3200/3100-3000 BC or c. 2900 BC (Eriksson, et al., 2003; Kriiska, et al., 2007; Lõugas, et al., 2007; Włodarczak, 2009; Furholt, 2014: 6) most 'boat shaped' forms of battle-axe (Danish and northern German A2/3, and B2/3 types) date to c. 2900-2700 BC, with the supra-regional A1-type and other (B1, C, and D) regional variants emerging c. 2700 BC (Hübner, 2005; Furholt, 2014: 6-8). It appears that the A1 battle-axe developed in Jutland and became part of the supra-regional complex, but numerous local battle-axe types are commonplace throughout most of the 3rd

millennium BC (e.g. see Juodagalvis, 2002; Johanson, 2006: 107-108; Kriiska, et al., 2007; Lõugas, et al., 2007).

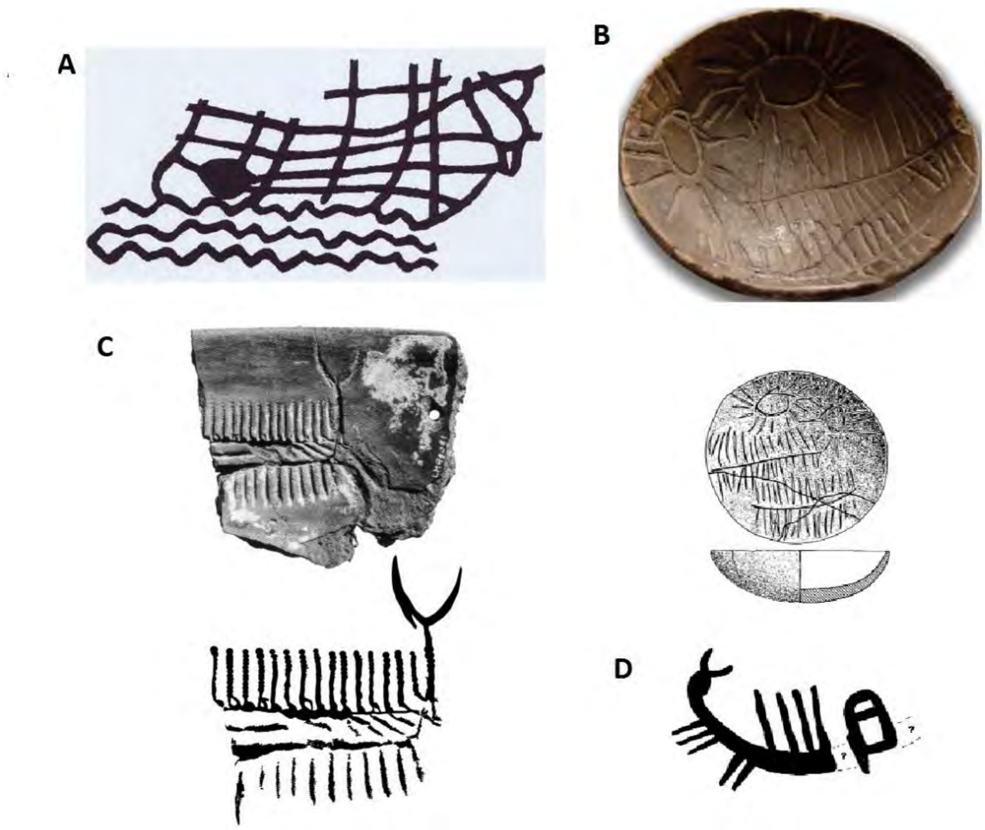


Figure 5.9: Iberian boat depictions. (A) Naturalistic boat depiction from the dolmen de Antelas (Viseu) (Vázquez Zabala, 2014: Fig. 1.); (B) Beaker ceramic dish from Los Millares (Almería) featuring decoration interpreted as a double sun and a pair of stylized boats (adapted from Cahill, 2015: Plate 7; Guerrero Ayuso, 2010: Fig. 5.); (C) partial boat representation featuring bucrania protome on Beaker sherd from Los Millares (Almería) (Guerrero Ayuso, 2010: Fig. 3.); Partial painted boat at Alisos, Las Zorrillas (Cádiz) (Guerrero Ayuso, 2010: Fig. 5.)

Boat-shaped battle-axes inspired by Late Corded Ware connections appeared in the British Isles during the second half of the 3rd millennium BC within the Beaker complex (Simpson, 1990, 1996; Needham, 2005) and burial with boats and within boat-shaped coffins occurs during the EBA (Figure 5.11), i.e. late 3rd and first half of the 2nd millennium BC (Elgee and Elgee, 1949; Watkins, 1980; Watkins, et al. 1982; Heal, 1986; Lawson 1986; Green, 1987; Cressey and Sheridan, 2003; Melton, et al., 2010), including an Irish example at Lissard, Co. Limerick (Ó Ríordáin, 1936: 173-175). A number of contemporary boat representations have been proposed to occur in Iberia (Figure 5.9). These include depictions on two ceramics from Los Millares, the first being two stylised boats deployed alongside a pair of 'rayed' solar-motifs on the interior of a Beaker bowl found in tomb 15, and a second more 'figurative' representation of a vessel featuring a bucrania endowed protome. The latter has been compared with a partially preserved painted figure at Alisos, Las Zorrillas (Cádiz) (Guerrero Ayuso, 2010).

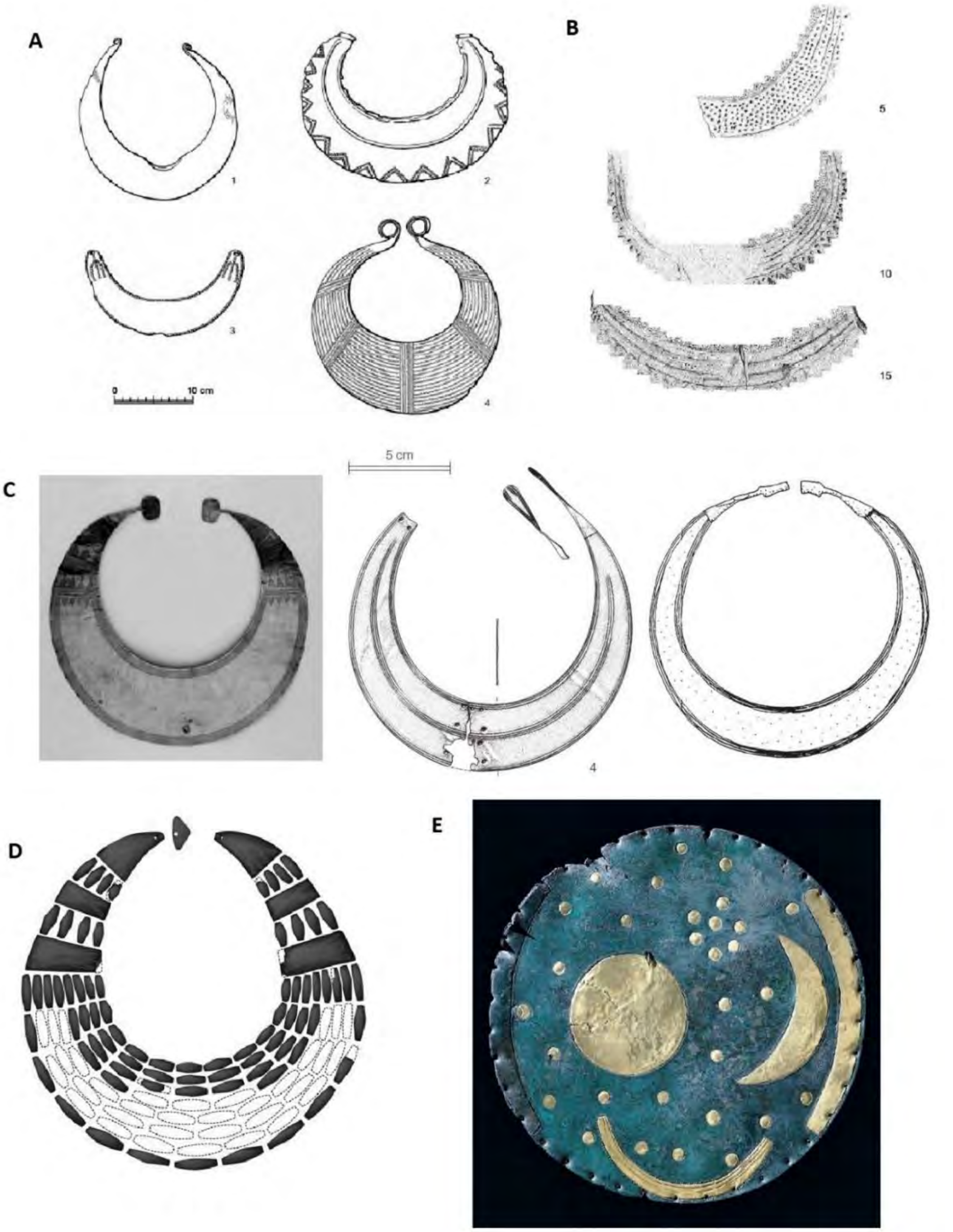


Figure 5.10: Lunula-type necklaces and the crescent-shaped boat on the Nebra Disc. (A) Early Chalcolithic crescent-shaped necklaces. 1: Štramberk-Kotouč (Czech Rep.); 2: Velvary, (Czech Rep.); 3 Villafranca (Italy); 4 Dormettingen (Germany) (Šikulová and Zápotocký, 2010: Abb. 8.); (B) Drawings of compound necklaces or lunulae on stelae at Sion (Switzerland) (Harrison and Heyd, 2007: Fig. 21.); (C) Gold lunula from Cornwall (England) (Frieman, 2012: Fig. 3.); Gold lunula from Denmark (adapted from Vandkilde, 2005: Fig. 10.); (D) Gold lunula from Malbork (Poland) (adapted from Makarowicz, 2003a: Fig. 5.); Crescentic jet necklace from East Kinwhirrie (Scotland) (Frieman, 2012: Fig. 4.); Bronze disc from Nebra (Germany) with symbols of the sun, moon, stars, horizons and solar boat (Cahill, 2015: Plate 11a.)

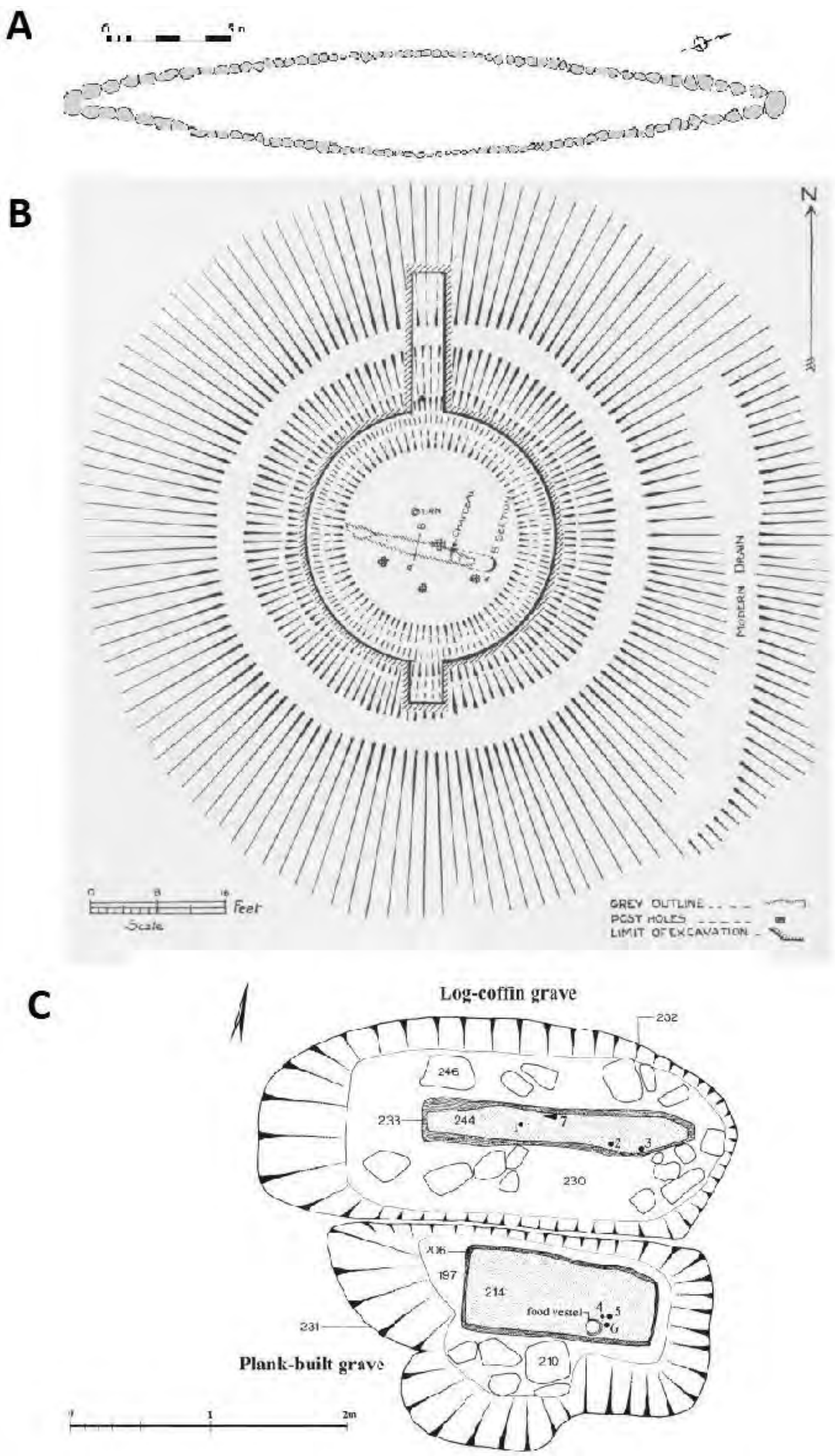


Figure 5.11: Selection of boats burials from Scandinavia and the British Isles. (A) Plan of ship setting on Götland (Sweden) (adapted from Bradley, et al., 2010: Figs. 2); (B) Plan of barrow with boat burial at Lissard (Ireland) (Ó Ríordáin, 1936: Fig. 1.); (C) Plan of the graves at Seafield West (Scotland) including grave with log-boat coffin (Cressey and Sheridan, 2003: Illustration 5.)

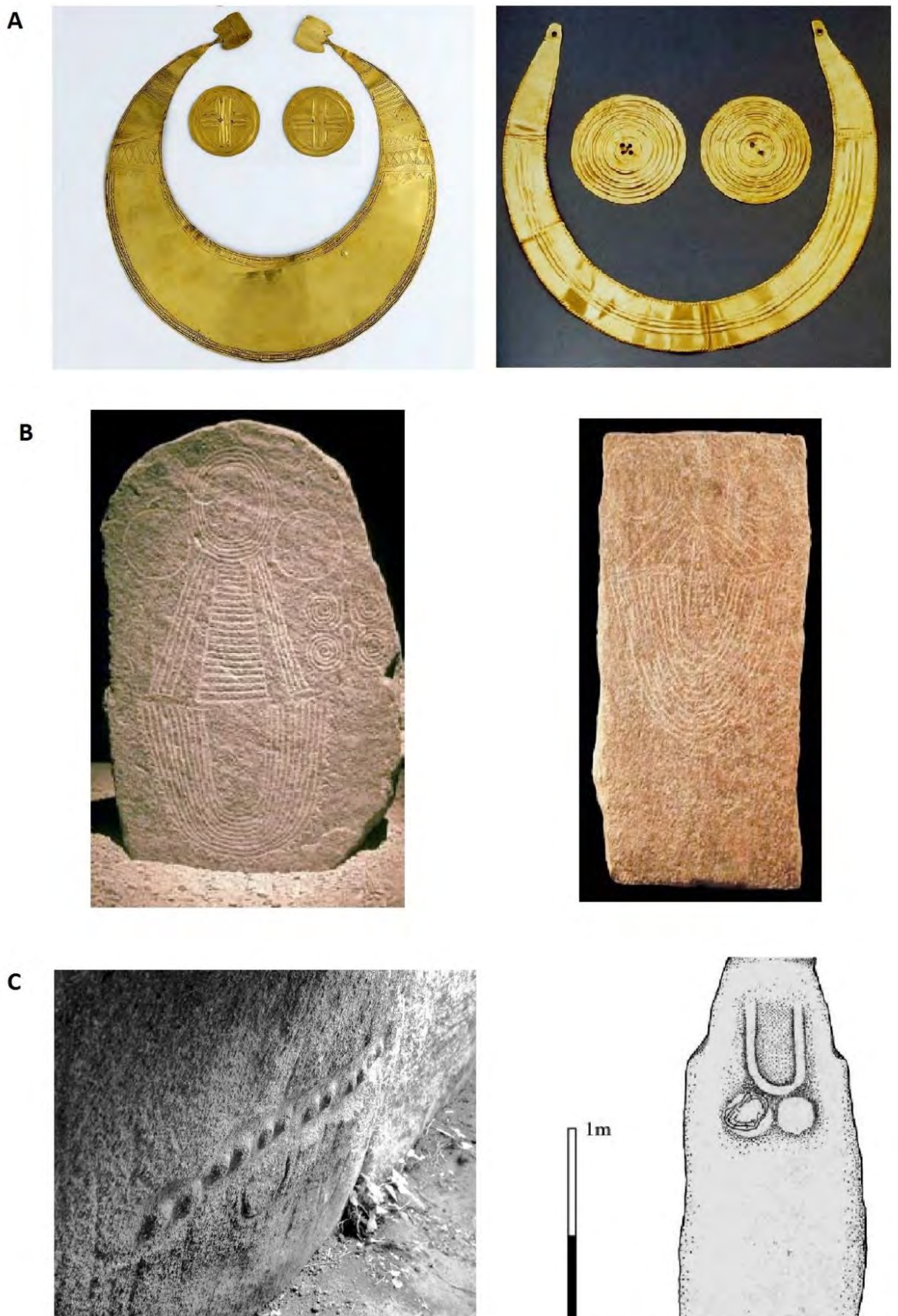


Figure 5.12: Possible representations of 'double suns' and solar boats. (A) (Left) Gold lunula and a pair of gold discs from Coggalbeg (Ireland) (Cahill, 2015: Plate 12.); (Right) Gold lunula and a pair of gold discs from Cabeceiras de Basto (Portugal) (Cahill, 2015: Plate 9.); (B) (Left) Monumental Copper Age composition at Caven 3, Valtellina (Italy) (Anati, 2008: no figure number); (Right) Monumental Copper Age composition at Cornal 1, Valtellina (Italy) (Anati, 2008: no figure number); (C) (Left) Row of 'paired breast carvings with necklaces', Kergüntuil allée couverte, northern Brittany (France) (Scarre, 2008: Fig. 5.); (Right) Le Câtel statue-menhir, Guernsey (Scarre, 2008: Fig. 3.)

Chalcolithic Beaker-associated gold lunulae (found in the British Isles, France, Iberia, Denmark and Poland) (Eogan, 1994: 30; Makarowicz, 2003a: 138; Vandkilde, 2005: 24-25; O'Brien, 2012: 219; Needham and Sheridan, 2014: 909-912; Cahill, 2015: 31-33), have a similar appearance to the crescent-shaped craft identified by Cassen, and Cahill (2015) has recently outlined a compelling argument further advocating their strong resemblance to boats and being conceived as a form of wearable vessel guiding and protecting the sun. In this context Cahill highlighted their connection with gold discs some of which have been discovered in pairs and on occasion in direct association with lunulae, or as she has re-dubbed them "sunulae" (Figure 5.12). Again this combination of artefacts may have evoked 'double sun' and ship symbolism and similar associations are likely to have been attached to the lunula-like crescentic jet necklaces (Shepherd, 1981, 1985; Sheridan and Davis, 1988, 2002). In addition to the physical necklaces themselves, a number of the anthropomorphic and 'plaque-like' stelae and menhirs from north- and central-western Iberia, the majority of which are believed to date to the second half of the 3rd and possibly the earlier centuries of the 2nd millennium BC (although the Serra Boulhosa specimen may be earlier), feature broadly comparable crescent-shaped necklaces (Varela Gomes and Pinho Monteiro, 1977: Fig. 8.2-7; Bueno Ramírez, et al., 2005: 604, 617, 628-630, Figs. 27, 41, 42). Two boat models believed to date to the second half of the 2nd or early 1st millennium BC have been discovered in Britain, these being the gold-inlayed, ceramic 'Caergwrle Bowl' which may represent a skin boat or 'coracle' and features decoration which includes possible solar-symbols, from (Flintshire) north-east Wales (Denford and Farrell, 1980) and the 'crewed' wooden Roos Carr (Yorkshire) model from north-east England which features an animal-head protome with sockets for quartz eyes (Sheppard, 1901, 1902; McGrail, 2014: 84)

The southern Scandinavian rock-art tradition found throughout middle Sweden and western Norway began c. 1700 BC (or earlier). Some of the earliest ship representations of this tradition in Norway overlap geographically with the northern tradition and notably some of the vessels resemble examples from the latter area suggesting a connection (Ling, 2004, 2008; Bradley and Nimura, 2013: 16-17, 21). This rock-art tradition provides the most comprehensive depictions of the solar journey in Europe (Gelling and Ellis Davidson, 1969: 11-14; Kristiansen, 2012: 74) and panels which depict aspects of the mythology quite elaborately have been identified (e.g. Kristiansen, 2012: 76; Melheim, 2013; Ling and Rowlands, 2015). The same cosmology appears to be depicted on Bronze Age metalwork in Scandinavia and Germany. A small number of artefacts dating to c. 1700-1500 BC, such as the bronze 'Nebra disc' (c. 1600 BC) from (Saxony-Anhalt) eastern Germany (Figure 5.10; Meller, 2002; Schlosser, 2002, 2003; Pásztor and Roslund, 2007: 271; Maraszek, et al., 2009: 50-56) and the Danish Rørby bronze sword (c. 1700-1600 BC) (Kaul,

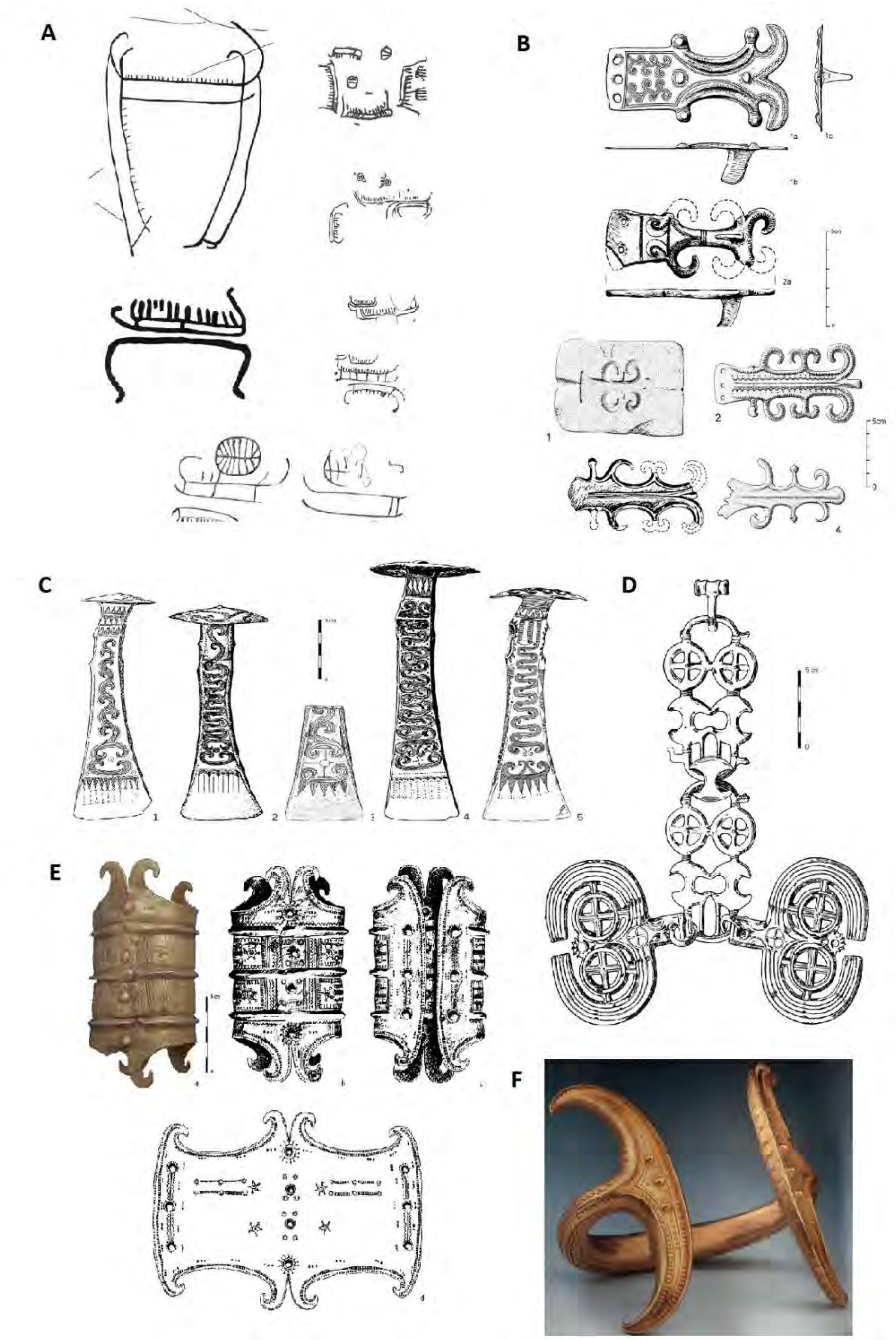


Figure 5.13: Representations of paired 'day and night' ships in Scandinavia and the Carpathian Basin. The underworld or the lower realm is presented with ships turning upside down. (A) Examples of paired ships in Scandinavian rock art (Kristiansen, 2012: Fig. 6.5.); Selection of belt-hooks from the Carpathian Basin. Top: 1-2: Hungary; Bottom: 1: Tiszafüred-Ásotthalom (Hungary); 2: Dunaújváros-Dunadűlő (Hungary); 3. Iváncsa (Hungary); 4: Chľaba (Slovakia) (adapted from David, 2003b: Abbs. 1.1., 2.1.); (C) Selection of 'Nackenscheibenäxte' from the Carpathian Basin. 1: Cajvana (Romania); 2: Tiszaladány-Nagyhomokos (Hungary); 3-4: Hungary; 5: Hajdúsámson (Hungary) (adapted from David, 2010: Abb. 3.); (D) Bronze pendant from Rimavská Sobota (Slovakia) (David, 2010: Abb. 31.); (E) Gold armband from Dunavecse (Hungary) (David, 2010: Abb. 15.); Gold arm-ring from Biia (Bendendorf/Magyarbénye) (Romania) (David, 2010: Abb. 14.)

1995: 61-64, 1998: 78-79) display boat symbols. It has also been suggested that the Rørby specimen and a series of similar curved swords from Norway, Denmark and Sweden (Kaul, 1995: 61-64, 1998: 78-79) with a distinctive blade-shape may themselves represent ship-symbols or representations of half ships with inward- and backward-turning prows (Kaul, 1998: 73-74, 85). Boats with stylised horse-head proteomes and wheel crosses feature on the bronze Vismar/Wismar horn (c. 1300-1100 BC or possibly c. 1500-1300 BC) from (Mecklenburg) northern Germany (Kaul, 1998: 92-93; Kristiansen and Larsson, 2005: 194-195).

Kaul (1998, 2014) has demonstrated that depictions of horses, boats and the sun on Danish (and German) bronze razors (c. 1100-500 BC), which include ship representations, depict the same solar journey as Scandinavian rock-art (Figure 5.1) and Kristiansen (2012: 74) has highlighted the occurrence of twinned ships on numerous examples. Boat motifs also occur on such bronzes as Danish hanging bowls (c. 1100-500 BC), Danish and north German swords, knives, tweezers, socketed bronze axes and neck rings (c. 1100-700/500 BC) (Kaul, 1998: 102-103, 161-164) and paired ships depicted keel-to-keel occur on bronze neck rings (c. 900-500 BC) from Sweden, Denmark and northern Germany (Kaul, 1998: 102-103, 157-161; Waddell, 2012: 342, 2014: 46).

During the Scandinavian Early Bronze Age a significant number of the burials beneath round barrows in Denmark were placed in graves which had the outline of small boats (Ballard, et al. 2003: 389; Bradley, 2006: 379). Rock-art motifs, including examples of both 'day- and night-ships' were also incorporated into burial monuments (c. 1500-800 BC) in Sweden, western Norway and Denmark (Goldhahn, 2009; Bradley, et al., 2010: 93; Bradley and Nimura, 2013: 17; Goldhahn and Ling, 2013: 284-285). It is argued that ship-like stone settings (Figure 5.11) may have emerged in southern Scandinavia as early as c. 1900-1700 BC, gradually becoming more common during the later 2nd and earlier 1st millennia BC (Nicklasson, 2005: 61; Wehlin, 2010: 96-97; Artursson, 2013). About 380 occur along or close to the coast of Gotland (Sweden) and date to the LBA (c. 1100-500 BC) or in some cases potentially Early Iron Age (Capelle, 1995; Skoglund, 2008; Bradley, et al., 2010; Wehlin, 2010). These settings may depict 'crews' and travel in opposing directions (Bradley, et al., 2010).

In the Carpathian Basin a possibly early clay boat model (c. 4900-4500/4400 BC) was found on a settlement site at Hódmezővásárhely-Gorzsa, Eastern Hungary (Horváth, 2003; Kiss, 2007: 121). However, indisputable representations of ships are extremely rare in the region until the 2nd millennium BC and even the earliest examples, such as motifs on a bird-shaped clay rattle (c. 2000-1700 BC) from Zagyvapálfalva (Nógrád), Hungary (Guba and Szeverenyi, 2007: 93) and clay models (c. 1800-1500 BC) from Darda, Croatia and Orsoya, Bulgaria (Guba and Szeverenyi, 2007:

93; Kiss, 2007: 119, 121) are not entirely unequivocal. Paired ships, either depicted keel-to-keel or 'surrounding' solar-symbols feature on numerous axes, swords, belt-hooks and bracelets from the Carpathian Basin (c. 1900/1800-1400 BC) (Kaul, 1998: 279; David, 2003a, 2003b, 2010; Guba and Szeverenyi, 2007: 93). Boat-shaped pendants with bird-head protomes (1500-800 BC) also occur in various parts of the Carpathian Basin (Guba and Szeverenyi, 2007: 91) and similar items occur in eastern Italy and Denmark, the latter possibly an import from the Carpathian Basin (*ibid*.). Solar-ships appear on a number of solid-hilted bronze swords (1100/1000-800 BC) from the region (*ibid*.: 90-91) and boats depicted keel-to-keel occur on Urnfield B1 type bronze cauldrons, Hajdúböszörmény type buckets and Mariesminde type bronze amphorae (Guba and Szeverenyi, 2007: 89; Waddell, 2012: 340-343, 2014: 38, 44-46).

5.5 Milky-Way and the (Rain)bow

In Egyptian iconography of the 3rd millennium BC the mythological union of Nut (goddess of sky) and Geb (the earth god) is occasionally symbolised by the phallus of the prone earth-god reaching towards the goddess' body. However, in depictions of the scene Nut is frequently arching her body over Geb who reclines beneath with one arm to the sky and the other to the earth (Figure 5.1; Hart, 2005: 58, 110, 113, 147; Haggag, 2013: 24). This arched position refers to Nut being the personification of the Milky Way, with her head in the west and feet in the east. However, although depictions appear to indicate that Nut is stretching her body with arms and legs tightly together, the actual concept is that her fingers and toes touch the four cardinal points (Hart, 2005: 110; Kramer, 2010: 31). As represented in Egyptian art the goddesses head is formed by a cloud of stars near Gemini, brighter stars in the constellations arranged along the Milky Way represent her body, and her legs by the bifurcation at the constellation of Cygnus. On representations of Nut, Cygnus is depicted as a cross, the symbol used to denote female genitalia on early Egyptian figurines. The conception and birth of Ra/Horus as connected with the yearly solar journey occurs over nine months, referencing the human gestation period. On this time-scale Ra/Horus is conceived during the spring equinox. About an hour and a quarter after sunset around the equinox the Milky Way would become visible and 'Nut's head' would have become visible on the horizon with her 'mouth' near due west where the sun had set, as if the goddess had consumed the sun. Over the ensuing nine months the sun moves northward along the Milky Way to be "re-born" on winter solstice, the beginning of the light half of the year. As has been demonstrated (Wells, 1992: 314-315) in the context of explaining the mythology of Nut and the birth of Ra in pre-dynastic Egypt (c. 3500-3100 BC), that in the Northern Hemisphere, after sunset on the spring equinox, the Milky Way would have appeared on the horizon in a position where it

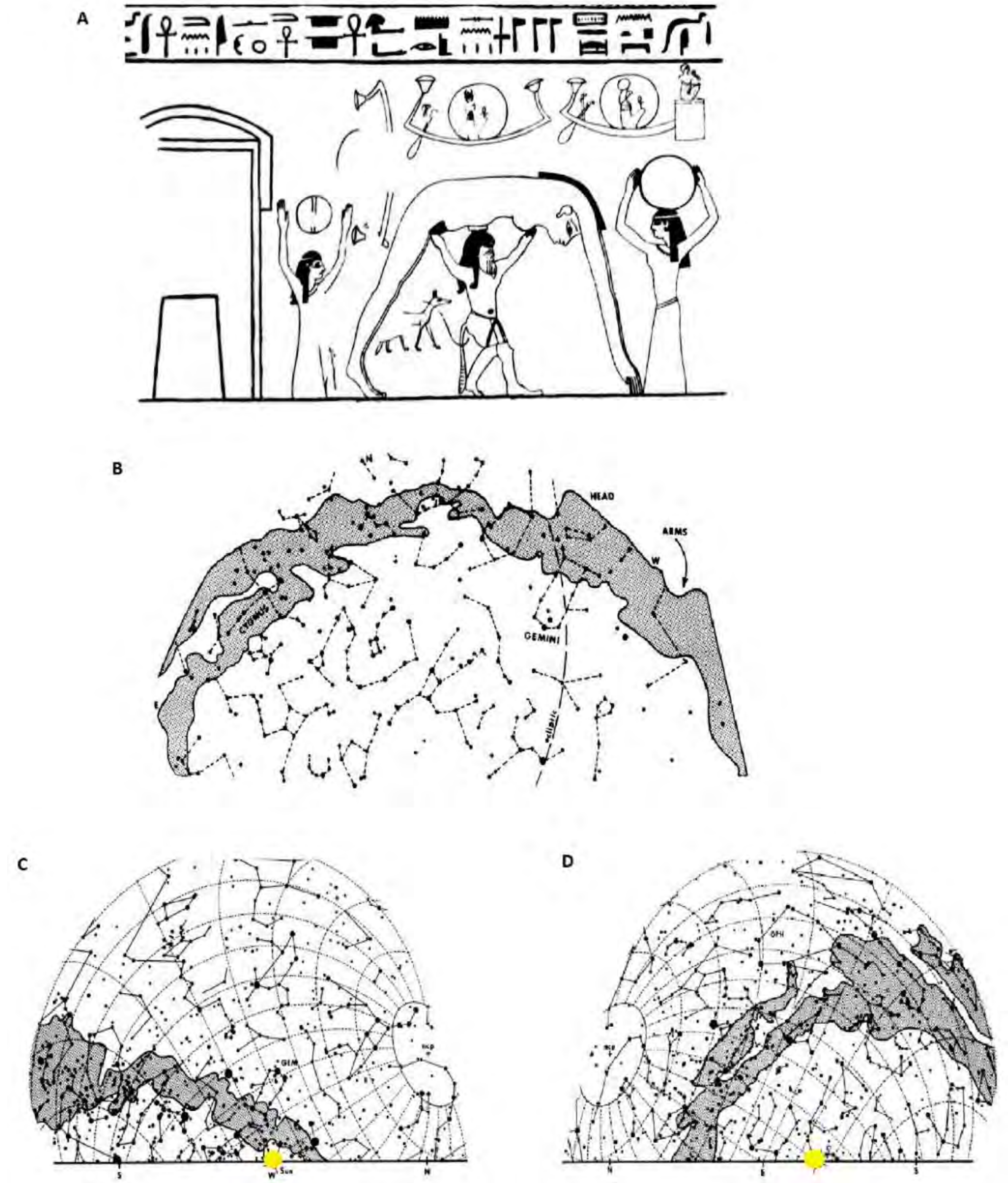


Figure 5.14: Identifying Nut as the Milky Way. (A) Nut arched over the sky as depicted in the Coffin of Ankhrui (Kramer, 2010: Fig. 2.); (B) A modern representation of the Milky Way for northern latitudes depicted with the correspondences to images of Nut highlighted. Shown are the bifurcation at Cygnus (left) forming the legs, the swelling of the star clouds in Gemini (right) forming the head (face downwards), and the distribution of the brighter stars in the constellations along and within the Milky Way itself. Note also that the ecliptic (path of the sun) passes through the head's mouth (Wells, 1992: Fig. 2.); (C) The appearance of the western horizon in northern latitudes at sunset on the Vernal Equinox (3500 BC) (Wells, 1992: Fig. 5.); (D) The appearance of the eastern horizon at sunrise on the morning of the winter solstice (3500 BC) (Wells, 1992: Fig. 4.)

appeared the goddess had consumed the sun; while before sunrise on the winter solstice the goddess would appear on her back with legs apart, one higher than the other upon the horizon before giving birth to the sun (Figure 5.14). Thus, the mid-winter sun would have appeared to emerge from the Milky Way as it rose above the horizon quite distinctly (Wells, 1992: 319-320; Maravelia, 2003: 68-72).

Across Eurasia the Milky Way represented the 'route of dead souls' (Gibbon, 1972: 238, 240; Kuperjanov, 2001; Dy-Liacco, 2014) and was regarded as the celestial prototype, origin and counterpart of numerous rivers (Bertola, 2003: 96-102; Dy-Liacco, 2014: 158; Rappenglück, 2014: 298). Cross-culturally rainbows have been interpreted as a manifestation of the Milky Way at daytime indicating a close symbolic relationship (Blust, 2000: 525-527). Rainbows have been described as bridges to the heavens in various traditions. In Europe, the Bifröst or Bilröst Bridge of Germanic mythology, which may have been directly associated with the Milky Way in addition to rainbows, is a prominent example. This bridge, as described in the 13th century AD Icelandic *Eddas*, connected the world of the living (Midgard) with that of the deities (Asgard) (Lee and Fraser, 2001: 33; Rappenglück, 2014: 299). Rainbows were also considered to be a celestial bridge between realms, and a 'boat of souls' was closely linked to the 'tree of life' in Indonesian tradition (Lee and Fraser, 2001: 32; Wessing, 2006: 212-213; Rappenglück, 2014: 299) and a similar connection has been argued for the Philippines (Dy-Liacco, 2014). A 'soul bridge' concept is also inferred by the Siberian Buryats shaman's symbolic ascension to the sky 'spirit-world' via the rainbow (Eliade, 1964: 118). A connection between the Milky Way, winter solstice, and the 'soul bridge' is suggested by the link between the solstitial direction and "gates of heaven" in various cosmological doctrines including the Roman Mithraic (Beck, 2000: 160) and Vedic (Gibbon, 1972: 238; Bakker, 2004: 119) traditions. An analogous connection with rainbows has been suggested for depictions of 'winged gates' on Northern Syrian and Mesopotamian seals dating to the second half of the 3rd and 2nd millennia BC (Van Loon, 1992) and similarly arch-shaped "gates to paradise" are found in the Zoroastrian tradition (Kryukova, 2007).

5.5.1 'Bow' Symbolism

Probable 'bow' symbolism has been identified in France (c. 4500/4200-4000/3900 BC) where 'nested arc' motifs occur on pottery, particularly on vessels of the Breton Castellic style (Figure 5.15). These have been interpreted as depictions of rainbows and similar motifs have been noted to occur on potentially early (suggested to date to as early as c. 4200-3900 BC) ceramics in the British Isles (Cassen, 2000b: 443-446, 454-457; Sheridan, 2000, 2010: 92). The decoration on a particularly notable specimen, discovered in a tomb at Lannec er Gadouer (Morbihan), featured a 'ramiform' or 'arboriform' motif flanked by two semi-circles sitting on an incised line delimiting the diameter of the pot below which three horizontal serpentiforms are depicted (Cassen, 2000a: 718, 721, 2000b: 454). Arc motifs deployed as distinct compositional elements, and similarly interpreted in terms of rainbow symbolism, have been recorded in two of Breton (Morbihan)

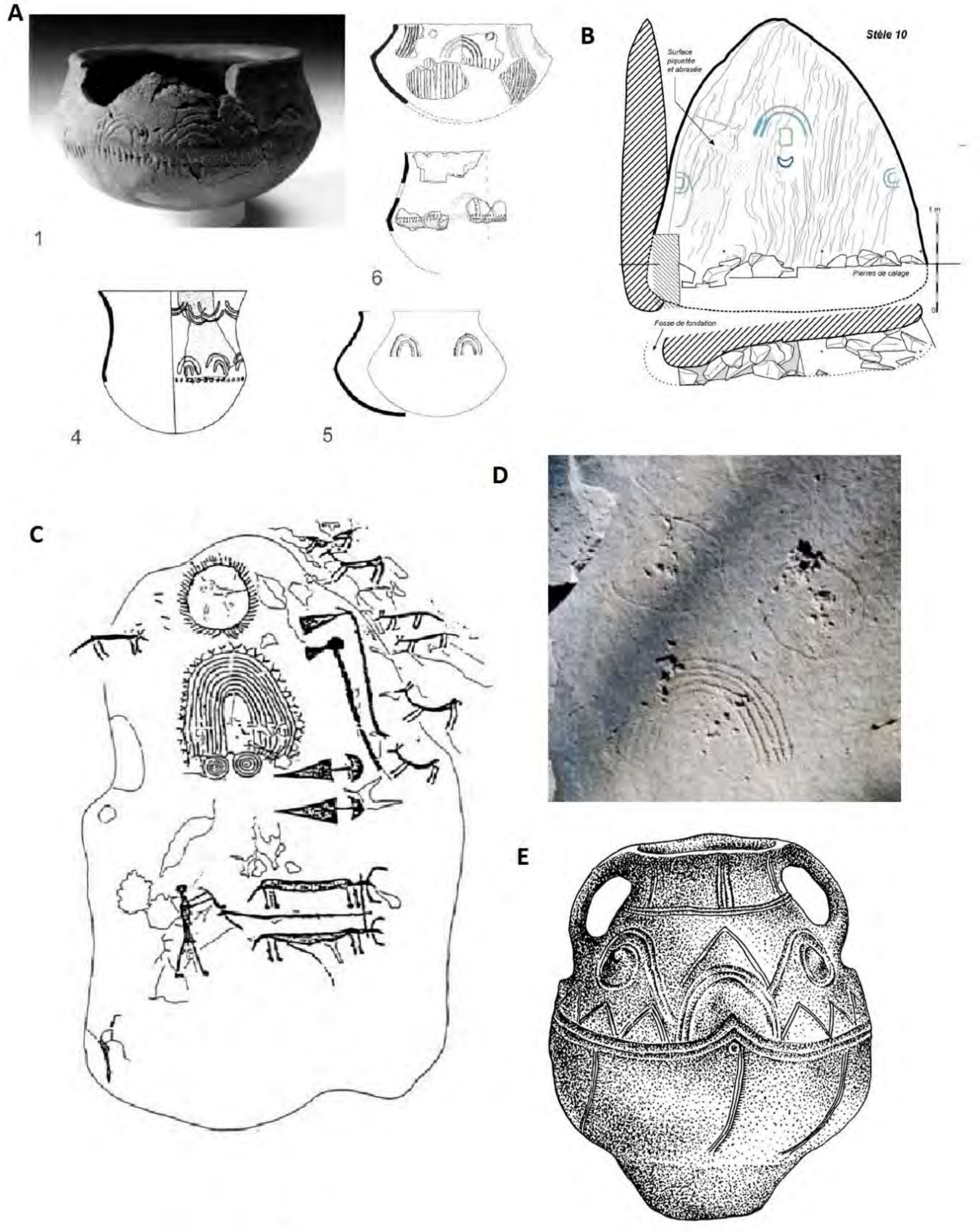


Figure 5.15: Selection of 'bow' symbols. (A) Pots from British Isles with some French comparanda. Top: Breton-style pot from Achnacreebeag (Scotland) and carinated bowl from Ballymacaldrack (Ireland); Bottom: 4: Early Castellic bowl from Le Castellic, Brittany; 5: Late Castellic bowl from Vierville, Normandy; 6: Late Castellic bowl from Er Grah, Morbihan (adapted from Robin, 2009: Fig. 103; Sheridan, 2010: Fig. 9.3.); (B) Back of stele 10 in the Table des Marchands, Morbihan (France) (Cassen 2011: Fig. 17.); (C) Bagnolo 2, Valcamonica (Italy) (Woudhuizen, 2010: Fig. 2.); (D) Foppe di Nadro (rock) 30, Valcamonica (Anati, 2008: no figure number); (E) Ceramic vessel from Szelevény-Menyasszonypart (Hungary) (David, 2010: Abb. 43.)

megaliths. On orthostat 10 in the Table des Marchands (Figure 5.15) a double arc features above a quadrangle and crescent-shaped 'ship' (Cassen, 2011: 48, 50-51) and on orthostat 8 in Gavrinis an axe-motif is situated to the right of a pair of double arcs which flank a 'crozier/crook/lacrosse' motif above a horizontal line under which three vertical serpentiforms and three axes occur (Cassen, 2000a: 721). In northern Italy an interesting example of a bow situated below a pair of circular symbols (potentially a 'double sun') occurs in the Valcamonica rock art region (Lombardy) on Rock 30 at Foppe di Nadro (3300-2500 BC) which is located next to a water source (Figure 5.15; Anati, 2008: 25).

Schematic anthropomorphic figures (X, Y and 'phi'-like), with 'ancoriform' (i.e. anchor shaped) "heads", possibly representing bow-shaped headdresses, appear to have been a feature of Iberian painted rock art over an extremely extended period lasting from at least the 6th/5th to the mid-3rd or possibly 2nd millennium BC (Figure 5.16; e.g. Gómez-Barrera, 2005: 29, 39; Hernández Pérez, 2014: 145, 148; Wintcher, 2011: 141, 181-182). Possibly overlapping with these depictions chronologically, bow-type symbolism may also be associated with a number of Iberian stele forms, the majority of which are believed to date to the second half of the 3rd and 2nd millennia BC. These include the frequently megalithic tomb associated 'plaque-like' examples of northern Iberia which feature semi-circular "heads" or "hood ornaments" (Figure 5.16). Further stele featuring more naturalistic anthropomorphs with bow-like "headdresses" occur in western parts of central and southern Portugal. All of these are believed to date to between the second half of the 3rd and possibly the earlier centuries of the 2nd millennium BC (Almagro Basch, 1966-67: 11-12; Varela Gomes and Pinho Monteiro, 1977: 188, 190; Bueno Ramírez, et al., 2005: 586-595, 601-610, 627-635, 2007: 609-611, 628-629). Similar bow-type symbolism appears to continue among the 'warrior stelae' of the later 2nd millennium BC (Figure 5.16). For instance, there are a small group of 4/5 with figures wearing disproportionately large 'diademadas' or 'headdresses' (Harrison, 2004: 102, 117-118, 163-164) and arguably similar interpretations could be attributed to the 'crested helmets' depicted on 4/5 others (*ibid*.: 138-142).

Evidence for bow-shaped headdress has been recorded on occasion in Central Europe (Figure 5.16). For instance a specimen was found with an adult female (grave 110) at Franzhausen I (c. 2300-1600 cal BC) in southern Austria (Neugebauer and Neugebauer, 1997) and this is itself reminiscent of a possible headdress depicted on a female Baden Culture (c. 3600-2800 BC) 'idol' from Méhi/Včelince in southern Slovakia and an indisputable depiction on a female Makó Culture (c. 2100-1600 BC) 'idol' fragment from Kőérberek (Tóváros-Lakópark) in Hungary (Kovács, 2002: 21; Horváth, 2005; Horváth, et al., 2005: 152; Horváth 2014: 515-516). Bow symbolism also

Figure 5.16: Examples of bow-shaped 'headdresses'. (A) 'Plaque-like' statue Stelae in western Iberia. 1: Peña-Tú, Asturias; 2: Granja de Toniñuelo, Badajoz; 3: Ciudad Rodrigo, Cáceres; 4: Hernán Pérez VI, Cáceres; 5: H. Pérez I; 6: H. Pérez II; 7: Robledillo de Gata, Cáceres (Varela Gomes and Pinho Monteiro, 1977: Fig. 8.); (B) Abstract "Idol" figure with an apparent headdress, Panel 2, La Serreta (Spain) (Wintcher, 2011: Fig. 6.20.); (C) Iberian 'warrior stelae' compositions with Diademadas. Note that none have shields or weapons. (adapted from Harrison, 2004: Fig. 6.14, Cat. X95); (D) Fragments of female figurines with bow-shaped headdresses. Left: Kőérberek (Tóváros-Lakópark) (Hungary) ((Horváth, 2005: no figure number); Right: Méhi/Včelince (Slovakia) (Horváth, 2014: Plate 6.1.); (E) Iberian 'warrior stelae' depictions of 'helmet' motifs (adapted from Harrison, 2004: Fig. 7.12); (F) The one surviving backwards-bending bronze figurine from the Grevensvænge hoard (Denmark) (Iversen, 2014: Fig. 2.); (G) Rock-carvings showing 'ship-leapers'. Sottorp and Tanum, Bohuslän (Sweden) (Iversen, 2014: Fig. 3.)

appears to be evoked by the ‘ancoriform’ “weapons”, described as axes or halberds, depicted on a series of later 2nd millennium BC stelae in the Alentejo region of south-central and southern Portugal (Almagro Basch, 1966-67: 3-9; Varela Gomes and Pinho Monteiro, 1977: 172-174, 178-183, 193; Bueno Ramírez, et al., 2005: 614, 630-635). Almagro Basch (1966-67: 4-6) doubted their interpretation as axes and likened them to a series of Neolithic ‘ancoriform’ bone “idols” mdiscovered in a number of megaliths in southern France and ceramic “anchors” which are found across the eastern Mediterranean and Balkans (*ibid*.: 6-7).

5.5.1.1 ‘Acrobats’

Various researchers (e.g. Gelling and Ellis Davidson, 1969: 43-45; Kristiansen and Larsson, 2005: 229-231; Iversen, 2014) have suggested that the depictions of so-called acrobats in Scandinavian rock-art (Figure 5.16) may refer to ceremonies undertaken upon ships during the Bronze Age. However, it might be argued that these may in fact refer to the Milky Way placed above solar-boats and thus refer to the connection with the solar journey of the sun, particularly in view of the Scandinavian boats in more general terms. On occasion more than one of these acrobats is depicted and it may be that the addition of figure(s) in acrobatic postures relates to the mythology of the daytime solar journey. This is not to suggest that these depictions do not to refer to actual real-life acrobatics also as depictions and references to such practices exist in both the Egyptian and Mediterranean worlds (Kristiansen and Larsson, 2005: 229; Iversen, 2014: 4, 7) and variously among the exploits of gods in Norse and Irish mythology (Kristiansen and Larsson, 2005: 229-231). As noted by Iversen (2014: 2-3) at least six bronze figurines, recovered at Grevensvænge on southern Zealand in Denmark (dated to c. 1100-900 BC.) included three identical back-bending female acrobats (Figure 5.16), two inverted squatting men wearing horned helmets and holding large cultic axes and a single standing woman with a fibula on her chest. This find does seem to support the suggestion that these acrobats did actually play a role in mythology surrounding the yearly and/or perhaps daytime segment(s) of the sun’s journey.

5.5.1.2 ‘Mushroom-Shaped’ Symbol

Arguably, another symbol associated with Scandianavian ship-representations, the so-called ‘mushroom-shaped’ symbol (Figure 5.17), which occurs in a number of variant forms (Kaul, 1998: 188-195), could have carried similar connotations. This symbol has been recorded on Danish, Swedish, German and Dutch razors, Danish and Swedish neck rings, Danish, Swedish and German hanging vessels, a pair of axes from Viby (Zealand, Denmark), a sword from Blekinge (Sweden) and a few occur on ships from Swedish rock-art including examples of the ‘spiral-volute’ variant. When the symbol is associated with boat representations it appears standing amidships or as protome ornamentation and often occurs alongside possible solar symbols (*ibid*.: 188-190).There are a number of motifs from the Italian Proto-Villanova culture that resemble the symbol and it has been suggested that these were the inspiration for the Scandianavian variants (see *ibid*.: 190-191). Kaul (*ibid*.: 190-195) has proposed that the 'mushroom-shaped' motif simultaneously symbolized contemporary axes and alluded to ship protome 'figureheads' as a form of "standard". However, the current author would argue that bronze axes of 2nd millennium BC featuring notably prominent 'wing-flanges', which are found across Europe (Figure 5.17), including in Ireland (see Harbison, 1969b; Eogan, 1983, 2000; Ramsey, 1989, 1995; Becker, 2006, 2013) encompassed the same symbolism as the 'mushroom-shaped' motif but the latter did not depict the former, and it is feasible that both referenced 'bow' symbolism. Gelling and Ellis Davidson (1969: 59, 132) suggested that 'mushroom-shaped' motifs could be stylised representations of trees and symbols of "the great support which held up the sky". A cross-reference between milkyway/bow and world pillar/tree could certainly be argued and in this context a connection with lotus/lily/ivy symbolism could also be feasible.

5.5.1.3 Lotus/Lily/Ivy Blossom

The lotus blossom symbol originated in Egypt and was in use throughout the 3rd millennium BC, but the lily motif was re-imported from Crete in the 2nd millennium BC and was also used in

Egyptian iconography on textiles and frequently in hieroglyphic script (Kristianssen and Larsson, 2005: 142; Klontza-Jaklová, 2012: 5, 7). In Egyptian tradition the lotus/lily was the symbol of daily reincarnation, its stem being a symbol of the umbilical cord and the sungod Ra was depicted sitting on top of the primeval lotus (Renggli, 2002: 5). The cordiform leaf motif (i.e. heart-, lotus, lily-, or ivy-leaf-shaped) was employed widely in Aegean iconography, notably in Minoan/Mycenaean traditions (c. 2100/1900-1000 BC), where it occurred in a variety of media including wall paintings, pendants, beads, ceramics and seals (Klontza-Jaklová, 2012; Kristianssen and Larsson, 2005: 142-145). Bronze cordiform leaf pendants (Figure 5.17) occurred across the parts of Carpathian Basin during the early stages of the 2nd millennium BC, before spreading to parts of Moravia and Bohemia (c. 1700/1600-1500/1400 BC) and subsequently over large parts of Central and Eastern Europe (c. 1300-800/750 BC) (Kristianssen and Larsson, 2005: 145-147; Klontza-Jaklová, 2012: 1). It is possible that in the Carpathian Basin 'bow' (or related lotus/lily/ivy symbolism) was also symbolically referenced in such objects as 'comb-shaped' pendants featuring stylized ships with bird-head protomes (c. 1800-1600/1500 BC), which incorporate 'mushroom-motif' like elements, comparable 'hanger' or 'horn' shaped pendants (Figure 5.17; Růžičková, 2009: 58-59; David, 2010: 453; Hänsel, 2012: 113), and potentially a bronze 'diadem' or 'tiara' (c. 1400-1300 BC) from Pitten, Lower Austria (Růžičková: 58-59; David, 2010: 453, 476). A series of

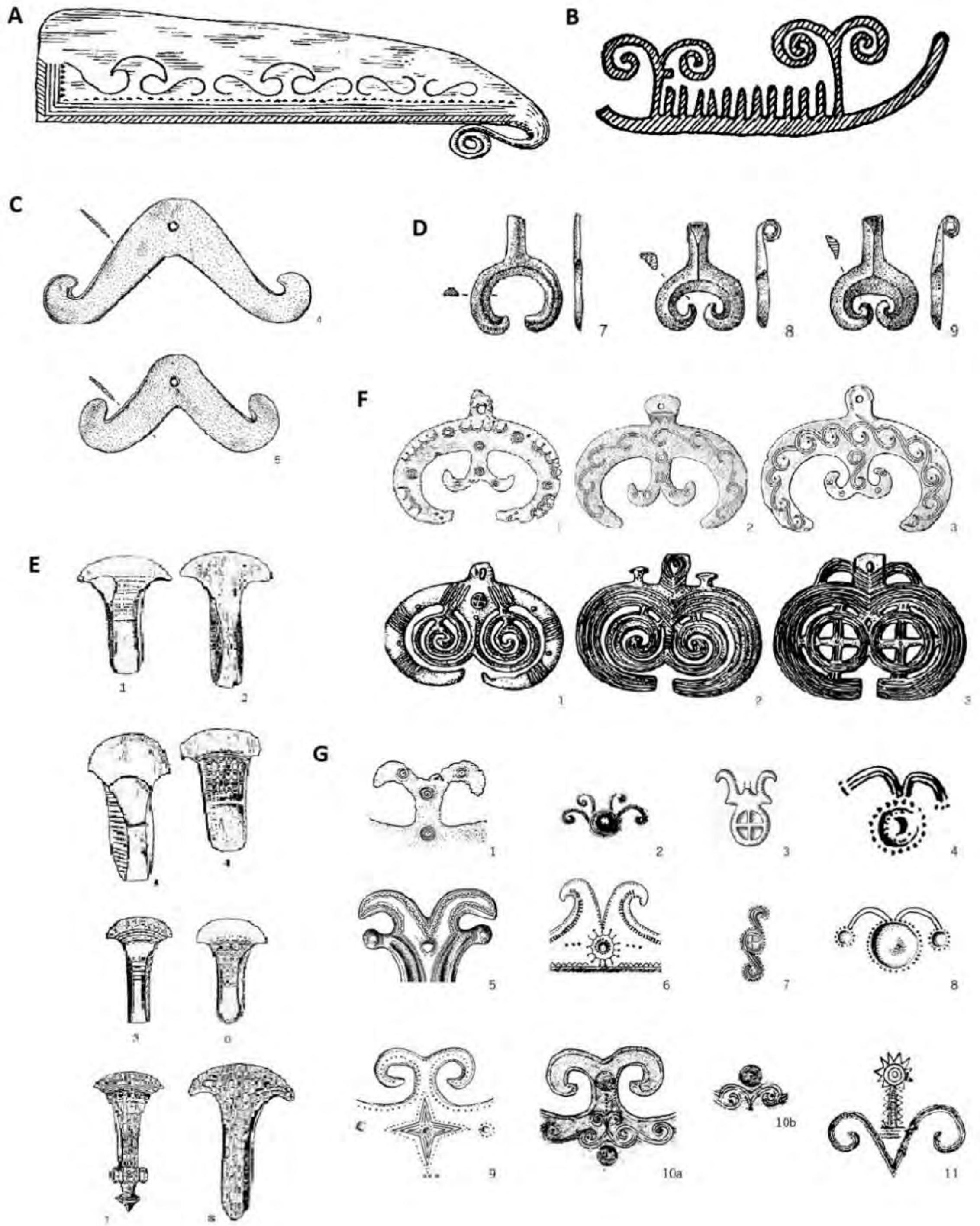


Figure 5.17: Examples of 'mushroom-shaped' and 'lotus/lily/ivy blossom' symbolism. (A) Razor with two mushroom-shaped or cult-axe-like figures from Gröstorp (Sweden) (Kaul, 1998: Fig. 118.); (B) Rock-carving ship carrying two mushroom-shaped symbols at Brå(Sweden) (Kaul, 1998: Fig. 120.); (C) Hanger or 'horn-shaped' bronze pendants. 1: Carnuntum (Lower Austria); 2: Vörs-Battyáni disznólegelő (Hungary) (David, 2010: Abb. 25.); (D) Lily-shaped bronze pendants from the Balatonboglár-Szőlőskislak hoard (Hungary) (David, 2010: Abb. 32.); (E) Examples of bronze axes with exaggerated flanges. 1: Oswestry (England); 2: Carnarvon (Wales); 3: Menai (Wales); 4: Ireland; 5: Sussex (England); 6: Dorset (England); 7: Denmark; 8: Plynstock (England) (Almagro Basch, 1966-67: Fig. 2.); (F) Examples of "anchor-shaped" bronze pendants from the Carpathian Basin. Top: 1: Budapest (Hungary); 2: Barca (Slovakia); 3: Nižná Myšľa-Várhegy (Slovakia); Bottom: pendants from the Kisterenye hoard (Hungary) (David, 2010: Abb. 21., 30); (G) Variations of the 'horn-shaped' motif and circular, projection or 'wheel-cross' symbols. 1: Budapest (Hungary); 2: Bilje (Hungary); 3 Včelínce-Lászlófala (Slovakia); 4: Tiszafüred-Majoroshalom (Hungary); 5: Hungary; 6: Dunavecse (Hungary); 7: Megyaszó (Hungary); 8: Tiszafüred-Majoroshalom (Hungary); 9: Hodejov (Slovakia); 10: Crestur (Romania); 11: Nagyrozvágy (Hungary) (David, 2010: Abb. 29.)

"anchor-shaped" bronze pendants (c. 1500-800 BC) from the Carpathian Basin, frequently interpreted as representations of birds (Guba and Szeverenyi, 2007: 91; Pásztor, 2011: 137), feature various solar-associated motifs (David, 2010: 449, 457, 461-467), should perhaps be interpreted foremost as inverted solar-boats (Figure 5.17). If viewed in an inverted position many of these items can be understood as boats carrying 'spiral-volutes', while in a number of instances they carry wheel-cross 'double-suns'. This is not to suggest that a symbolic duality is not present, as avian imagery may also have been intentionally referenced when the pendants hung naturally. The same arrangement of solar boat and 'spiral-volute' occurs on bronze belt hooks from Dunaújváros-Dunadűlő and Iváncsa (Figure 5.13), in Central Hungary (David, 2003a). It may also be advanced that the 'spiral-volute' variant of the Scandinavian 'mushroom-shaped' symbol, two of which occur on a ship on a rock art panel at Brå (Bohuslan) in Sweden for example (Kaul, 1998: 189, 193), may have some affinity with the cordiform leaf motif.

5.5.1.4 'Ramiform' and 'Arboriform'

A further symbol which may denote connection between the world of the living and the heavens is the 'ramiform' ('branch-like') or 'arboriform' ('tree-like') motif. The appearance of this motif can be quite 'naturalistic', but there are also more schematic variants which may allude to the same concept. Naturalistic depictions of this motif occur within the French Breton repertoires of

Castellic pottery and megalithic art where occasional examples have been recorded on menhirs and in megalithic tombs (Cassen, 2000a: 718, 721; Le Quellec, 2006: 694, 714; Robin and Cassen, 2009: 854-855; Robin, 2012: 144-145). There do not appear to be many schematic variants in Brittany, but it has been argued (Robin and Cassen, 2009: 854) that 'buckler' symbols (see Shee Twohig 1981: 68-69) in the 'angled passage grave' at Pierres Plates (orthostats R12 and R15), are in fact abstract variants of the 'ramiform' motif.

The term 'ramiform' is applied to a wide variety of symbols in Iberian Neolithic-Bronze Age art (e.g. see Salmerón Juan and Teruel Juliá, 1990; Gómez-Barrera, 2005; Wintcher, 2011), but not all of these can be described as overtly 'arboriform' or 'tree-like' in nature. Nevertheless, representational 'arboriform' symbols (Figure 5.20) are a feature of the Cardial pottery decoratve repertoire and on occasion are a feature of the so-called the 'Levantine style' rock art paintings, both emerging sometime during the period c. 5600/5500-4500 BC (Martí Oliver and Juan-Cabanilles, 2002: 156; Gómez-Barrera, 2005: 34; Mateo Saura, 2005: 139-151, 2008: 8-9; Hernández Pérez, et al., 2007: 49, 52-53, 58-59; Wintcher, 2011: 59-61, 70; Collado Giraldo and García Arranz, 2013: 295; Hernánandez Pérez, 2014: 148). In the repertoire of Iberian megalithic art, the motifs Shee Twohig (1981: 22) described as rows of triangles or v's may be included in the

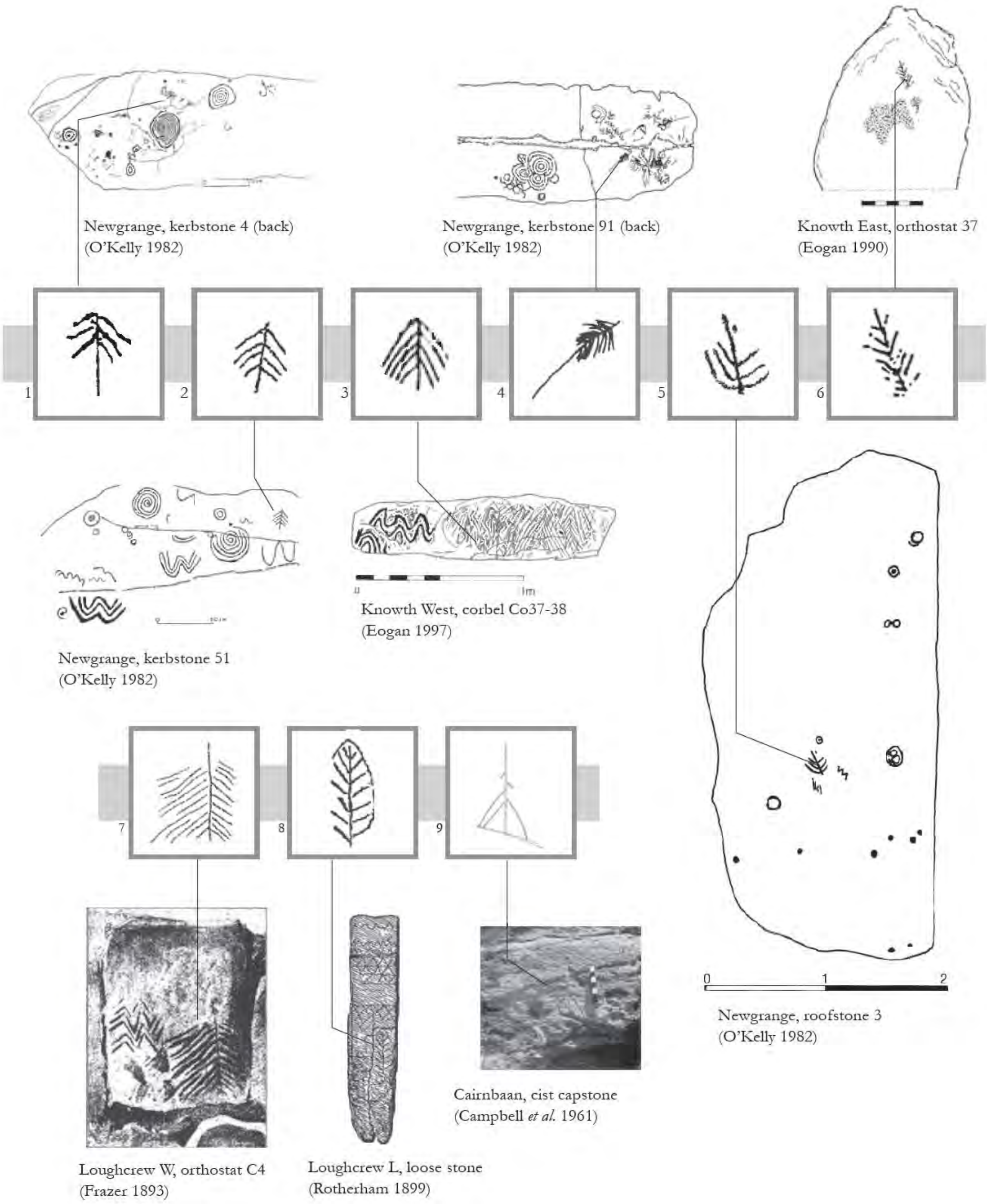


Figure 5.18: 'Possible naturalistic 'arboriform' motifs in Irish megalithic art (Robin, 2009: Fig. 63.)

'arboriform' category, although the former in particular may be typologically more abstract. The occurrence of arboriforms in painted rock art may have continued into the 3rd millennium BC and they also occur on some Beaker ceramics (often associated with possible solar motifs and/or representations of deer) and possibly on associated material culture (Salmerón Juan and Teruel

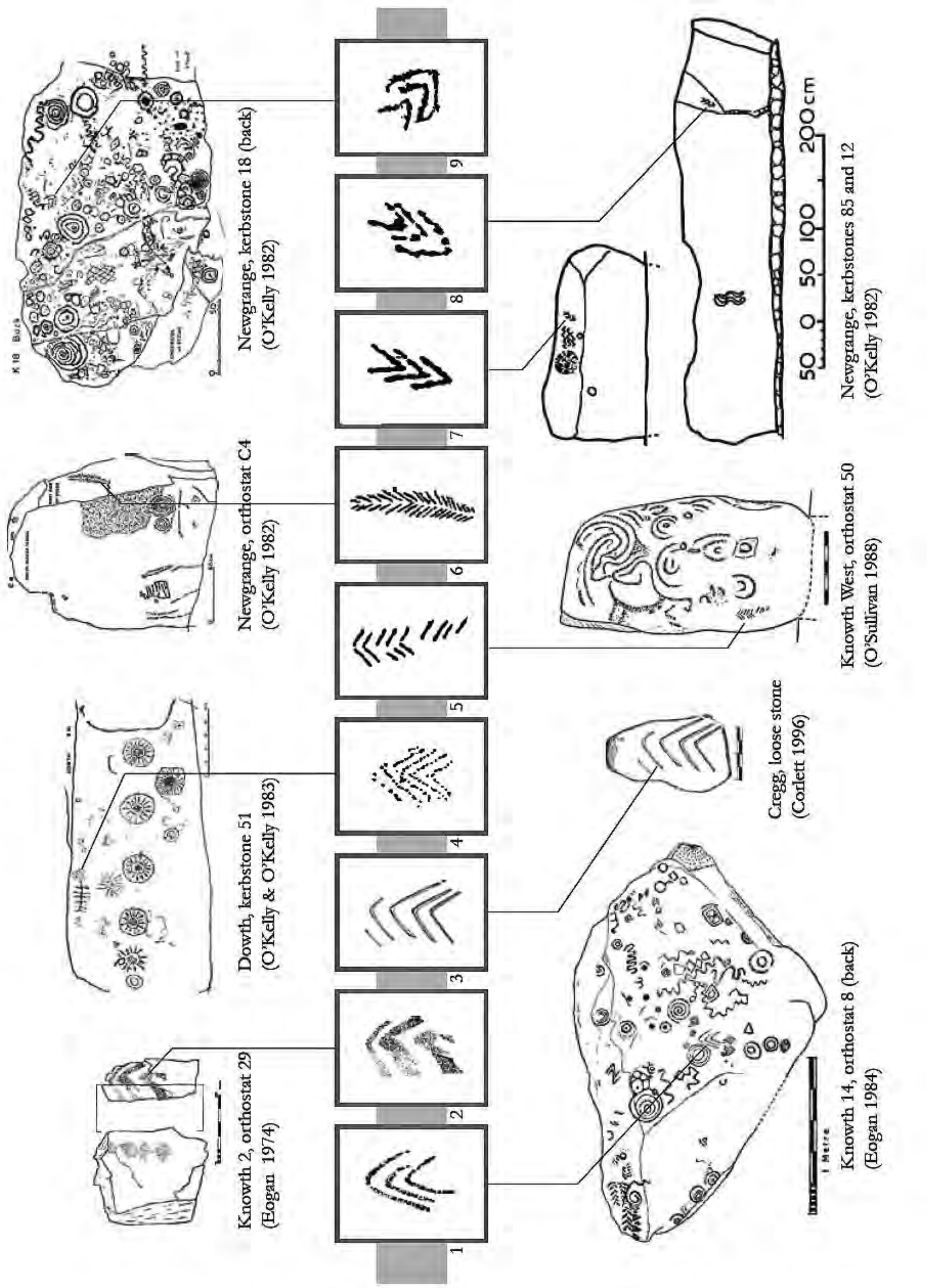


Figure 5.19: Possible abstract 'arboriform' motifs in Irish megalithic art. (Robin, 2009: Fig. 62.)

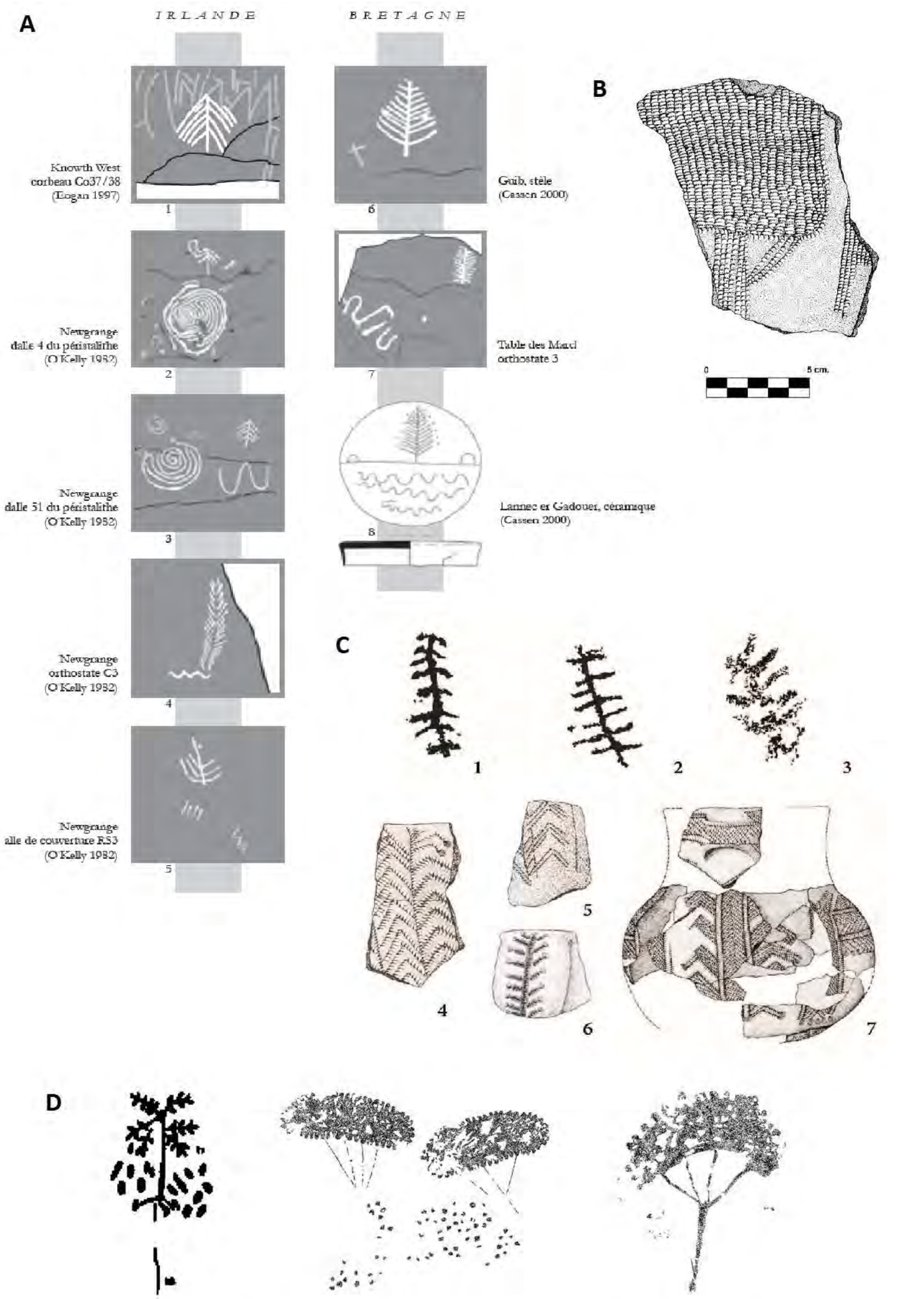


Figure 5.20: 'Arboriform' motifs in Ireland, Brittany and Iberia. (A) Associations of 'ramiform' and serpentiform motifs in Irish and Breton megalithic art (Robin and Cassen, 2009: Fig. 2.); (B) Naturalistic tree depiction on Cardinal pottery sherd from Iberia Cova de l'Or, Alicante (Spain) (Hernández Pérez, et al., 2007: Fig. 19.); (C) Ramiform motifs in art (1-3) and on pottery (4) from Alicante (Spain). 1: Abric II de La Sarga; 2: Abric II del Barranc de Frainos; 3: Abric I del Racó del Pou. 4: Cova de l'Or (Hernández Pérez, 2014: Fig. 12.); (D) Naturalistic tree depiction in 'Lavantine style' art. Left to Right: Doña Clotilde (Albarracín, Teruel); La Sarga, Abric I (Alicante); La Sarga, Abric II (Alicante) (Hernández Pérez, et al., 2007: Fig. 13.)

Juliá, 1990; Garrido Peña and Kenia Muñoz López-Astilleros, 2000: 289-294; Wintcher, 2011: 57, fig. 3.3a).

In the Irish repertoire of megalithic art, nine figurative 'arboriform' motifs have been identified (Figure 5.18), these occurring at Newgrange (rs3, c3, k4, k51, k91), in Knowth 1 east (c37/38) and west (orthostat c4), in Loughcrew W, and on now lost stone from Loughcrew L. In addition, the rowed v's or chevrons which occur on orthostat c3 at Newgrange has also been included in this category (Robin, 2009: 100-103, 2012: 144-145), but it is debatable whether all of the 11 somewhat comparable motifs represent similarly abstract variants (Robin, 2009: 100-102). The abstract 'scalariform' or 'ramiform' motif variants are more widespread with 40 specimens occurring (Figure 5.19), including nine directly associated with possible solar symbols (Robin, 2009: 76-77, 133; Robin, and Cassen, 2009: 854-855). However, as discussed above (5.4.1) it is feasible that some of these 'scalariform/ramiform' motifs may represent boat-symbols rather than being related to 'arboriform' depictions, but such interpretations remain open to debate.

5.5.1.5 'Idol' Symbols

The varied 'idol' forms incorporating the 'oculos' motif (c. 3500-2700/2500 BC), which is in itself suggestive of a 'double-sun', appear to have a symbolic connection with 'bow' and 'arboriform' symbolism. The 'facial tattoo' and 'eyebrow' motifs, are often included within the broader 'ramiform' category of symbols in "schematic" rock art (Salmerón Juan and Teruel Juliá, 1990 143-144; García Atiénzar, 2004: 226-230; Gómez-Barrera, 2005: 29-36; Wintcher, 2011: 28, 31, 57, 180-184; Hernández Pérez, 2014: 148) and it could certainly be advanced that the 'eyebrows', occurring over double suns, could be suggestive of double bow symbolism, i.e. the milky way of night and rainbow of daytime. However, certain variants of this motif are perhaps more reminiscent of the 'mushroom-shaped' symbol of Scandinavian art, so in such instances invoking an 'arboiform' and/or lotus/lily/ivy connotation may be more appropriate.

There is however an undoubted anthropomorphism to these motifs and they are certainly employed to represent or evoke faces across Iberia (Figure 5.21) on plaques (Salmerón Juan and Teruel Juliá, 1990: 145; Lillios, 2002: 141, 2004: 129, 131, 136-137, 147-148; Hurtado, 2008: 3; Lillios, and Thomas, 2009: 138-144; Thomas, 2009: 72-74; Thomas, et al., 2009: 54; Bueno Ramírez, 2010: 47-52), cylindrical objects (Salmerón Juan and Teruel Juliá, 1990: 144-145; García Atiénzar, 2004: 227-230; Hurtado, 2008, 4-6, 2010: 139-144, 153, 157-160, 163), ceramics, and unquestionably anthropomorphic figurines (Hurtado, 2008: 6-8, 2010: 172-181). In addition the 'facial tattoo' was also utilized on statue-menhirs in southern France (Peeters, 2005: 289-290, 310; Scarre, 2008: 81-84). It has been debated whether these various objects represent actual

Figure 5.21: Selection of varying 'ocular idol' type represenations. (A) Examples of typical Iberian 'ocular idol' (oculados) motifs. 1: Abrigo del ídolo; 2: Abrigos de los ídolos; 3: Canalivo el rayo; 4: Cueva de Las Enredaderas; 5: Collado del Guijarral; 6: Cueva de la Diosa Madre; 7: Abrigo del Santo Espíritu; 8: Penya Escrita de Tàrbena (García Atiénzar, 2004: Fig. 2.); (B) Iberian 'ocular idol' (oculados) motifs on mobile artefacts (García Atiénzar, 2004: Fig. 5.); (C) Anthropomorphic figurine from Llerena, Badajoz (Spain) with 'facial tattoo' (Hurtado, 2010: Fig. 16.); (D) Examples of Iberian plaque-idols from the Anta da Horta, Alentejo (Portugal) with 'facial tattoos' (Bueno Ramírez, 2010: Lám. IX.); (E) Examples of statue-menhirs with 'facial tattoos' in southern France. Left: Saint Sernin-sur-Rance (Aveyron) (Scarre, 2008: Fig. 4); Right: Frescaty (Haute-Garonne) (Peeters, 2005: Fig. 2.) (E) Female figures from Los Organos, Jaén (Spain) with skirts and head(resses) or shoulder decorations reminiscent of 'ocular-idol' motifs (Wintcher, 2011: Fig. 2.9.)

people, in some instances zoomorphs, or deities (e.g. Lillios, 2004: 126-127, 147-148; Gonçalves, 2006: 489-490, 502, 505, 508-509; Lillios, and Thomas, 2009: 138-144; Thomas, 2009: 73-74; Thomas, et al., 2009: 54-55; Bueno Ramírez, 2010: 40-41, 70-72). The 'eyed idol' symbol and figurines certainly appear to have been in some way connected with expressing group identity or affiliation (Hurtado, 2010: 166-172, 179-181; see also Thomas, 2009: 73-74; Thomas, et al., 2009: 54-55), but in the case of Iberian plaques for example, the widely accepted theory that they expressed genealogical lineage affiliation (Lillios, 2002, 2004) has recently been disproven (García Rivero and O'Brien, 2014).

Two (possibly female) figures depicted at the rock art site of Los Organos (Despeñaperros, Jaén) may provide a further clue to unlocking the meaning of the 'idol' symbol and figurines (Figure 5.21). Both of these figures wear distinctive head and shoulder decoration which evoke the 'eyed idol' motif (Wintcher, 2011: 31). In the current authors opinion it would be highly unlikely that these costumes were intended to represent living or deceased individuals, suggesting that a connection with deities may be more reasonable. Furthermore, the depiction of figurative anthropomorphic figures may be accomplished through the combination of other meaningful motifs (Hensey, 2010: 182-185, 2012: 168-169, 171; Robin 2012: 143) and this may lead to a duality in such representations. For example, on one level the face with 'tattoo' and lunula-type necklace as depicted on staute-menhirs in southern France may represent just that, a face and necklace. However, returning to the interpretive suggestions outlined above, on a more symbolic level the motifs employed may represent a solar boat above which an 'arboriform' is flanked by a 'double-sun', recalling elements of 'solar journey' symbolism, which it could be argued lends additional support to interpreting the 'eyed idol' symbol as representations of deities and facial 'tattoos' (or paint) as expressions connected not only with group but also "religious" affiliation.

5.6 Horses and the Sun

The concept of horses drawing the solar chariot is prominent in Greek and Indian Vedic mythologies. For example, in the Rig Veda a horse brought the reincarnated sun back to earth every morning. The Continental horse-goddess Epona and her Irish and Welsh equivalents (Macha and Rhiannon) were associated with the land and fertility and appear to have been venerated as protectors of horses and guarantors of prosperity and abundance (Green, 2002: 187-190, 204-207; Waddell, 2014: 89-90). However, horses do not appear to have gained ceremonial importance until the 2nd millennium BC, so will only be considered briefly. Currently available evidence indicates that following initial domestication in the Russian Steppe during the mid-4th millennium BC, domestic horses became more widespread across Europe in the later stages of the

3rd and particularly during the course of the 2nd millennium BC (Jansen, et al., 2002; Lindgren, et al., 2004; Outram, et al., 2009; Bendrey, 2012; Bendrey, et al., 2013). Their elevation to the position of prestige animals and liminal agents and associated integration into mythologies across Eurasia, and more specifically Europe appears to have followed the spread of the two-wheeled chariot c. 2000 BC (Westerdahl, 2009; Witzel, 2012: 267, 287, 394-395).

5.6.1 Horse Depictions

The occurrence of possible horse depictionsoin a small number of Portuguse megaliths and the deposition of seven horse skulls in Mané Lud in Brittany (Bueno Ramírez and de Balbín Behrmann, 2006: 98) could represent particularly early (post-Palaeolithic-Mesolithic) examples of equine prestige or cosomological significance in western Europe. However the absence of direct dates and the uncertainty surrounding the identification of the Portuguese horses, such a designation remains tenuous. The earliest two-wheeled chariots yet recorded in burial contexts occur in the Volga-Ural area of the Russian Steppe, where dates as early as c. 2800 BC have been recorded (Kuznetsov, 2006) and continue to occur in such contexts throughout the Bronze Age (Anthony, 1995; Pogrebova, 2003; Harrison, 2004: 148). The horse-drawn Bronze Age Trundholm chariot from Denmark (described above) represents a reliable example of equine integration into the cosmological sphere and it has been interpreted in terms of the daily solar journey across the sky and under the sea/earth (Kaul, 1998: 30-35, 2014; Goldhahn, 1999: 90; Kristiansen and Larsson, 2005: 294-296; Kristiansen, 2012: 74; Witzel, 2012: 287). A similar cosmological relationship between horses and solar-ships has also been recorded in southern Scandinavia where they are associated on both rock-art panels and bronze razors (Figure 5.1, Figure 5.22; Kaul, 1998, 2013b, 2014; Goldhahn, 1999: 87-92; Kristiansen, 2012: 74). It has also been advanced (Bradley, 2006: 381) that in Scandinavia the same ideas may have been further expressed in rock-art depictions of (generally) horse-drawn 'wheeled vehicles', which on occasion have wheels that resemble wheel-crosses. In contrast to the solar-boats these are usually found away from the shoreline in agricultural and inland situations (Gelling and Ellis Davidson, 1969: 14-21; Bradley, 2006: 376, 385). It may be advanced that these evoke a connection with the fertility of the land. As such, it may be proposed that these 'vehicles', which recall the Trundholm chariot (Figure 5.22), link the daytime portion of the sun's daily journey with the yearly solar cycle and its connections with land fertility. In Iberia depictions of two-wheeled 'vehicles' (a number of which include representations of horses), similarly interpreted as 'chariots', dating to the second half of the 2nd millennium BC (and possibly the first half of the 1st millennium BC) have been recorded among the rock-art motifs of Extremadura (Collado Giraldo, 2009, 2015), on numerous examples of the so-called 'warrior stelae' (Harrison, 2004: 144-151; Mederos, 2008) and at Valcamonica in northern Italy

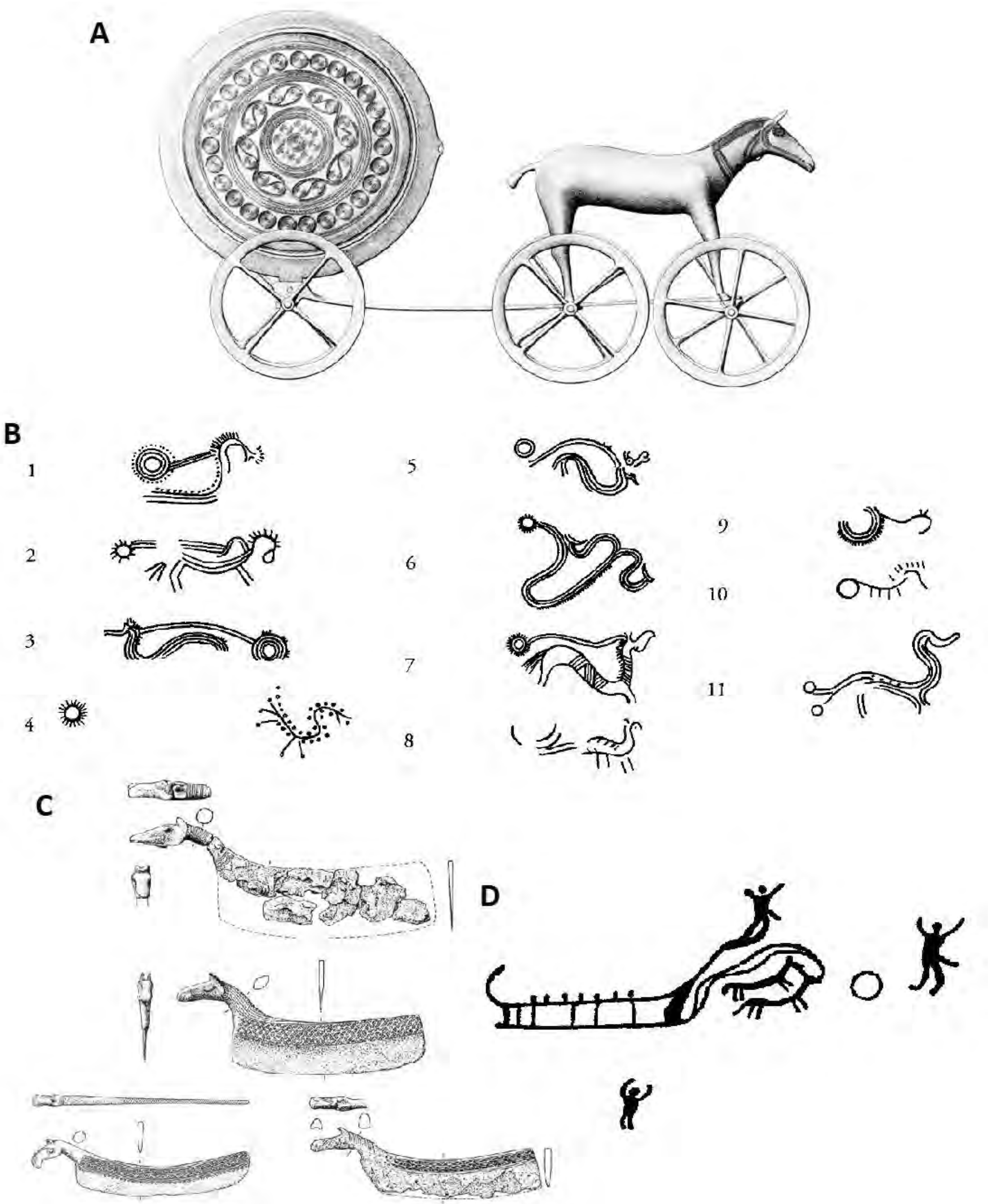


Figure 5.22: Selection of horse depictions. (A) The Trundholm 'chariot of the sun'. The gilded face of the bronze sun disc is mainly decorated with concentric circle motifs (Waddell, 2012: Fig. 3.); (B) The 11 sun-horses on Danish razors (no scale). 1: Åtte, Ribe; 2: Vester Lem, Viborg; 3: Ketting, Lolland; 4: Vandling, Hadersiev; 5: Vestrup mark, Alborg; 6: The Skive-district, Viborg; 7: Neder Hvolris, Viborg; 8: Torslev parish, Hjerring; 9: Denmark; 10: Asferg, Randers; 11: Denmark (after Kaul, 1998: Fig. 131.); Razors from Zealand (Denmark) with horse-headed handles. Top: Ubby; Middle: Darup; Bottom Left: Kartstrup; Bottom Right: Petersdat (Kaul, 2013b: Fig. 4.); (D) Drawing of a rock-carving ship being towed by two horses from Östergötland (Sweden) (Kaul, 1998: Fig. 134.)

(Anati, 2008: 30-34, 2009: 958). Two-wheeled chariots spread around the Near East and the Aegean during the early centuries of the 2nd millennium BC. It has been advanced that these

Aegean vehicles may have been the source of inspiration for those documented pictorially during the Later Bronze in Iberia (Harrison, 2004: 148-149). In Central Europe four wheeled horse-drawn 'wagons' began to appear in graves around 1300 BC (Pare, 1992, 2004; Harrison, 2004: 150-151).

5.7 Birds and Varying Connotations

Bird's ability to fly predisposes them to serve as symbols of the relations between the sky and the earth and water birds to connections between sky, land and water. Throughout Europe migratory birds are associated with the cycle of the year and particularly the return of spring and fertility to the land. For, example, this connection is apparent in the Germanic motif of migratory storks delivering the breath of life to children (Roque, 2009: 101-102) and within Slavic and Finno-Ugric folklore where migratory birds winter in the otherworld with the souls of the dead and return them to this world in spring (Zvelebil and Jordan, 1999: 118-119; Mencej, 2004; Golubkova, 2007). A similar connection with the yearly solar journey is also present in Greek mythology where Apóllōn (Roman Apollo), the god of light who was born on the winter solstice, flew his swan-drawn chariot to the island of the Hyperboreans for the months of darkness before returning in spring (Bondár, 2012: 89). Birds were considered to symbolize souls in ancient Egypt and Mesopotamia (Roque, 2009: 99) and throughout Celtic mythology birds (the swan, crow or raven in Ireland; crane or heron in Gaul; goose in Britain; raven in Germany) act as intermediaries with the Otherworld, and messengers or assistants of deities (Green, 2002: 171-181; Anderson, 2008; Roque, 2009: 98; Waddell, 2014: 49). Across northern Eurasia the Milky Way is referred to as the 'path of birds' ('path of cranes', 'birds path', 'trace of the route of birds', etc.) and this is sometimes seen as a variant of its identification as the 'route of dead souls' (Gibbon, 1972: 236-237; Kuperjanov, 2001; Berezkin, 2010: 13-15; Witzel, 2012: 38, 40). Associations of the Milky Way with the 'way of the souls' is also present among the traditions of such groups as Germanic, Polish, Russian, Ukrainian, and Finno-Ugric peoples (Gibbon, 1972: 238). As seen within the folk traditions of peoples speaking Baltic, Finno-Ugrian (but excluding Samoyeds) and Turkic languages (excluding those of the Sayan-Altai region) the 'path' is customarily associated with migratory birds such as geese, ducks, swans and cranes (Gibbon, 1972: 236-237; Berezkin, 2010: 13-15). It is also notable that white swans feature prominently in some versions of the daily solar journey myth, as for example they draw the chariots of both Indian Uṣāḥ and her brothers the Ashvins (Kristiansen and Larsson, 2005: 307-308).

An additional mythological connection between birds and the dead is apparent in the various bird-like female deities 'of death' found in Greek and Roman traditions and 'of death in war' present in the Germanic and Celtic areas (Egeler, 2009, 2013). Underlying common heritage has

	Ireland	Germanic	Iberia	Etruscan	Roman	Greece	Greece	Greece	Greece
	The Bodb	The Valkyries	Celtiberian Vultures	Vanth	The Furies	The Erinyes	The Keres	The Harpies	The Sirens
Female 'Demon'	X	X	X	X	X	X	X	X	(rare male Sirens)
Death	Rejoicing over bloodshed	'choosers of the slain'	Feeding on slain heroes	Appearing in scenes of death	Gatekeepers of the place of the netherworld	Beings of the netherworld	Synonym for perdition	Snatching away to the netherworld	In funerary context
Birds	Hooded Crow	Crow or Swan	Vulture	Winged	Winged	Winged	? cf flying	Winged	Half bird, half woman
Devouring	Red mouthed; severed heads as mast	? cf. parallels to associations with devouring beings	Feeding on slain heroes	-	-	Drinking the blood of their victims	Drinking blood of slain warrior	? cf hungriness in the Aeneid	Devouring their victims
Transition to Realm of the Dead	-	Fetching slain heroes	Carrying to heaven by feeding	Guiding the dead to the netherworld	Gatekeepers of the place of punishment in the netherworld	Dragging to hades; leading souls to punishment	Dragging to Hades	Snatching to the netherworld	Carrying souls to Xanthos
War	'goddess of battle'	Deciding victory	Restricted to martial heroes	In scenes of violent death	Handing victims over to Mars	In later literature on battlefield	Appearing in battle scenes	-	Knowledge of Trojan War; in combat scenes
Marked Sexuality	Sexual favours from heroes	Mating with dead and dying heroes	-	Nudity; exhibition of pudenda	-	-	-	-	'Voice of (sexual) desire'

Table 5.4: Summary of central traits of Irish, Norse and Mediterranean female 'demons' associated with death (Egeler, 2009: Fig. 5)

been argued for those found in north-western Europe by numerous scholars (e.g. Gulermovich Epstein, 1997, 1998; Ellis Davidson, 1988: 97-100) and the possibility of prehistoric (Bronze Age or even Chalcolithic) derivation from a Mediterranean/Aegean (or other mutual) source has been hypothesized (Egeler, 2009, 2013). The common characteristics of the figures identified by Egeler (*ibid*.; see Table 5.4) include performing a role in the passage of the deceased to the realm of the dead. In Irish mythology these figures are collectively referred to as the 'Bodb' and appear variously as the Bodb, Némain, Macha or the Morrígan/Anann, the latter being a by-name (or aspect) of Bóinne who herself displays connections with Milky Way symbolism (see: Chapter 6).

5.7.1 Avian Imagery

The inclusion of unworked bird bones, particularly wings, in burials appears to have occurred across Northern Europe throughout the Mesolithic and Neolithic periods. Currently the oldest example (grave VIII) at Popovo, Karelia, Western Russia is dated to c. 9300-9200 BC (Oshibkina, 2008: 58, 60). In the same region at Yuzhniy Oleniy Ostrov, bird bones deriving from shoulders, wings or legs have also been recroded in burials (c. 7000-6200/6000 BC) (Mannermaa, et al., 2008; Mannermaa, 2013: 196-199) and wing bones, some of which may have served as garments decorations, occur in a number of burials dating to between the mid-6th and mid-4th millennium BC at Zvejnieki in northern Latvia (Mannermaa, 2008: 205-208, 2013: 193-195). Although relatively rare, contemporary (late 5th to mid-4th millennium BC) burials containing unworked bird bones have been recorded on Zealand in Denmark (Albrethsen and Brinch Petersen, 1976), south-western Estonia and south Finland (Mannermaa, et al., 2008: 4). Avian imagery, most notably swans (Figure 5.23; including swan-elk hybrids and swan-human anthropomorphs), is particularly

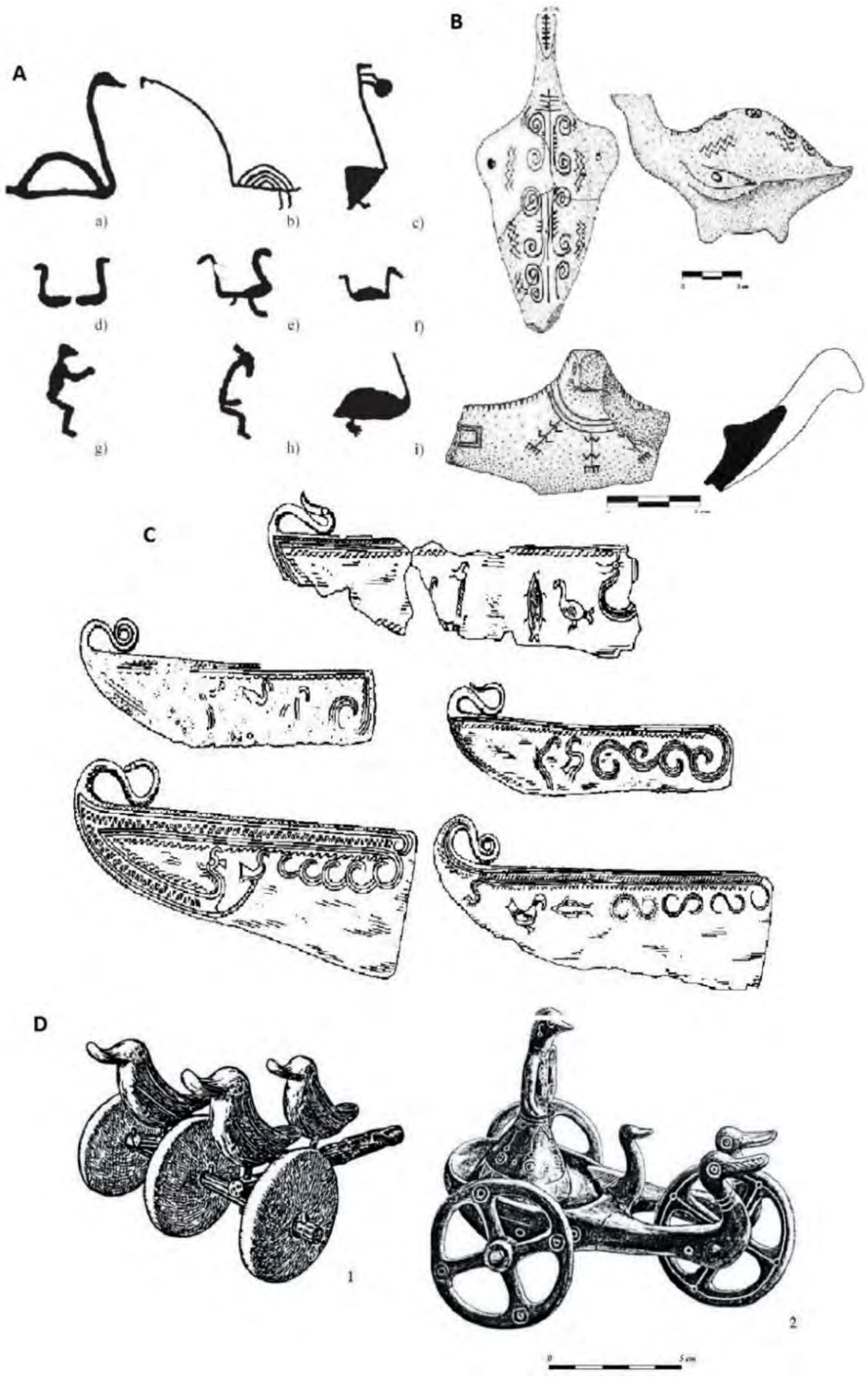


Figure 5.23: Selection of avian imagery. (A) Ambiguous swans from various Lake Onega localities (no scale). (a) a relatively 'naturalistic' swan; (b) a 'striped' swan with an impossibly long neck; (c) a long-necked swan with a 'solar symbol' attached the neck; (d–f) 'double water-birds'; (g–i) human-swan therianthropes (Lahelma, 2012: Fig. 2.6.); (B) Top: Bird-shaped rattle from Zagyvapálfalva (Hungary); Bottom: Rim fragment of a bird-headed bowl from Pákozd-Várhegy (Hungary) (adapted from Guba and Szeverenyi, 2007: Figs. 1, 5); (C) Swedish razors with ''complete" representations of birds whose beaks turn downwards. Top: Svarte Fiskläge (Skåne); Middle Left: Rönninge (Södermanland); Middle Right: Karpalund (Blekinge); Bottom Left: Tolagdrden (Västergötland); Bottom Right: Folkestad, Bohuslän (after Kaul, 1998: Fig. 164.); (D) Avian wagon models. 1: Brzeźniak (Poland); 2: Dupljaja (Serbia) (Bondár, 2012: Fig. 32.)

prominent among the rock art motifs (the majority of these probably dating to between the mid- or late-3rd to mid-2nd millennium BC) in the Onega area (Karelia) of Western Russia (Poikalainen, 1999; Stoljar, 2001: 105-108, 11l; Vieira, 2010: 255-259; Lahelma, 2012: 16, 27; Herva and Ylimaunu, 2014: 187-190). Bird representations appear rarer elsewhere in the Fennoscandian tradition (Helskog, 2004), but do for example occur in the earlier phases (c. 4200-2700 BC) of art at Alta, northern Norway (Helskog, 1987: Fig. 3.2; 2004: 273-277). Occasional bird bones have been discovered in north European burials of later 4th or 3rd millennium BC date including an example in southern Finland (Mannermaa, 2003: 15) and two on Gotland, Sweden (Mannermaa, 2008: 205, 207).

Avian imagery and symbolism appears relatively rare among the regional artistic repertoires of Western Europe, occasional bird representations occur in France and Iberia. In the case of the latter, unambiguous birds have been identified on rock art panels at (at least) five sites (Gómez-Barrera, 2005: 29; Wintcher, 2011: 4, 186). In the French megalithic tradition, the most unambiguous example is a currently unique depiction of a wood pigeon, crow, or raven on the menhir of Men Bronzo (Morbihan) in southern Brittany (Cassen, 2005: 201-202, 2007: 225, 2011: 16). In addition to this example, Cassen (2007: 224-225, 2011: 15-16) has argued that the so-called 'yoke' or 'horned U' motif actually represent "double-birds" (i.e. two birds in profile joined at the tail on the water), comparing the Breton motif to representations at Onega (Figure 5.24), but suggested they could alternatively depict simplified birds in flight (Cassen, 2005: Fig. 6, 2011: 15-16). This motif has been recorded at both Mané Lud (ortostats 1A, 6, 17, 19) (Shee Twohig, 1981: 53; Cassen, 2011: 20-21, 25-34) and Gavrinis (C2, C4, RS2) (Shee Twohig, 1981: 53; Le Roux, 1992: 98) in the Morbihan area. Further west on the islands of Orkney in Scotland the Isbister Chambered Cairn which is situated above the South Ronaldsay cliffs contained a series of deposits dating to the first half of the 3rd millennium BC and into the Chalcolithc (c. 2400 BC) and possibly up until the Early-Middle Bronze Age transition (c. 1600 BC) the included bones from a variety of bird species (including 14+ white-tailed sea eagles) (Hedges, 1984; Jones, 1998).

Hybrid female-bird figurines, which may depict women wearing 'bird masks', dating from the 6th and 5th millennia BC are found in parts of Eastern-Central and South-Eastern Europe (Gimbutas, 1984: 133, 137, 139, 1989: 26, 35, 194; Marler, 2003: 8) and as far west as Italy (Brea, et al., 2010: 130), where bird figurines and ceramic vessels featuring anatid headed handles also occur (*ibid.*: 132, 139). In the Cucuteni (Tripolye) culture (c. 4500-3000 BC) of Ukraine and Romania water birds with long legs and necks are depicted on vases and in clay figurine form (Gimbutas, 1984: 125). Water-bird shaped askoi vases are first found in the Balkans during the 6th to mid-5th millennia BC (*ibid.*: 106, 136, 138) and appear in the Carpathian Basin in the 3rd millennium BC,

Figure 5.24: Depictions of boats with bird-head protomes. (A) Representations of Anatidae shown, rump to rump, on the water on rock outcrops on Lake Onega, Karelia (Russian) (Cassen, 2011: Fig. 1.); (B) Comparative motifs from Mané Lud (Brittany); Left: Orthostat 17 (Cassen, 2011: Fig. 2.); Right: Orthostat 1A (Cassen 2011: Fig. 7.); (B) Bronze 'wheel cross' pendants featuring possible schematic boats. 1 Včelince (Slovakia); 2-4: Nagyhangos (Hungary); 5: Oszlár (Lower Austrtia); 6: Tolnanémedi (Hungary) (adapted from Hänsel, 2012: Abb. 3.); (C) Bronze pendants from the Carpathian Basin featuring 'wheel crosses' and boats. Locations not incuded in original. (adapted from Pásztor, 2011: Fig. 5.); (E) Anthropomorphic boat-shaped pendants. Top: Vače (Slovenia); Middle: Santa Lucia/Most na Soči (Slovenia); Bottom: Paularo, Carnia (Italy) (Giumlia-Mair, 2008: Figs. 6-8.); Solar-boats depicted on bronze sheet objects from Hungary. Locations not incuded in original. (Hänsel, 2012: Abb. 2.)

beginning c. 2700-2500 BC and continue into the earlier 2nd millennium BC (Guba and Szeverenyi, 2007). In addition, avian-shaped pottery vessels including deep bowls with bird head protomes, vessels with lobes forming stylized bird heads, and bird-shaped clay rattles (Figure 5.23) occur in the region throughout the 2nd and into the first centuries of the 1st millennium BC (c. 900-800 BC) (*ibid*.). Beyond the Carpathians, a large number of bird-shaped vessels and rattles are also known from Lusatian and Wysocko style assemblages (1300-500 BC) in Eastern Germany, Poland and parts of the Czech Republic and Slovakia (*ibid*.: 81, 84-85).

Bird-shaped wagons first appeared in the Transylvanian area of Romania (c. 2200-1600/1500 BC), including an elaborate model from Ciceu Corabia. Another notable early example comes from Böheimkirchen in Lower Austria (c. 1800-1500 BC) (Bondár, 2012: 84, 86), as are the slightly later (c. 1500-1400 BC) pair of ceramic 'wheeled vehicles' driven by bird-headed females (one drawn by three birds) from Dupljaja in Serbia (in the Carpathian Basin) (Figure 5.23; Pásztor, 2011: 137-138; Bondár, 2012: 86). A later (c. 1100-900 BC), but comparable bird-drawn clay model comes from Brzeźniak in Poland (Figure 5.23; Bondár, 2012: 86). Other examples dated to the second half of the 2nd millennium BC include two miniature bronze vehicles drawn by aquatic birds from Romania (Ionescu and Dumitrache, 2012: 158) and a cattle/bull-drawn bronze model from Eiche (Postdam) in Central Germany which features water-birds sitting on the frame (Harding, 1998: 322).

A series of bronze pendants from the Carpathian Basin (c. 1800/1700-1500 BC) have been interpreted as schematic solar boats with bird-head protomes above wheel-crosses (Figure 5.24; Hänsel, 2012: 109, 111-113). Similar symbols occur on some contemporary ceramics, in addition to being compared to the terminals of bronze belt-hooks and gold bracelets, as well being described as 'horns' and compared with 'spiral-volute' motifs (Figure 5.13, Figure 5.17; David, 2003a, 2003b, 2010: 460-461, 477). A definitive conclusion cannot be drawn, but the hypothesis that these represent schematic solar boats appears plausible. A number of solar-journey related motifs appear in a 'scene' on one of the domed gold discs from Grăniceri (Arad) in north-west Romania (c. 1700-1500 BC), which depicts two people engaged in intercourse, a bird and two (aroused) stallions (David, 2010: 454-455). Unequivocal boat-shaped bronze pendants with bird-head protomes (c. 1500-800 BC) have been recovered in north Romania, eastern Hungary, eastern Slovakia and eastern Italy (Figure 5.24; Guba and Szeverenyi, 2007: 91), while contemporary (c. 1100/900-700 BC) ceramic ships with bird-bead protomes have been recorded in western Italy (*ibid*.: 91-93). Moreover, the 'bird-ship' pendants from Marhañ, eastern Slovakia and Nádudvar, eastern Hungary (c. 1300-1200 BC) have multiple perforations, so were probably from composite ornaments and a similar piece from Jernhyt in Denmark may have been an import from the

Carpathian Basin (Kaul, 1998: 134; Guba and Szeverenyi, 2007: 91). Bird head motifs have occasionally been recorded on armour elements including bronze greaves from northern Italy and Croatia (c. 1300-1100 BC), cuirasses from eastern France (c. 1100-1000 BC) and crested helmets (c. 1100-800/700 BC) from the Cave of Flies in Škocjan (Divača) in Slovenia (Mödlinger, 2014: 22-23, 25-26). Decoration featuring solar-ships with bird-head protomes also occur on the hilts of solid-hilted bronze swords (c. 1100/1000-800 BC) from the Carpathian Basin (Guba and Szeverenyi, 2007: 90-91) and both contemporary bronze cauldrons and later amphorae (c. 800-700 BC) across Central Europe and Southern Scandinavia (Figure 5.24; Guba and Szeverenyi, 2007: 89; Waddell, 2012: 340-343, 2014: 38, 44-46). Contemporary avian-imagery has been recorded in the British Isles, a notable example being the representations of swans, cygnets and ravens on the bronze flesh-hook (c. 1050-910 BC) from Dunaverney, Co. Antrim (Bowman and Needham, 2007; Waddell, 2012: 347, 2014: 47).

5.8 Bovine Mythology

In Eurasia, the Milky Way is sometimes described as the ‘animal trail’ and in some traditions, such as that of the (Lower) Germanic area it is associated with cattle (note: the mythological importance of cattle will be discussed further in the following chapter; see: 6.3.2). Similarly, in Indian tradition the Milky Way is referred to as the ‘way of souls’ and in some cases cattle guide souls along this path to heaven. It has been suggested that this connection with cattle derives from the stars being equated to drops of milk. The motif of the Milky Way being formed from the milk from a goddess personified as a cow is widespread and found consistently across Europe and among the Buryat of Mongolian Siberia. It is further suggested that the association with cows lies behind the Greek and Roman legend in which the Milky Way was formed by milk spilled from the breast of Hera (Juno) when she tore it away from her son Heracles (Hercules). These connections may also be alluded to more generally in the Celtic world in the use of cattle as images of fertility and regeneration and in the Sanskrit term for stars, ‘gāvas’ which means ‘cattle herds of the sky’ (Gibbon, 1972: 238-239; Green, 2002: 220).

5.8.1 Cattle Symbolism

The symbolic importance of wild aurochs and subsequently domestic cattle emerged in the Near East and Anatolia during the Epipalaeolithic-Early Neolithic (c. 7000-6500 BC). They were depicted on the T-shaped pillars at Göbekli Tepe and bucrania were prominently displayed on the walls of structures at such sites as Hallan Çemi, Jef el-Ahmar and Çatalhöyük and early examples of cattle figurines have been recovered at PPN sites such as ‘Ain Ghazal and Aswad (McAdam, 1997; Meskell, 1998: 50; Goring-Morris and Belfor-Cohen, 2011: 68-69). At Çatalhöyük, hunting scenes

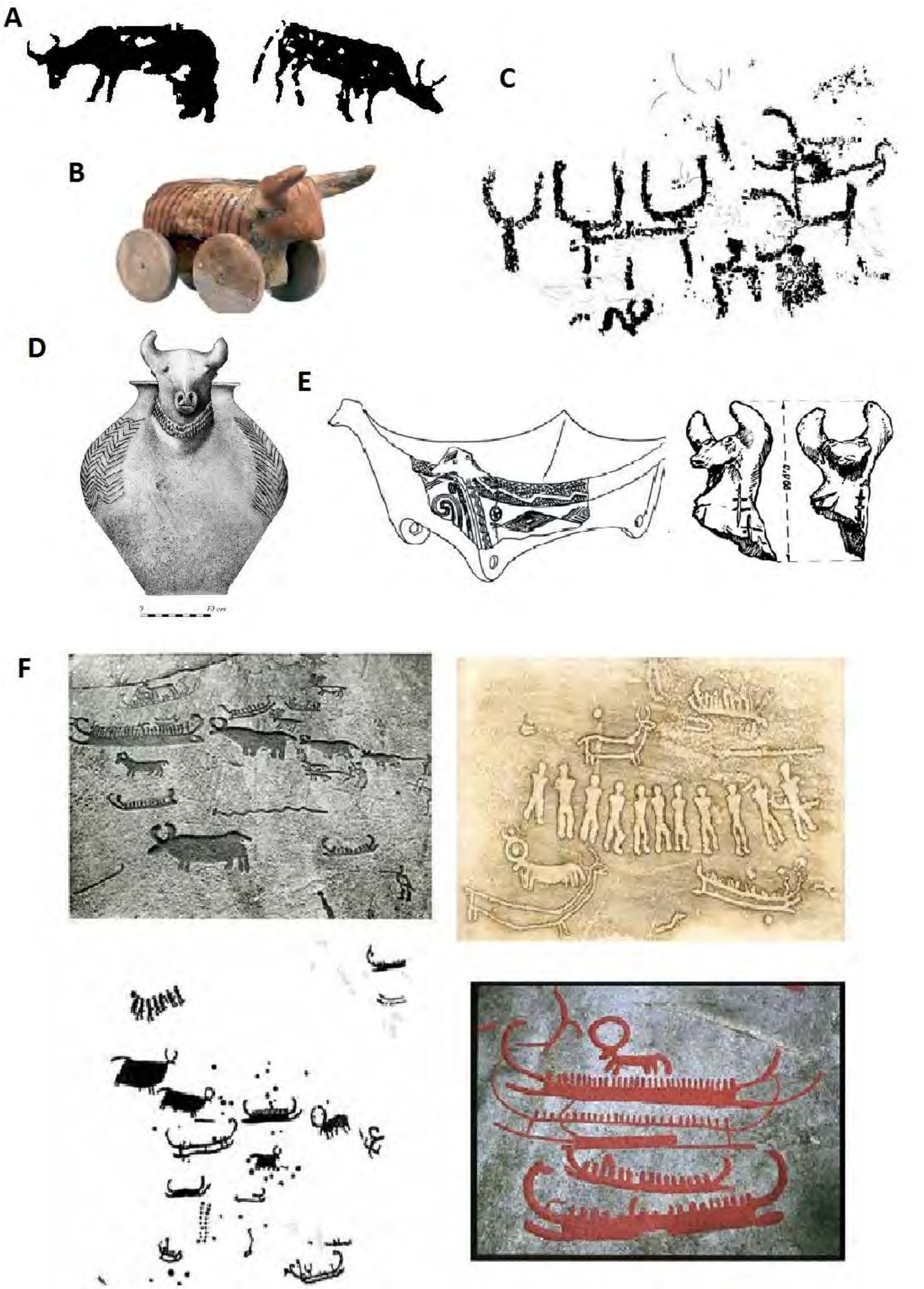


Figure 5.25: Selection of bovine representations. (A) Examples of Iberian Levantine style bull motifs (adapted from Wintcher, 2011: Figure 2.7); (B) Stylised Cucuteni–Tripolye wagon model (Bondár, 2012: Fig. 2.); (C) Example of stylized bovid plough team at Valcamonica (Italy) (Anati, 2008: no figure. number);; (D) Pottery vessel with a cattle head from Vác (Hungary) (adapted from Kővári, 2010: Fig. 5.17.); (E) Wagon models with cattle-head protomes. Left: Lechinţa (Romania); Right: Jigodin (Romania) (adapted from Bondár, 2012: Fig. 30.); (F) Bulls and ship depictions from Sweden. Top left: Tanum 12; Top right: Tanum 25; Bottom left: Tanum 351; Bottom right: Kville (Ling and Rowlands, 2015: Fig. 8.2.)

involving 'giant' aurochsen are also depicted, but it is unclear whether these were intended to represent real hunting expeditions, 'virtual hunts' or to illustrate mythological narratives (Guilaine and Zammit, 2005: 101-102). It may also be notable that it has been determined that dairying and milk consumption were established at an early stage in the Near East and spread across Europe as part of the 'Neolithic package' (Craig, et al. 2003; Vigne and Helmer, 2007; Duerr, 2007; Evershed, et al., 2008; Greenfield, 2010; Cramp, et al., 2014b). This suggests that a heightened symbolic importance and potential associations with the Milky Way may have already been established by the earliest Neolithic.

During the 6th and 5th millennia BC both cattle figurines and 'labrets' or 'bucrania' (i.e. horn amulets of clay, bone and stone) are found on earlier Neolithic settlements in the Balkans (Budja, 2003: 119-120; Nanoglou, 2008: 5). During the 5th millennium BC 'cattle-shaped' vases have been documented on LBK sites in Central and Cucuteni (Tripoly) sites in Eastern Europe (Gimbutas, 1989: 267; Figure 414). Although cattle representations appear less common in the Carpathian basin and Central Europe during the 4th millennium BC occasional depictions and figurines have been recorded on Baden culture and Cucuteni (Tripoly) sites (Gimbutas, 1989: 270-271; Kővári, 2010) and possible depictions of 'bull horns' (or alternatively boats) occur on pottery in the latter area between the late-5th and mid-4th millennia BC (Gimbutas, 1974: 91; Figs 49-51).

As is suggested for horses, it is feasible that the symbolic importance of cattle increased following the invention of wheeled vehicles and archaeological evidence indicates that wheels were known across the greater part of Europe and Anatolia from the mid-4th millennium BC (Vosteen, 1999: 42; Zich, 2006; Čufar, et al., 2010: 2031, 2034; Schlichtherle, 2010; Mischka, 2011; Bondár, 2012: 17-19, 23-27). Clay models of 'wheeled vehicles' from the Carpathian Basin (including Hungary and Romania) and Central Europe date from the Copper Age through to the Iron Age (see Bondár, 2012: 15-16 for references). Bondár (2012: 23-24) suggests that the earliest variant of wagon models is represented by a combination of wheels and the draught animal (cattle) which date to the earlier 4th millennium BC (Figure 5.25) and include numerous examples from the Cucuteni (Tripolye) culture in Ukraine and Romania. Neolithic petroglyph depictions of cattle-associated wheeled vehicles in Switzerland, Germany and Italy have been dated to the later 4th millennium BC (Vosteen, 1999: 42) and an incised depiction of a 'wheeled vehicle' featuring a possible solar-symbol has been recorded on a Funnel Beaker pot (c. 3650-3400 BC) from Bronocice in Poland (Kruk and Milisauskas, 1991: Fig. 3; Bakker, et al., 1999: 784, Fig. 7). Wheeled vehicles with cattle-head protomes (Figure 5.25) are rare, but examples have been recorded (in Slovakia and Hungary) within the Boleráz group (Kővári, 2010: 394; Bondár, 2012: 32). Occasional clay and copper representations of draught cattle have been also recorded in Central and Eastern Europe. In addition, cattle “burials” or “depositions” (3500-2000 BC) had a wide but largely northern distribution in Central/Eastern Europe encompassing parts of the Tiefstichkeramik, Funnel Beaker, Baden, Złota, Globular Amphora and Corded Ware cultures (Pollex, 1999; Horváth 2009: 116, 118-120, 2014: 524-525).

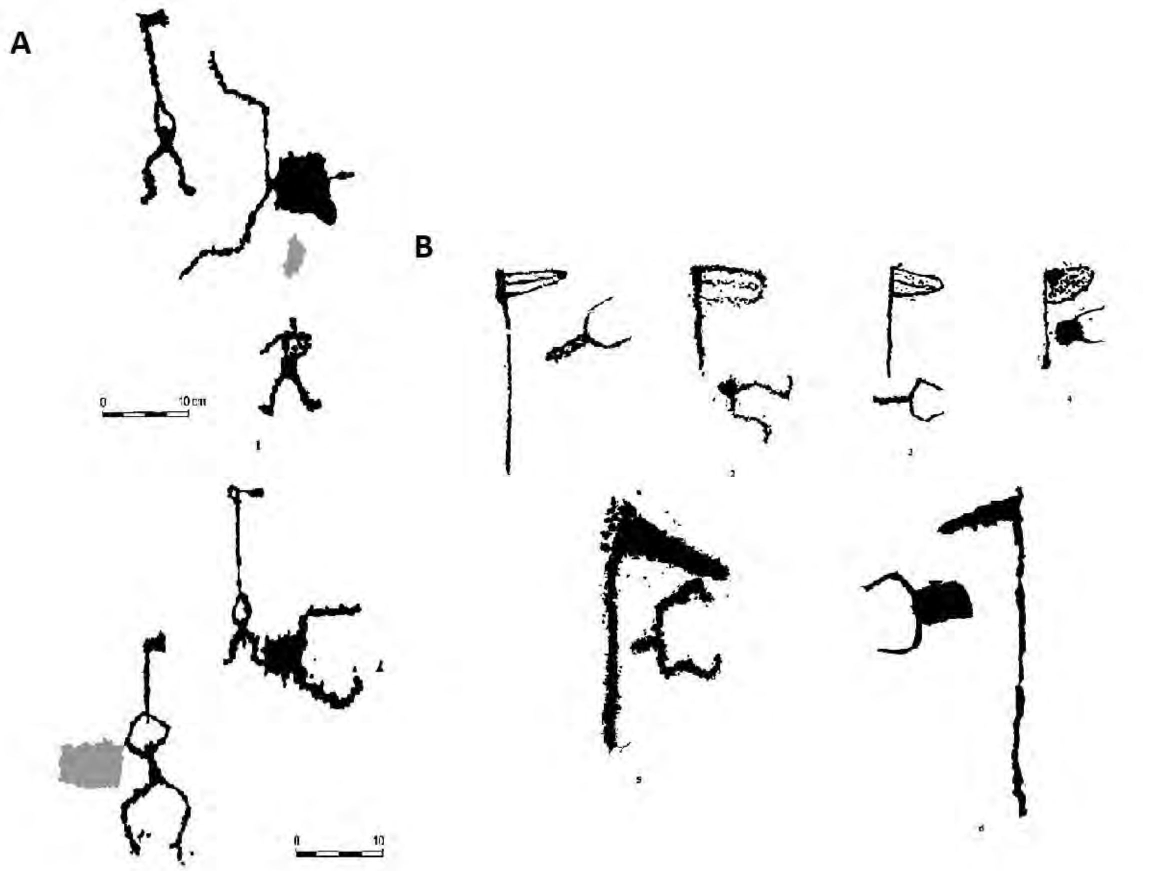


Figure 5.26: Schematic representations of ‘bull sacrifice’ at Mont Bego (France). (A) Examples of human figures with raised halberds and bucrania suggested to represent sacrificed cattle (de Lumley, et al., 2009: Fig. 21.) (B)Examples of halberds and bucrania suggested to represent sacrificed cattle (de Lumley, et al., 2009: Fig. 18.)

In France, a bovine with horns augmented by a pair of opposing crozier/crook/lacrosse symbols and a ram/goat featured on the menhir re-used at Gavrinis and the Table des Marchands (originally erected in the 5th and incorporated into the megaliths around the beginning of the 4th millennium BC) (Cassen, 2005: 202-203, 2012a: 1343-1344; Gaumé, 2007; Le Quellec, 2006: 701-702, 704). It has also been advanced that two of the five quadrupeds identified on the menhir of La Tremblais at St-Samson-sur-Rance (Côtes d’Armor) represent comparable animals (Le Quellec, 2006: 691, 702). It may also notable that a double cattle deposition dated to the 6th millennium BC occurred in a pit under the Er Grah long barrow, close to the Table des Marchands (Le Quellec, 2006: 712; Tresset and Vigne, 2007). Cattle representations (beginning c. 5600/5500-4500/4000

BC) are also relatively rare in Neolithic Iberia, but the back half of a bovine appears on a sherd of Cardinal pottery from the Cova de l'Or in Beniarrés (Valencia) (Mateo Saura, 2008: 8; Wintcher, 2011: 62; Hernández Pérez, 2014: 145-146) and several cattle (predominantly bull) representations feature within the 'Levantine' art style (Figure 5.25) of south-eastern Iberia (Gómez-Barrera, 2005: 29, 33; Wintcher, 2011: 4, 27-28, 68-69, 186-188). Cattle depictions, particularly those of plough teams, were a consistent feature of the rock art repertoire of Valcamonica (Figure 5.25) from the earlier stages of the 4th millennium BC (beginning c. 4000/3800 BC) through to the Iron Age (Anati, 2008: 17, 19-21, 27-33, 2009: 939). Depictions of four-wheeled vehicles drawn by cattle also occur in the region (beginning c. 2500-2400 BC), but these were replaced by horses in the mid-2nd millennium BC (Anati, 2008: 27, 30-31, 2009: 939, 943). Cattle symbolism, which also includes plough teams, is more diverse at Mount Bego (c. 3500-2000/1800 BC). As is the case with the earlier representations at Valcamonica, these are depicted as schematic 'corniforms' or 'bucrania' and include a variety of anthropomorphized variants (including "faces" suggested to incorporate both 'solar symbolism' and bovine connotations). In addition, there are cattle representations which are directly associated with halberds interpreted as representations of bull sacrifice (Figure 5.26) and associations with anthropomorphs, daggers and/or 'water channels' suggested to indicate connections with 'fertility' (Barfield and Chippindale, 1997; Thomas, 2003: 276, 282, 284-285; Magail, 2006: 97-98; Iglesias, 2008: 126-127; de Lumley, et al., 2009: 980-998).

Solar symbolism has been noted on 3rd millennium BC clay vehicle models from north-western Romania and eastern Hungary (Bondár, 2012: 75, 82) and there are further suggestions of symbolic connections between cattle and solar cosmology during the 2nd millennium BC. For example, during this period (c. 1600-1400 BC) iconographic representations of horns, pairs of bull heads and horned gods occur in many parts of the Near East and on the islands of Crete and Cyprus (Kristiansen and Larsson, 2005: 263, 330). In the Carpathian Basin a unique depiction of an ox or bull occurs on a gold axe (c. 1800/1700-1500/1400 BC) from Țufalău (Covasna) eastern Romania (David, 2010: 453). In the Scandinavian rock art region of Bohuslän in Sweden, representations of bulls were depicted in association with ship motifs (c. 1700-1500 BC), prior to the latter being associated with horses (Figure 5.25; Ling and Rowlands, 2015: 89-96). In addition, representations of anthropomorphic figures with horned helmets (c. 1200-800 BC) are a feature of western Swedish rock-art (Figure 5.27; Kristiansen and Larsson, 2005: 202, 275; Ling and Rowlands, 2015: 96) and these depictions are not dissimilar to the figures represented with horned helmets on Iberian 'warrior stelae' (c. 1400/1200-800 BC), which have been compared with Nuragic figurines (c. 1100-800 BC) from Sardinia (Figure 5.27; Harrison, 2004: 143; Ling and

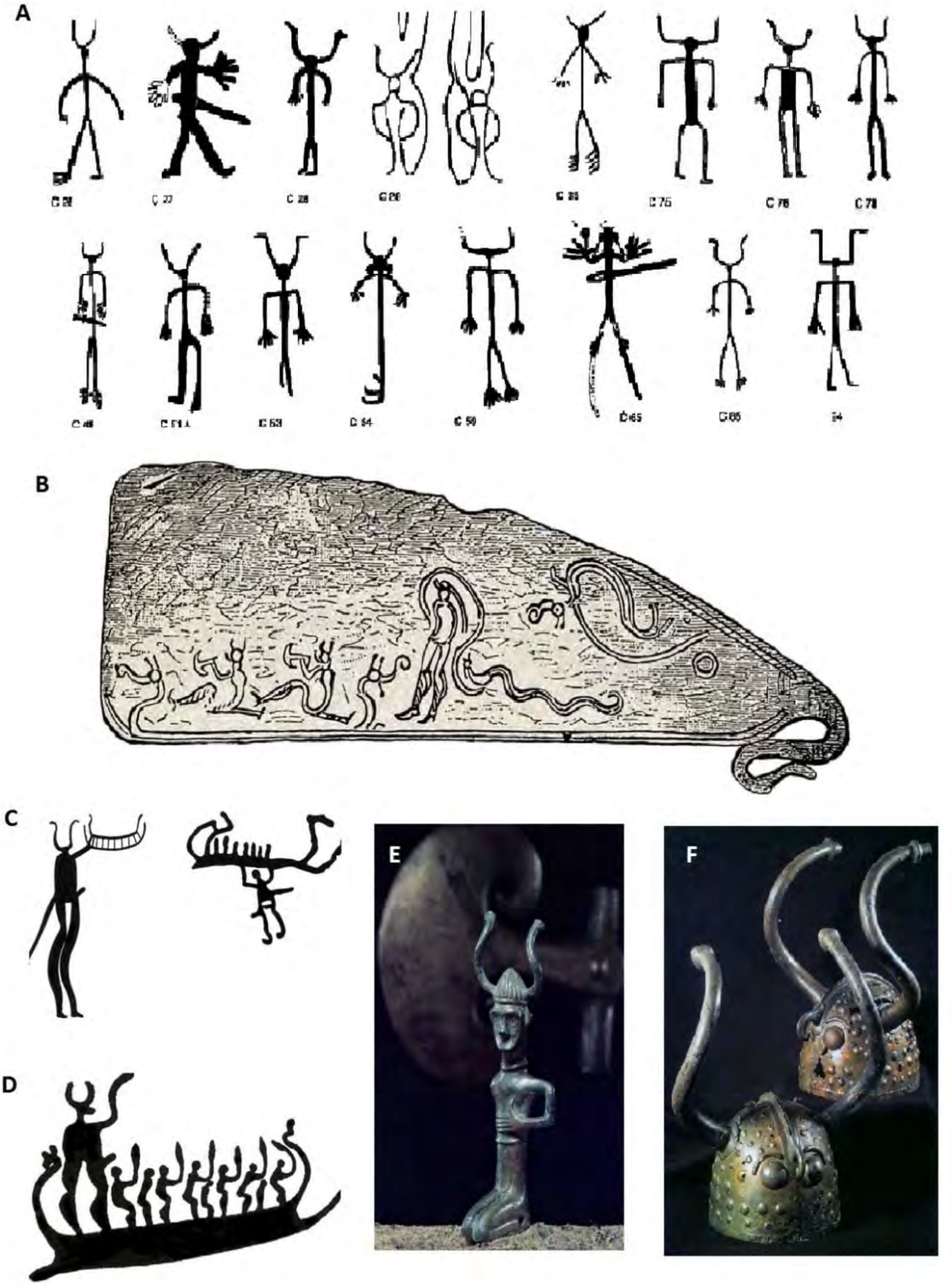


Figure 5.27: Examples of figures depicted with horned helmets and the helmets from Viksø. (A) Depictions of the human figures that are the central element in an Iberian 'warrior stelae' composition with horns attached to their heads (scaled to the same size) (Harrison, 2004: Fig. 7.13); (B) Axe-wielding 'twins' aboard a ship on a bronze razor from Vestrup (Germany) (Vandkilde, 2013: Fig. 4.); (C) Large figure lifting ship on rock art panel at Bohuslän (Sweden) (adapted from Vandkilde, 2013: Fig. 6A.); (D) Oversized 'warrior' aboard crewed ship on Tanum 325 rock art panel (Sweden) (Vandkilde, 2013: Fig. 6B.); (E) One of the twined figurines from Grevensvænge (Denmark); (F) The helmets from Viksø (Denmark) (Vandkilde, 2013: Fig. 1A.)

Rowlands, 2015: 101-102). Similar symbolism is also apparent in the pair of bronze figurines from the Stockhult hoard (Scania), southern Sweden (c. 1500-1300 BC) whose conical hats were probably mounted with horns, and the figurine pair from Grevesvänge in Denmark (c. 1000-900 BC) whose hats feature s-shaped horns (Kristiansen and Larsson, 2005: 274, 312, 333), which are similar to those on the pair of full-size bronze helmets from Viksø in Denmark (c. 1000 BC) (Figure 5.27; Kristiansen and Larsson, 2005: 333; Vandkilde, 2013). In addition, some paired anthropomorphic beings with horns/horned helmets (some possibly dating to as early as c. 1700-1500 BC) in Scandinavian rock art carry lurs (i.e. bronze horns), which have themselves been suggested to evoke bull horns (Kristiansen and Larsson, 2005: 202, 275). Pairs of actual lurs have also been recovered in Scandinavia, such as those from a bog at Bregninge (Zeeland) in Denmark, featuring spiral decorated plates covered with thin gold sheet (c. 1500-1300 BC) (*ibid*.: 266-267). Paired bronze horns (c. 1200-500 BC) have also been recovered from a number of bogs in Ireland and it may also be notable that a hoard from Boolybrien bog in Co. Clare included (along with a number of other objects) a pair of bronze axes and a bronze horn (Eogan, 1983: 65-67; Waddell, 2010: 245).

5.9 Inter-Realted Serpentiform and Marine Symbolism

As discussed above, a central theme of the Eurasian creation myth is the mating of the male heavens and female earth. Closely connected with this concept is the “creation of order”, and/or the fertilization of the earth so it can support life. This is achieved through the slaying of a (frequently) female aquatic beast by a personification of ‘solar power’, usually in the form of a bird or mythological ‘hero’ (frequently a descendant of the Skyfather). This trope is visible throughout Eurasian mythology, and is an essential element of “dragon-slaying” sagas (e.g. Olmsted, 1994: 66-67, 83-84, 201-206, 253-254; Watkins, 1995: 297-468; Shaw, 2006; Monette, 2008; Witzel, 2008; Leeming, 2010; Rappenglück, 2014). The aquatic animal may be variously described as a reptile (snake) often described as a ‘dragon’, a giant fish (commonly eel, octopus, or whale), ‘shell’, turtle or marine ‘chrimera’. The execution involves the slicing of the beasts “membrane”, conceived as its shell/skin or the destruction of the cave in which it dwells releasing the “primordial waters” and the sun (and/or other luminous objects) allowing it to rise to the heavens (Andrews, 1998: 207; Leeming, 2010; Rappenglück, 2014: 295, 299). As elaborated upon below, it may be advanced that this concept is underpinned by references to childbirth, as the membrane is punctured, the water released, the serpentiform umbilical cord severed, and the new-born ‘sun’ released. It may also be notable that in ancient Egypt, fish and birds are two manifestations of a star’s being, originating underwater, then transforming and ascending the sky, a concept perceived as analogous to a 'soul's' life-cycle (Altenmüller, 2005: 76; Rappenglück, 2014: 299).

In this context it is also notable that various goddesses associated with the fertility of the land and childbirth were connected with serpentiform symbolism. For instance, in Greek tradition Dēmētēr, associated with the cyclical fertility of the land, was also a goddess of childbirth and in Athens was known as "Cherisher of Children". In Arcadia the serpent was regarded as a symbol of Dēmētēr and this attribute has been linked to her underworld aspect (Olmsted, 1994: 75). The Scytho-Maeotian deity Argimpasa (the "Great Goddess") associated with animal husbandry, fertility, and celestial waters, was a tendril-limbed, half-woman and half-serpent. The fish-like minor Scytho-Maeotian deity Derceto, correlated with the later Greco-Scythian Aphrodite Ourania (mistress of "mighty waters") had comparable associations (Ustinova, 1998, 2005; Lincoln, 2014). Many Gaulish and Romano-British river Goddesses, including Sirona and Damona, typically associated with source temples (and variously with healing, re-birth, childbirth and gynaecological problems), possessed serpentiform attributes and were portrayed as handling serpents or eels (Olmsted, 1994: 182; Greene, 2002: 224-227).

In Indo-Iranian tradition the 'world tree' grows out of the cosmic waters and the sun-bird sits at the highest point and the aquatic serpent coils around its roots, signifying the polarity of the upper realm of the heavens and the deepest point of the subterranean realm of the underworld at opposite ends of the "world axis" (Rappenglück, 2014: 299-300). Reference to cardinal directions are also evident in some variations of the marine creature's form (Leeming, 2010: 18,324-325, 343). For instance, the dismembered body of Mesopotamian/Babylonian Tiamat, a water chimera with 'octopus-like' legs, was used to form the structure of the heavens, earth and "world axis", following its death at the hands of Marduk (at the time of the winter solstice). The Greek cave dwelling, nine-headed serpent-like Lernaean Hydra, which was similarly slain by Herakles/Hercules, is comparable, with eight heads being "mortal" and the ninth "immortal". This configuration of eight limbs (or heads) correspond to the eight cardinal directions extending from a central point (body and/or ninth head) representing the "world axis" or "celestial pole" (Witzel, 2008: 273-274; Rappenglück, 2014: 296-297). Similar configurations occur elsewhere, for instance, Iranian Aži Dahāka and Indian Viśvarūpa, slain by Thraētaona and Trita Āptya respectively, both have three heads and six eyes (Watkins, 1995: 464-465; Shaw, 2006: 153-160). Moreover, the 'multi-limbed' description of the aquatic creatures also resonates with the concept of the Milky Way being the celestial prototype, origin and counterpart of numerous rivers (Bertola, 2003: 96-102; Dy-Liacco, 2014: 158; Rappenglück, 2014: 298).

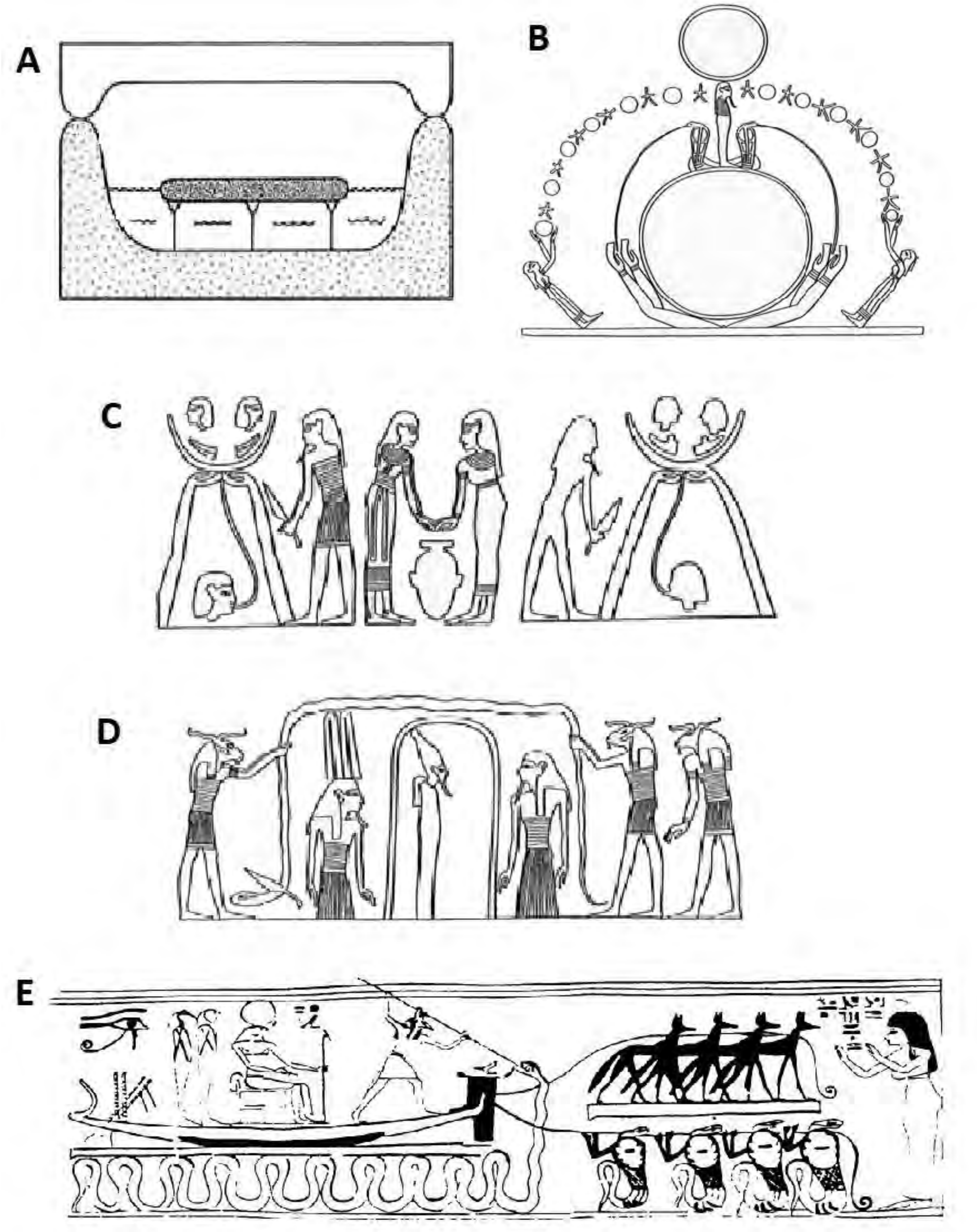


Figure 5.28: Aquatic serpents, the night-time journey of the sun, and the birth of the sun-god in iconographic representation of Egyptian mythology. (A) The world cave as a pregnant womb (Renggli, 2002: Fig. 2.); (B) The Fertilization of Nut/Isis. Note the serpents wrapping around the embrio (Renggli, 2002: Fig. 5.); (C) The birth of Ra/Horus. Note the serpents/umbilical cords about to be cut. (Renggli, 2002: Fig. 12.); (D) The Reincarnated Osiris. Note the killing of the serpent (Renggli, 2002: Fig. 14.); (E) Seth protecting Ra-Horus on his night-time journey and warding off the Apopis snake, as shown on a 21st Dynasty papyrus (Van Dijk, 1995: Fig. 3.)

The widespread ‘uroboros’ motif is considered to represent infinity and signify the boundaries and mixture of sky, water, and earth. It was described variously as a water creature shaped like a serpent, worm, or fish, which encircles the world and bites its own tail (Bächtold-Stäubli and Hoffmann-Krayer, 2006: 6352; Wessing 2006: 225; Leeming 2010: 100; Rappenglück, 2014: 298). Correlation between this concept with the Milky Way and rainbow, conceived as being located partially above and below the horizon is considered probable (Blust, 2000: 520, 532-533) and this may help to explain the wider connections between these phenomena and serpentiform imagery. In Germanic and Scandinavian tradition, Thórr catches the Miđgarđsormr (Jörmungandr) ‘worm’ using a fish hook with an ox skull as bait, which could refer to the Milky Way or rainbow being located on the horizon, as a symbol of the giant reptile or fish being pulled from the ocean depths (Olmsted, 1994: 83-84; Rappenglück, 2014: 298) .

The connection between aquatic serpents and the daily journey of the sun is elucidated by Egyptian mythology (Figure 5.28). At sunset Ra/Horus sank into the water, symbolically re-entering the amniotic fluid of his mother’s (Nut) womb. The ancient Egyptians believed that the womb ‘closed’ after conception. Thus, once Ra entered the water it was believed that in his foetal state he was ‘tied up’ by the Uraeus-snakes who defended against intruders during the course of the night. These serpents thus symbolize the umbilical cord which nurtures the child during pregnancy, but must be cut during birth. The baby has to ‘kill the cord’ as it breaks through the membrane of the amnion just as Ra fights and defeats the serpent Apophis in order to escape the water and be re-born blood-red on the horizon (Renggli, 2002: 2, 4-5, 9, 15; Witzel, 2008: 268). There are also ‘serpent’-related myths, some of which have been argued to reference the rainbow (Blust, 2000: 520, 529-530; Rappenglück, 2014: 298), which suggest connections with the water-cycle and/or the changing of the seasons. For instance, Estonian and Hungarian ‘rainbow serpents’ draw up water and sprinkle it back to earth and the Siberian Ostiaks call the rainbow the “thunderer [that] drinks water” (Lee and Fraser, 2001: 25, 29). In terms of the yearly solar journey both Marduk’s killing of Tiamat (Witzel, 2008: 28, 273-274; Rappenglück, 2014: 28, 296-297) and Ra’s slaying of Apophis (Renggli, 2002: 2, 4-5, 9, 15; Witzel, 2008: 268) occur at the winter solstice, while Vedic Índraḥ’s slaying of the giant water-serpent Vṛtráḥ, Dānaváḥ or three-headed Viśvarūpa to release torrents of water from the mountain suggests connections with the summer solstice, as do variants of the myth found in neighbouring regions (Olmsted, 1994: 66-67; Shaw, 2006: 153-160; Witzel, 2004, 2007, 2008: 269, 272, 277-278).

From an Irish perspective, a number of mythological references to aquatic serpent slaying occur. For example, a re-purposed version of the myth has been identified (Watkins, 1995: 441-447) in the ‘saga of Fergus mac Léti’ contained in a 16th century legal manuscript *Senchas Már*, in a treatise on distraint, *Cetharslicht Athgabála* (Binchy, 1952). Within this text Fergus defeats a marine serpent Muirdris under Loch Rudraige to re-establish order over chaos. Watkins (1995: 441-447) identified various comparisons between the themes and elements retained in the saga, and those of the Hittite slaying of the serpent Illuyankas. A second example is the slaying of Méiche 'au coeur triple' by Dian Cécht contained in the *Dindshenchus* (*Book of Leinster* 159 b 40; *Book of Ballymote* 358a, II 17b). Following victory over Méiche, son of the Morrígan (i.e. Danu, Ana, Dannan, Bóand) at Magh Méichi/Magh Fertaige to prevent the threat of 'cosmic devastation', Dian Cécht (Mac Cécht) cremated his three serpent-headed heart and threw the ashes into the River Barrow (Berba). Alternatively, Méiche was the serpent and large enough to attempt to consume his adversary and instead of having three heads, Méiche makes 'three turns' (possibly three coils of itself), maintaining its threefold aspect, before it is slain and its ashes cast into the river (Shaw, 2006: 161-165). Shaw (*ibid*.: 167-171, 176-177) has suggested a series parallels between Dian Cécht and various Indo-Iranian variants of the 'serpent slayer' and Greek Apóllōn the killer of the aquatic-serpent Pýthōn.

The third example is the slaying of the eel-like Mata in the Boyne Valley. Olmsted (1994: 201-206) has argued convincingly that the goddess Bóand was also known as Muiresc "Sea Fish", Mata "Eel", and Escung "Eel", as the Mórrígan transforms into an eel to battle Cú Chulainn in the *Táin* (*Yellow Book of Lecan*) and a Tadhg Dall O'Huiginn poem states that "Eithne and Bóand, two fins of gold from one tail". The slaying of Mata Murisc (Mátha) at Newgrange is described in a number of sources. Within the *Dindsinchas* (*Brug na Boinde II*, ll. 64, 71, 83-84) she is slain by the Ulstermen at Brug Maic ind Óg, her limbs broken on the "Lecc Bend" and Caisel n-Oengussa built over the bones. In the *Rennes Dindsenchas* of Ath Cliath Cualann (§28) the men of Erin slay the beast in Bruig Mac ind Óc before the Liacc Bend and discard her remains in the Boind (Boyne) and in the *Dindscenchas* (*Book of Leinster*, ll. 27-30) Mongan attacked her in the ford and slays the beast before Brug Meic ind Óc. Mata displays a number of features associated with cross-cultural representations of the aquatic-serpent, being described as a "seilc[h]i", i.e. having a 'shell' (sometimes translated as 'tortoise or snail') and as being 'multi-limbed', with "seven score [140] feet and seven heads" (Olmsted, 1994: 205). In addition, descriptions of Mata being killed and her bones being preserved at Carn Oengus resemble Greek Apóllōn's slaying of the "great she-dragon" or "she-serpent", known as Pýthōn in later accounts, at Delphi and the placing of her bones in a cauldron kept in the Pythiōn (Olmsted, 1994: 205, 253-254; Witzel, 2008: 273).

5.9.1 Marine Species

It appears that across Europe the most common marine species depicted consistently represent the largest species found locally. In the Northern Fennoscandian rock art tradition the most common marine species of represented differ between areas, with halibut in Alta (beginning c. 4200 BC) in Norway and salmon at Nämforsen (beginning c. 3000 BC) in Sweden. Beluga whales are most frequent at Zalavruga in the Vyg/White Sea area (beginning c. 2500/2200 BC) in Russia, and while various whale species occur in low numbers Alta (Helskog, 1985: 190; 2004: 285; Stoljar, 2001: 108, 118). The earliest phase of art at Alta (c. 4200-3600 BC) includes images of halibut fishing from boats (Figure 5.29), e.g. Bergbukten IV B, where a scene includes fishing from two elk-head protomed boats (Helskog, 1985: 190, 1987: Fig. 3.2, 2004: 276). In Western Russia notably detailed beluga whale hunting scenes (c. 2500/2200-1700/1500 BC) are depicted at New Zalavruga (Figure 5.29), including examples in group IV and group VIII and the Besovi Sledki panel (Stoljar, 2001: 119-120; Helskog, 2004: 279-280).

In Western European megalithic art depictions of sperm whales and a process of abstraction of their representation has been identified (Figure 5.29; Whittle, 2000; Cassen, 2005: 200, 202-203, 2007: 206, 2011: 19, 24-25, 2012a: 1343-1344). The most naturalistic depiction occurs on orthostat 1 (c4) at Mané Lud (Morbihan) (Cassen, 2007: 206, 2011: 19), while more abstracted variants have been identified in the so-called “axe-plough” motifs found elsewhere in southern Brittany at Mané Rutual (JS5, R1), Penhape (c1e), Kercado (capstone), Le Grand Menhir Brisé, Table des Marchands/Gavrinis and Dissignac (Shee Twohig, 1981: 58; Le Roux, 1992: 85-86; Whittle, 2000: 243-248; Cassen, 2005: 202-203, 2007: 206, 2011: 25, 2012a: 1343-1344). Cassen (2005: 200, 2007: 207, 2012a: 1343) has also argued that the Iberian motif dubbed “The Thing” (Shee Twohig, 1981: 29; Oliveira Jorge, 1998: 76; Bueno Ramírez and de Balbín Behrmann, 2003: 417; Bueno Ramírez, et al., 2005: 580-584, 2008: 56), which have been described as representations of axes (Bueno Ramírez and de Balbín Behrmann, 2002: 627, 2003: 417; Bueno Ramírez, et al., 2005: 580-584, 602, 2007: 60-604, 2008: 56) are reminiscent of the Breton “axe-plough” motif and may be represent similarly abstracted depictions of whales.

Hensey (2010: 244-247) has argued that within the megalithic art tradition in Ireland, the ‘cross-hatching’ design on K1 and K52 at Newgrange 1 may reference the patterning of the scales of the Atlantic salmon, which visit the Boyne seasonally, and the ‘herringbone’ design on L19, K93, C2 and C14 salmon flesh. Although these interpretations are possible, the current author considers their viability to be questionable. It could be suggested that if the ‘cross-hatching’ were to allude to the scales of a marine creature seasonally associated with the Boyne, then references to eel skin are just as plausible as that of salmon. But advancing any such connections would appear highly subjective and ultimately ambiguous. Although representation of salmon flesh cannot be entirely dismissed, as discussed above (5.5.1.4) various parallel chevron or ‘herringbone’ motifs may have been more commonly associated with vegetal symbolism, so aquatic connotations may

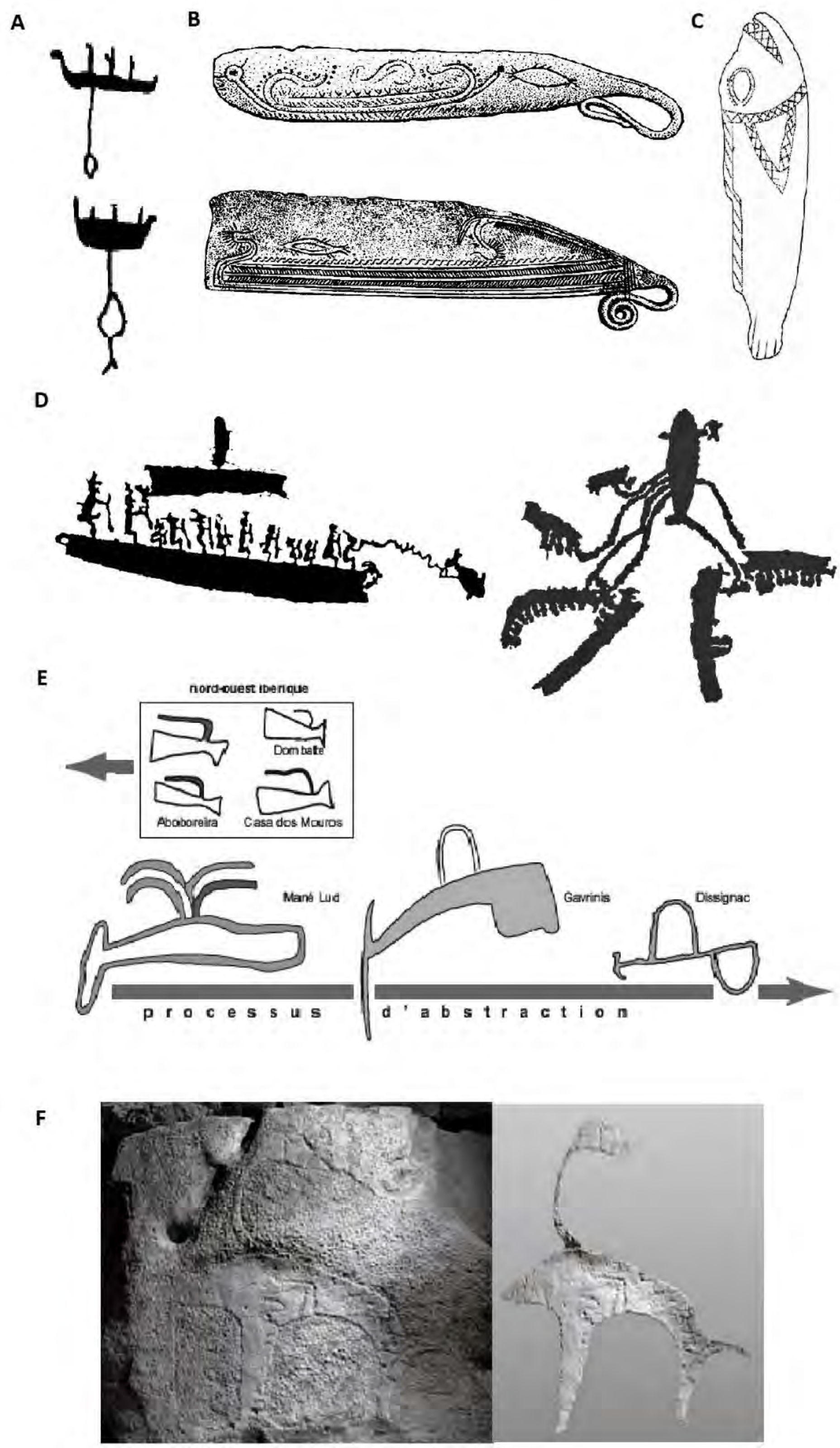


Figure 5.29: Depictions of large marine species. (A) Examples of fishing from the Bergbukten IV B rock art panel () (adapted from Helskog, 1985: Fig. 9); (B) Fish associated with ship-representations on bronze razors from Denmark. Top: Skjellerup (Jylland) (Kaul, 1998: Fig. 140.); Bottom: Karup Mark (Jylland) (adapted from Kaul, 1998: Fig. 142.); (C) Fish-shaped razor from Ireland (adapted from Kavanagh, 1977: Fig. 32.); (D) Examples of depiction of whale harpooning on rock art panels at New Zalavruga (Russia) (adapted from Stoljar, 2001: Fig. 23.; Heklsog, 2004: Fig. 23.); (E) Graphic depiction of the process of abstraction in whale representation in Brittany and Iberia (adapted from Cassen, 2007: Fig. 2.); (F) Whale depiction in Knowth passage tomb (Ireland) (Hensey, 2015: Fig. 5.3)

be unlikely. However, marine symbolism does appear to occur within the Irish artistic repertoire, as more recently Hensey (2015: 88-94) has built a strong argument for the interpretation of a motif in the chamber of the western tomb at Knowth 1 (orthostat 41) as a depiction of a humpback whale (Figure 5.29).

Fish-images occur alongside ship-representations (as well as solar-symbols, horses and birds) on a number of south Scandinavian and north German bronze razors (Figure 5.29; Kaul, 1998: 216-221, 2014), which date to the second half of the 2nd millennium BC. Specific species are generally not identifiable, but the fish on one razor (*ibid*.: cat. no. 378), has been tentatively described as "flounder-like" (*ibid*.: 219), so identification as halibut would seem plausible in this instance (if not elsewhere). Fish of similar appearance also occur on Danish and Swedish spearheads (c. 1700-1300 BC) from Valsomagle (Sjydland) and Haga (Gotland) (c. 1700-1300 BC) and rock art depictions at Vadgård (Jylland) (c. 1500-1300 BC) and Kivik (Skåne) (c. 1400/1100-900 BC) (Kaul, 1998: 221). A razor from Torupgårds Mark (Nordjylland) Denmark features a bird appearing to grasp the head of a fish in its beak. A possible bird of prey is depicted beside a vertically orientated fish on a specimen from Folkestad (Bohuslän) in Sweden, and a similar association occurs on another Swedish razor from Svarta Fisklåge (Skåne) (*ibid*.: 217-220). It may also be notable that there is an uncontexted Irish decorated 'fish-shaped' EBA bronze razor (Figure 5.29). It was suggested that it depicts a member of the 'carp' family (Kavanagh, 1991: 102), but the current author suggests its morphological features appear to indicate most closely resembles an adult pike.

5.9.2 Serpentiforms

In western Russia occasional serpentiform representations occur in the Lake Onega region (Karelia), sculptures having been recovered from two graves in the 6th millennium BC Yuzhniy Oleniy Ostrov Island cemetery (Popova, 2001: 127-133) and depictions also represent a minor component of the later rock art tradition (believed to probably begin in the mid- or late-4th millennium BC) found in the area (Poikalainen, 1999). Figurines of marble and clay representing anthropomorphic/ophidian females with serpentiform limbs first emerged on Crete and other Aegean islands during the first half of the 6th millennium BC and during the mid-5th millennium BC opposed serpent-heads and double pairs of serpentiforms (on occasion associated with other motifs including possible solar-symbols) were frequent decorative motifs on ceramics in parts of Romania (Gimbutas, 1989: 126).

Unambiguous serpentiforms occur within the repertoire of megalithic art in France, but it is unclear if the zig-zag and curvilinear motifs on orthostat 21 re-used in the kerb of the Tossen-

Keler cairn (Le Quellec, 2006: 695) should be included in this category. However, serpentiform depictions with well-defined heads have been recorded on menhir 2 of St-Clément-sur-Guye (alignment) (Burgundy) (*ibid*.), the Grande Pierre Levée menhir of La Bretellière (St-Macaire-en-Mauges, Maine-et-Loire) (Scarre and Raux, 2000; Le Quellec, 2006: 692, 695; Cassen, 2012a: 1329), the Le Manio Menhir in Carnac (Morbihan) (Cassen, 2000a: 718; Le Quellec, 2006: 695), orthostats 4, 6 and 8 at Gavrinis (Larmor Baden, Morbihan) (Le Roux, 1992; Cassen, 2000a: 721, 2012a: 1320; Le Quellec, 2006: 695). Groups of horizontal serpentiforms are found among the symbolic repertoire of Breton Castellic pottery, most notably on the vessels discovered in tombs at Lannec er Gadouer and Saint-Germain in Erdeven (Cassen, 2000a: 718, 721). In the case of the former the serpentiforms are depicted on distinct 'lower planes' above which naturalistic 'arboriform' motifs occur and a similar composition featuring a single serpentiform or meandering line on the 'lower plane' occurs on orthostat 3 in the Table des Marchands (Figure 5.20; Cassen, 2000a: 718, 721; Robin and Cassen, 2009: 854-855; Robin, 2012: 144-145).

Another notable feature of the French serpentiforms is their juxtaposition with axe-symbolism at a number of the sites. For instance, a jadeitite axe was discovered at the foot of the menhir at La Bretellière and several pairs of jadeitite axes were found in the surrounding area (Cassen, et al., 2010; Cassen, 2012a: 1329) and five axes deposited cutting edge upwards against the base of the Manio menhir, which features five vertical serpentiforms, four with a well-defined heads, at the base of the Le Manio Menhir in Carnac (Morbihan) (Cassen, 2000: 718, 721; Le Quellec, 2006: 695, 710). This association has also been documented at Gavrinis (ortostat R8) where a pair of axes are depicted to the left of three vertical serpentiorms and a third axe occurs to their right (Le Roux, 1992: 88; Cassen, 2000a: 721, 2012a: 1320; Le Quellec, 2006: 695, 710). In this context it may also be notable that three fibrolite axes were deposited vertically in a pit within the Lannec er Gadouer tomb (Cassen, 2000a: 718).

Numerous carved and painted serpentiforms are present in Iberia between the 6th and 3rd millennia BC, but it is not possible to consider all of these in detail, particularly as not all are unambiguously figurative. Iberian depictions include vertically orientated specimens (e.g. menhirs at Gargantáns, Galacia and Monte da Ribeira, Évora and megalith at Navalcán, Toledo and Guadalperal, Caceres) (Bueno Ramírez and de Balbín Behrmann, 1995, 2006a: 94, 97), which Le Quellec (2006: 695) compared to similar representations in France. Many of the serpentiforms have well-defined heads represented by a circle, v-shape, lozenge, a rectilinear angle or cupmark (e.g. Magacela, Badajoz and Maimon 2, Caceres) and examples associated with solar-symbols (e.g. Carapito 1, Aguiar da Beira and Granja Toniñuelo (orthostat C6), Badajoz) (Bueno Ramírez and de

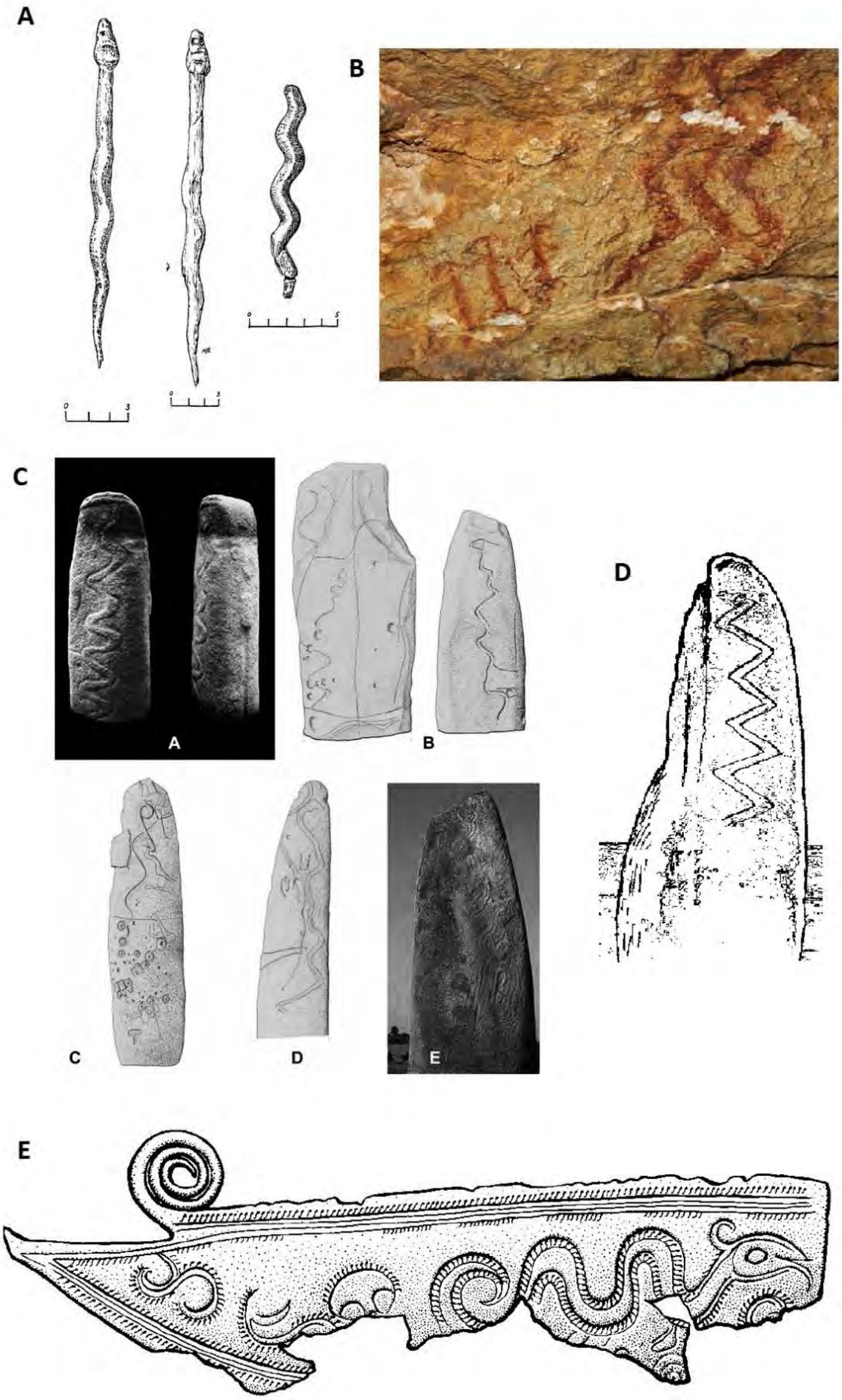


Figure 5.30: Selection of serpentiform representations. (A) Serpetiform figures from Yuzhniy Oleniy Ostrov Island (Russia) (Popova, 2001: Figs. 1-2, 4); (B) Vertical zig-zag serpentiforms from Balsa de Calicanto, Valencia (Spain) (Hernández Pérez, 2014: Fig. 7.); (C) Serpentiforms in Iberian megalithic art. (a): Dolmen de Navalcán, Toledo (Spain); (b): Dolmen de Guadalperal, Caceres (Spain); (c): Monte da Ribeira, Évora (Portugal) ;(d): Gargantans, Pontevedra, Galicie, (Spain); (e): Bulhoâ, Évora (Portugal) (Bueno Ramírez and Balbín Behrmann, 2006a: Fig. 4.); (D) La Bretellière menhir, Maine-et-Loire (France) (Scarre and Raux, 2000: Fig. 3.); (E) Danish Razor (probably from Lolland) featuring a serpentiform (Kaul, 1998: Fig. 150)

Balbín Behrmann, 1995, 2006a: 94, 97). In addition, serpentiforms (both singular and multiple), in both vertical and horizontal orientations are also a feature of the repertoires of Cardial and epi-Cardial ceramic decoration and the 'macro-schematic' and possibly the later 'schematic' rock art traditions (Gómez-Barrera, 2005: 32-34; Mateo Saura, 2005: 143, 2008: 12, 15-16; Collado Giraldo and García Arranz, 2013: 295; Hernández and Hernández, 2013: 17-20; Hernández Pérez, 2014: 145, 147). Within the 'macro-schematic' tradition (c. 5600/5500-4500/4300 BC) they are on occasion associated with or integrated into anthropomorphic figures, particularly in the form of stylized arms (Mateo Saura, 2005: 143, 2008: 12, 15-16; Hernández and Hernández, 2013: 17-20).

Serpentiform: circular 'head' design	
Dot	Knowth 17 (orthostat 7); Newgrange 1 (k18b, K89; 2 figures); Newgrange site L (orthostat A); Dowth North (c19); Dowth South (R1); Loughcrew Cairn T (c3); Loughcrew Cairn U (c11); Loughcrew Cairn X1; Tara (c2); Knockmanny (c11)
Circle	Knowth 14 (orthostat 8); Loughcrew Cairn F (L3); Knockroe (k31); Dún Loaghaire (2); Bryn Celli Ddu
8-shaped	Newgrange 1 (orthostat c3); Loughcrew Cairn H (orthostat c14)
Serpentiform: angular 'head' design	
Angle	Knowth 1 (k31, k32, k64, k81, k113); Newgrange 1 (k50); Loughcrew Cairn L (c5)
Triangle/Square	Knowth 4 (orthostat A); Knowth 14 (orthostat 8; 3 figures)
v-shaped	Knowth 1 (k94); Newgrange 1 (orthostat c3)

Table 5.5: Serpentiform variants with 'heads' in Irish megalithic art (adapted from Robin, 2009: 77-85, 2012: 145-147)

Serpentiform Variants	
cup(s) inside the curves of serpentiforms	Knowth 1 K83; Knowth East, cell N; Newgrange site K, orthostat 5; Loughcrew Cairn F R2; Loughcrew Cairn T c1/c2 ; Loughcrew Cairn U C9; Millin Bay, M22; Bryn Celli Ddu
serpentiforms connected to a circular symbol	Loughcrew Cairn T, Roof stone cell E; Tara, c2
spirals that transition into serpentiforms	Knowth 1 k13, k17, k41, k52; Knowth 14 (orthostat 8); Dowth South R1; Knockroe k31; Bryn Celli Ddu
Vertical parallel serpentiforms	Newgrange 1 K12 ; Newgrange site L orthostat A; Dowth South C6, C7; Loughcrew Cairn H K8 ; Kiltierney, East; Barclodiad y Gawres C16 ; Bryn Celli Ddu

Table 5.6: Serpentiform variants in Irish megalithic art (adapted from Robin 2009: 79, 133)

Within the repertoire of Irish megalithic art Robin (2009: 77-85, 2012: 145-147) has identified a series of serpentiform motifs with distinct 'heads' defined by a cup, a circle, a V, a lozenge or a rectilinear angle (Table 5.5, Figure 5.31). He has noted that these are reminiscent of those found in France and Iberia and that in both Ireland and Brittany these motifs are situated variously close to the ground level, on the less visible areas of stones, and in 'hidden' locations (Robin, 2009: 77-85, 265-267; 2012: 145-147). Parallels may also be drawn between the association of Iberian sepentiorms with solar-symbols and the occurrence of (a) cup(s) inside the curves of serpentiforms, (b) serpentiforms connected to a circular symbol composed of a circle with central

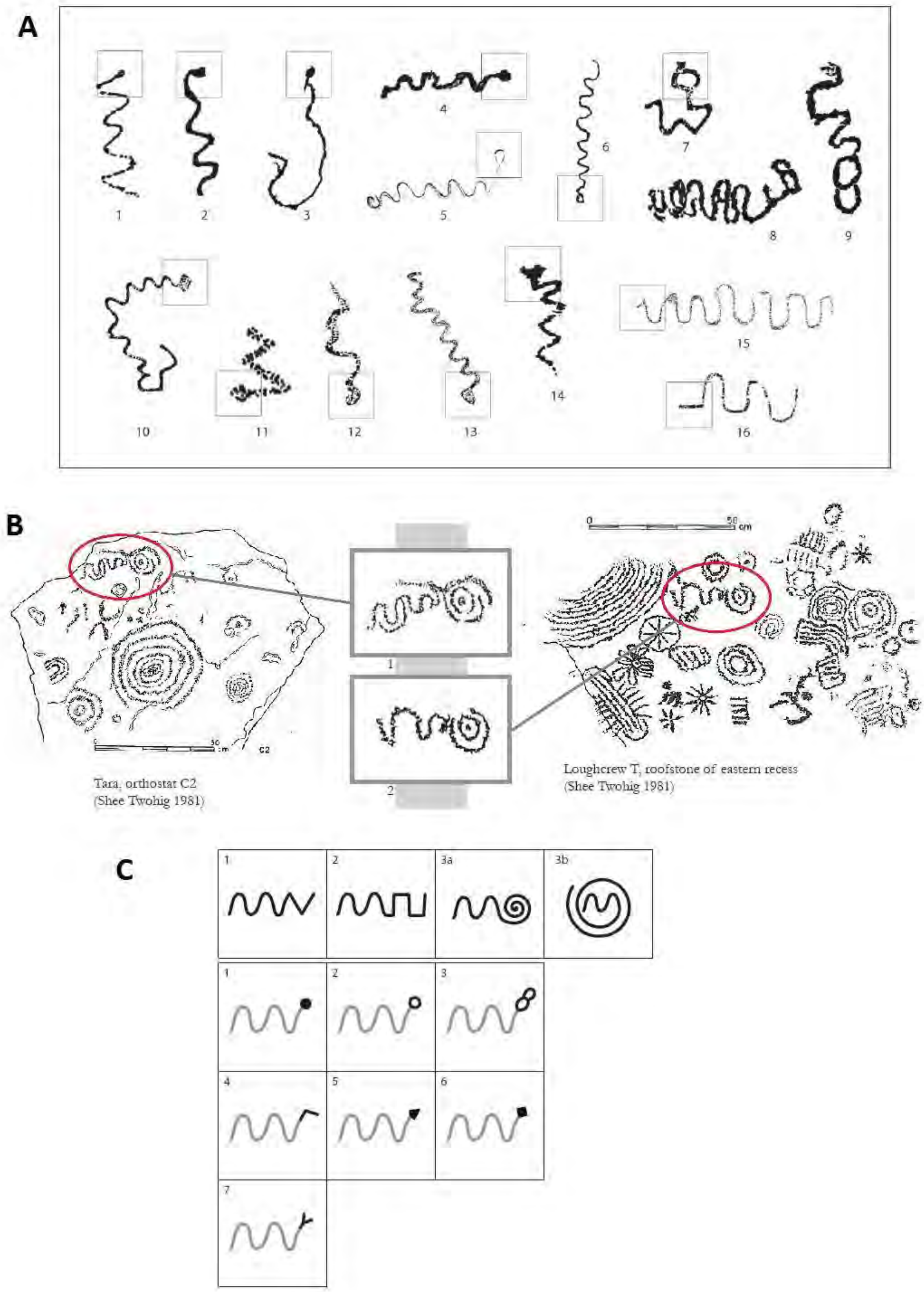


Figure 5.31: Meandering lines/serpentiform motifs in Irish megalithic art. (A) Examples of serpentiform motifs with identifiable heads. 1: Newgrange L, Stone A; 2: Dowth South, orthostat R1; 3: Loughcrew T, orthostat C3; 4: Newgrange, kerbstone 18; 5: Knockroe, kerbstone 31; 6: Barclodiad y Gawres; 7, 10, 12, 13: Knowth 14, orthostat 8; 8: Newgrange, orthostat C3; 9: Loughcrew H, orthostat C14; 11: Knowth 4, stone A; 14: Knowth, kerbstone 94; 15: Knowth 1, kerbstone 64; 16: Knowth 1, kerbstone 113 (Robin, 2012: Fig. 10.3.); (B) The hybrid 'meandering line/serpentiform and circular symbols (Robin, 2009: Fig. 92.); Typological table of the meandering line/serpentiform symbols (Robin, 2009: Fig. 46.)

cup inserted in a nearly closed arc, and (c) spirals whose outer ends transition into serpentiforms/meandering lines in Ireland (Robin 2009: 79, 133; see Table 5.6). The Irish vertical parallel serpentiforms/meandering lines (Robin 2009: 113; see Table 5.6) also suggest affiliations with French and Iberian motifs. In addition, as outlined above Breton equivalents are also evident in the serpentiforms depicted below 'ramiform/arboriform' motifs (interpreted as schematic representations of trees), on orthostat c3, k51 and rs3 in Newgrange 1 (Figure 5.20; Robin, 2009: 149, 2012: 144-145; Robin and Cassen, 2009: 854-855).

Unambiguous zoomorphic serpentiform imagery appears rare (if not largely absent) in the Beaker artistic repertoire and the serpentiform boars tusk pendant from one of the Ifri n'Ammar (Khemisset) in Morocco (Bokbot and Ben-Nçer, 2006: 329, Fig. 4; Růžičková, 2009: 46) is currently unique. During the second half of the 2nd millennium BC serpentiform representations are found in southern Scandinavia and northern Germany. These include depictions associated with ship-symbols on bronze razors and rock art panels, occasional representations on pottery vessels and a cast bronze figurine from the Fårdal hoard (Viborg) Denmark (Kaul, 1998: 221-241). It may also be notable that a number of the Scandinavian rock art serpentiforms have v-shaped heads and one of the examples in Slänge (Tanum) Norway, occurs in front of a ship carrying several human-figures including a lur-blower and an individual holding an axe (*ibid*.: 231). Serpentiform-limbed female figurines, the most famous being faience statuettes from Knossos (c. 1600-1500 BC) and ivory seals featuring double serpentiform motifs were common on Crete throughout the 2nd millennium BC (Gimbutas, 1989: 126, 293).

5.10 Symbolism and Weapons

As highlighted above the juxtaposition of serpentiform and axe imagery is conspicuous within Breton megalithic art. If this association is indicative of both 'serpent slaying' and the cutting of the umbilical cord in the context of the 'solar journey', they may also have carried male (axe) and female (serpent) connotations. It may also be advanced that this nuanced message involving 'serpent slaying' could have been inherently conveyed by the axe as symbol in and of itself.

Axe symbols, in a variety of forms, are relatively widespread within French megalithic art (Figure 5.32), the greatest concentration occurs in Brittany (Shee Twohig, 1981: 58-60, 64, 74-75, 80, 84-86, 88; Le Roux, 1992: 87; Le Quellec, 2006: 710; Cassen, 2007: 207-208, 2011: 17; 2012a). In addition to representations in France, an axe depiction has also been recorded in a megalithic tomb (c. 3360-3100 cal. BC) at Göhlitzsch (Saxony-Anhalt), central Germany (Müller, 1997; Cassen, 2012a: 1343) and it occurs throughout the Valcamonica region (c. 5500/5000-3500/3200 BC) of northern Italy (Anati, 2008: 17-21). As noted above, Cassen (2005: 200, 2007: 207, 2012: 1343) has cast doubt on the identification of axes in Iberian megalithic art, although other researchers disagree (e.g. Bueno Ramírez, et al., 2005: 580-584, 589, 600-602, 607-609), but either way, axe imagery was certainly present in the region. For example, it has been noted that the majority of slate and schist plaques are reminiscent of stone axes in form (Lillios and Thomas, 2009: 142-143; Thomas, 2009: 74; Thomas, et al., 2009: 55). Furthermore, Gonçalves (2006: 502, 505, 508-509) has noted that during the later 4th millennium BC these objects appear to in fact replace polished stone axes in burial contexts in central and southern Portugal, which it could be argued indicates that they carried similar symbolic connotations.

The crozier/crook/lacrosse symbol found in France, Iberia and Central Europe (Shee Twohig, 1981: 29, 36, 58, 69-70, 88, 90-91; Le Roux, 1992; Calado, 1997; Gonçalves, et al., 1997; Cassen, 2000c, 2005: 200-201, 2007, 223-224; 2011: 16-17, 2012a: 1344, 2012b; Bueno Ramírez and de Balbín Behrmann, 2003: 423; Constantin, 2003; Bueno Ramírez, et al., 2005: 583, 601-602, 618-619) may have an affinity with that of the axe. In addition to representations in megalithic art and on ceramics the Iberian schist 'baculos' objects may represent these same items (Shee Twohig, 1981: 36, 124-125; Hurtado, 2008: 2-3; Lillios, 2010: 65-66). The traditional interpretation of this symbol, as favoured in Iberia (e.g. Calado, 1997; Gonçalves, et al., 1997; Bueno Ramírez and de Balbín Behrmann, 2003: 423; Bueno Ramírez, et al., 2005: 583, 601-602, 618-619), is that they depict crooks associated with animal husbandry, but Cassen (2000c, 2005: 200-201, 2007, 223-224; 2011: 16-17, 2012a: 1344; 2012b) argues that these represent 'throwing-stick' type weapons.

In the later 4th or 3rd millennia BC axe depictions occur in gallery graves (Shee Twohig, 1981: 73-74), on a small number of anthropomorphic statue-menhirs in the south of France (Cassen, 2012a: 1312) and possibly at Sion (Valais) Switzerland (Harrison and Heyd, 2007: 159-161) and the rock art region of Valcamonica is somewhat atypical with axe symbolism continuing throughout the majority of the 3rd and 2nd millennia BC (Frachetti and Chippindale, 2002: 122, 125, 129-130, 132-133; de Saulieu, 2004, 2007; Fossati, 2007: 143-145; Anati, 2008: 22, 29-33 2009: 939, 943-944, 955-956). In more general terms, the widespread and pervasive nature and importance of axe symbolism throughout Neolithic Europe is demonstrated by the distribution and deposition of the polished stone artefacts themselves (e.g. Turek, 2001; Pétrequin, et al., 2002, 2008, 2012a, 2012b, 2015a, 2015b; Larsson, 2004; Wentink, 2006; Davis and Edmonds, 2011; Pétrequin, 2012). During the 3rd and 2nd millennia BC period representations of axes are relatively rare in Western Europe, with these being limited to a few possible depictions in north-western Iberia (Bradley, et al., 1995; Bradley: 1998; Bradley and Fábregas Valcarce, 1998; Van Hoek, 2001: 213-215) and representations in Britain at Stonehenge (Wiltshire) in southern England (Bradley, 1998: 140; Van

Hoek, 2001: 212-213; Abbott and Anderson-Whymark, 2012; Darvill, et al., 2012: 1037) and a small number in Scotland (Van Hoek, 2001: 213).

The importance of axe symbolism was certainly widespread however, and continued into the 2nd millennium BC as evidenced by the 'votive' deposition of bronze axes (e.g. see Bradley, 1990, 2000: 47-63; Fontijn, 2002; Cooney, 2004; Becker, 2013). Axe symbolism also occurs on occasion within the rock-art repertoire of southern Sweden (c. 1700-1500 BC) and it may be notable that these representations are contemporary with those at Stonehenge (Darvill, et al., 2012: 1037). Swedish examples include a depiction of twin axe bearers, and a ship associated with a pair of axes at Simris in Scania (Kristiansen and Larsson, 2005: 202, 275). The pairing of axeheads is a recurrent theme throughout the European Neolithic and Bronze Age. For instance, at Gavrinis in Brittany, where axe representations are particularly prominent, twelve obvious couples have been recorded (Cassen, 2012a: 1320-1321) and pairs of polished stone axeheads have been recovered at a number of sites in France (e.g. Cassen, 2012a: 1341). Another notable example is the Nebra 'sky-disc' (c. 1600 BC) discovered near Halle, eastern Germany which was accompanied by twin swords and axes (Maraszek, et al., 2009). In an Irish context, although axe depictions are absent from the Neolithic-Bronze Age artistic repertoires, paired axes appear to be a consistent feature of 'votive deposition'. Over 35% (26 pairs) of the Irish Neolithic hoards containing stone axeheads are pairs (Cooney, 2004: 39) and the pairing of axeheads continued during the course of the Bronze Age, most notably during the EBA (Harbison, 1969b; Eogan, 1983, 2000; O'Flaherty, 1995; Cooney, 2004: 39; Becker, 2006) suggesting continuity between the 4th and mid-2nd millennium BC and even stretching to the earlier 1st millennium BC.

In France during the later 4th and earlier 3rd millennia BC dagger symbols occur in a number of gallery graves (Shee Twohig, 1981: 73, 80), and on the statue-menhirs in France (Peeters, 2005: 290), as well as those at Sion (Valais) Switzerland (Figure 5.32; Harrison and Heyd, 2007: 159-161). As discussed later daggers appear to have held symbolic importance throughout the 3rd millennium BC (8.7.2). This significance continued into the first half of the 2nd millennium BC as evidenced for example in the EBA dagger burials of the British Isles (Baker, et al., 2003: 109-112; Wilkin, 2011; Curtis and Wilkin, 2012: 246-247; Jones and Quinnell, 2013; Mount, 2013: 189, Table 2). Returning to artistic representations, daggers and halberds are a feature of Iberian megalithic art in western/central and northern areas (Bueno Ramírez, et al., 2005) and include specimens associated with the 'idol-like' anthropomorphic representations (Bueno Ramírez, et al., 2005: 586-593, 597-610, 2007: 609; Prieto Martínez, 2013: 226-227) and examples on statue-menhirs (Bueno Ramírez, et al., 2005: 603-604, 2009: 904-905). They also feature prominently in the rock art repertoires of north-western Iberia (Bradley, et al., 1995; Bradley: 1998; Bradley and

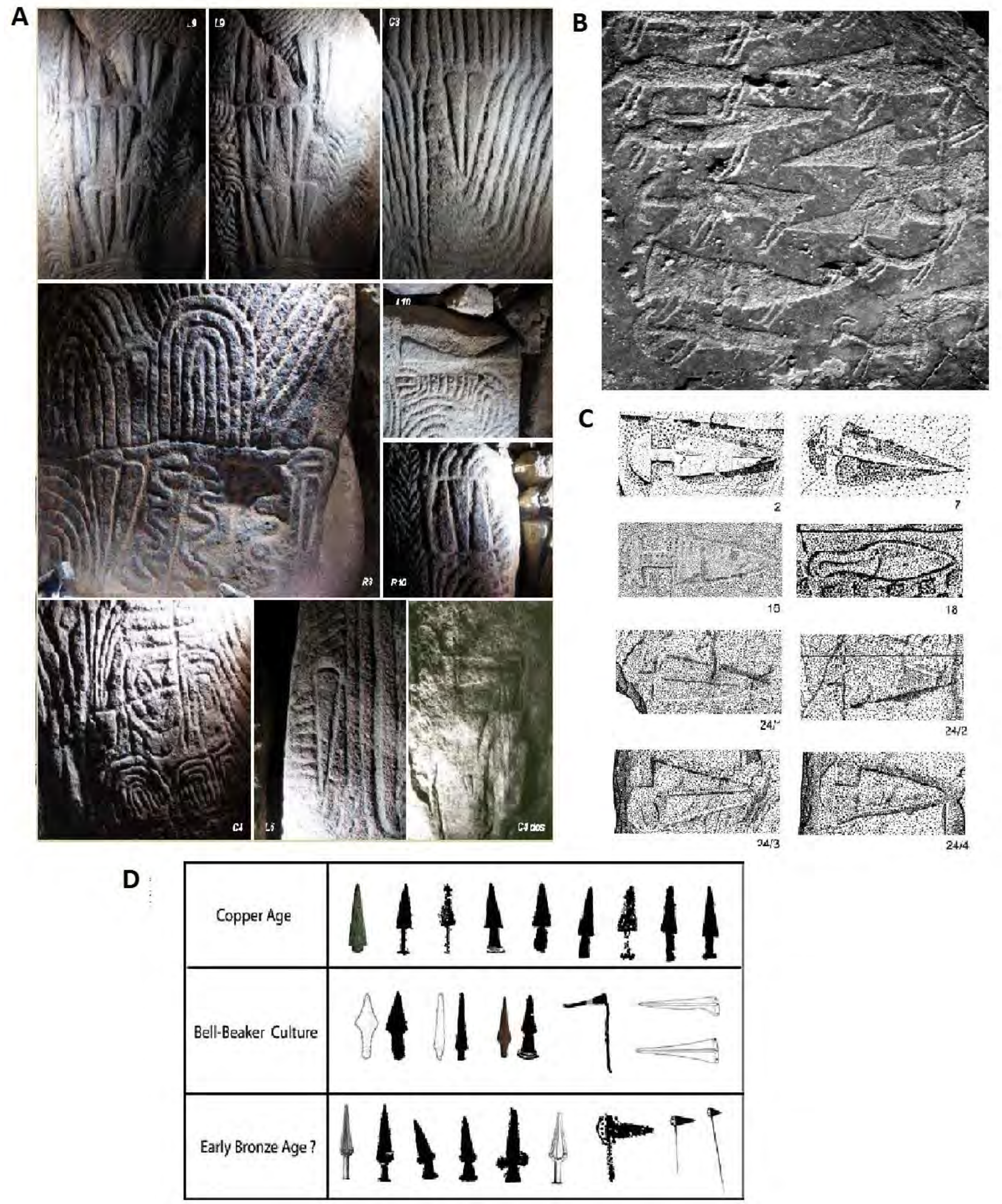


Figure 5.32: Iconographic representations of axes, daggers and halberds. (A) Axe representations within the Gavrinis passage tomb in Morbihan (France) (Cassen, 2012a: Fig. 5.); (B) Example of daggers depicted at Valcamonica (Italy) (Anati, 2009: Fig. 18.); (C) Drawings of daggers on stelae at Sion (Switzerland) (Harrison and Heyd, 2007: Fig. 24.); (D) Comparisons between carved daggers and halberds at Mont Bego (France) and prehistoric artefacts (adapted from Bianchi, 2010: Fig. 10)

Fábregas Valcarce, 1998; Van Hoek, 2001: 212-217; Fábregas Valcarce, 2009), the Maghreb area of North Africa (Papa, 2008/2009: 59-61) and such alpine sites as Mont Bego (Figure 5.26, Figure 5.32, Figure 5.40; Barfield and Chippindale, 1997; de Saulieu, 2004, 2007; Iglesias, 2008: 126; de Lumley, et al., 2009; Bianchi, 2010; Horn, 2013) and Valcamonica (Figure 5.32, Figure 5.37;

Frachetti and Chippindale, 2002: 129-133; Fossati, 2007: 143-145; Anati, 2008: 22, 27-33, 2009: 939, 943-944, 955-956). Copper and bronze halberds had a wide distribution (O'Flaherty, 1998; Schuhmacher, 2002) and were deposited in both graves and 'votive' contexts (Harbison, 1969a; O'Flaherty, 1995, 1998, 2002, 2003; Lull, 2000; Schuhmacher, 2002; Becker, 2006, 2013; Horn, 2011). It has been argued that based on use-wear analysis halberds were used in a form of stylised or 'fencing-like' combat (Brandherm, 2004, 2011; O'Flaherty, 2007a, 2007b; O'Flaherty, et al., 2008, 2011; Dolfini, 2011; Gilchrist and O'Flaherty, 2011; Horn, 2014), but their employment in ceremonial contexts as 'performative paraphernalia' and/or in animal sacrifice cannot be excluded, particularly if examples were attached to oversized hafts as depicted at Mont Bego. It is also notable that it has been advanced that both daggers and halberd representations at Mont Bego, may have been connected with fertility symbolism (de Lumley, et al., 2009: 986-987, 991; Horn, 2013).

Human figures carrying bows and arrows, sometimes as groups engaged in hunting, fighting or "executions" are a notable feature of the 'Levantine style' of rock art in Iberia, beginning c. 5600/5500 BC and certainly continuing into the 4th and possibly 3rd millennium BC based upon the arrow forms depicted (Gómez-Barrera, 2005: 38-50; Guilaine and Zammit, 2005: 102-121; Mateo Saura, 2005: 135-138, 2008; Villaverde Bonilla, et al., 2006; Hernández Pérez, et al., 2007: 41, 49-50, 53-55; Wintcher, 2011: 4, 22, 27, 39, 60, 70, 135, 140-145, 157-158, 165-167; Hernández and Hernández, 2013: 20-21). Depictions of archery are rare in Iberian megalithic art but 'hunting scenes' have been recorded within monuments at Lubagueira and Arquinha da Moura in the Viseu region of central Portugal (Shee Twohig, 1981: 36, 90; da Cunha, 1995; Bueno Ramírez, et al., 2005: 581). In France depictions of archery equipment are relatively rare in megalithic art, but bows (and arrows) do occur at Île Longue (RS6), Gavrinis (L6), Runesto (C5) and Barnenez (HJ1) in Brittany, Le Berceau (orthostat) at St-Piat (Eure-et-Loire) and Le Déhus (central capstone) (Vale) on Guernsey (Shee Twohig, 1981: 63; Le Roux, 1992: 87; Le Quellec, 2006: 697-698, 715; Cassen, 2012a: 1318, 1327; Cassen, et al., 2015), as well as Göhlitzsch (Saxony-Anhalt), central Germany (Shee Twohig, 1981: 90; Müller, 1997). It may also be notable that these are closely associated with axe representations at Gavrinis (paired), Barnenez (paired) and Göhlitzch, a crozier/crook/lacrosse at Le Déhus, and directly connected with representations of arrows at Gavrinis, St. Piat and Göhlitzch. In addition to daggers and occasional axes, the combination of simple longbows and at least one arrow occur on four statue-menhirs (three arrows on stela 1) at Sion (Valais) in Switzerland (Harrison and Heyd, 2007: 160) and bows also occur on statue-menhirs in Southern France (Peeters, 2005: 290).

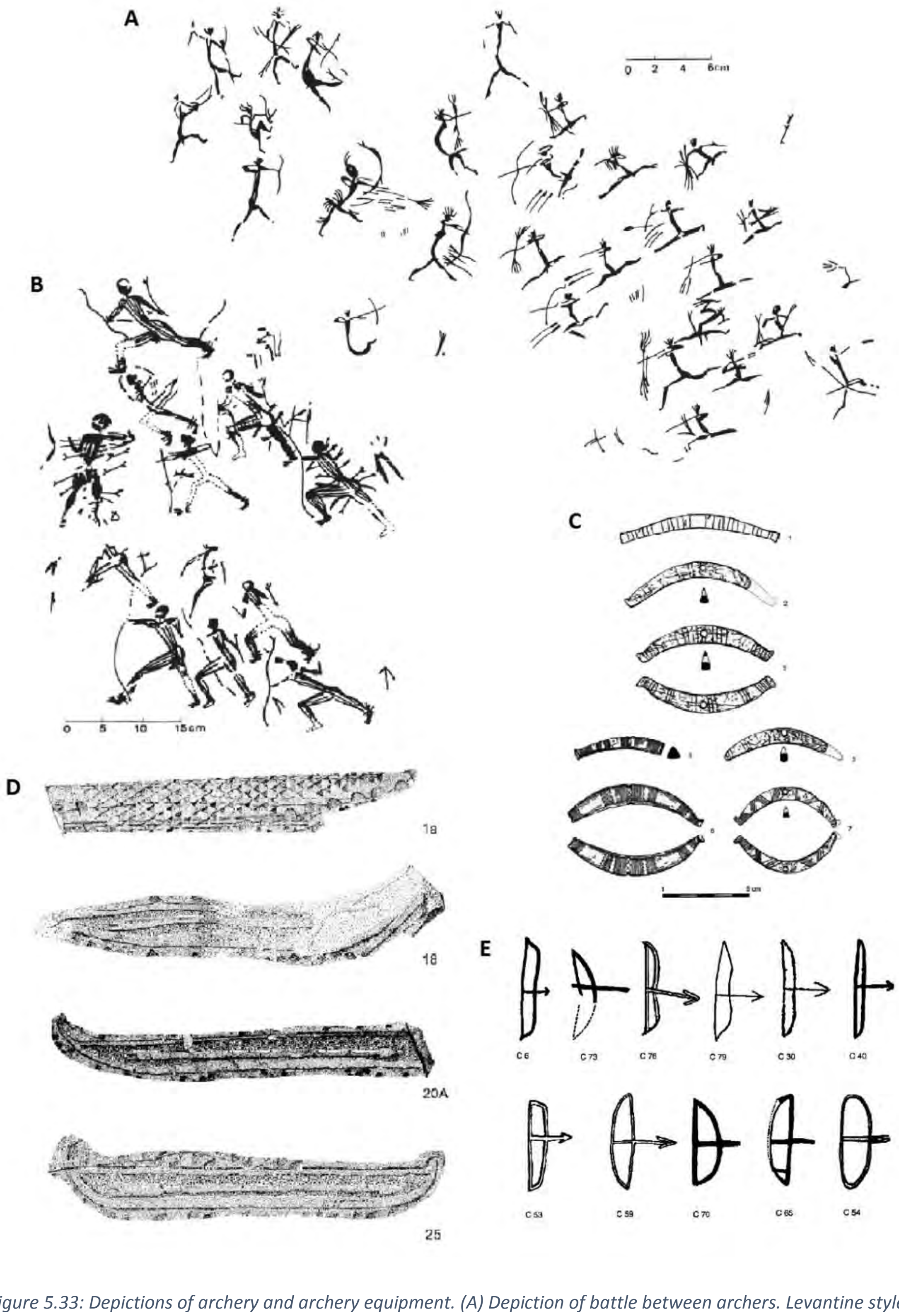


Figure 5.33: Depictions of archery and archery equipment. (A) Depiction of battle between archers. Levantine style art depiction from Los Dogues rock shelter, Ares del Maestre (Spain) (Guilaine and Zammit, 2005: Fig. 26); (B) Archers attack an enemy, whose body is riddled with arrows. Levantine style art depiction from Minateda rock shelter, Albacete (Spain) (Guilaine and Zammit, 2005: Fig. 28.); (C) Selection of Beaker bow-shaped pendants. 1, 6: Želešice (Czech Rep.); 2-3, 5, 7: Šlapanice (Czech Rep.); 4: Rousínov (Czech Rep.) (Růžičková, 2009: Fig. 20.); (D) Drawings of the bow and arrow on stelae at Sion (Switzerland) (Harrison and Heyd, 2007: Fig. 23.); (E) Depictions of the bow and arrow on Iberian 'warrior stelae' (adapted from Harrison, 2004: Fig. 7.15.)

As outlined later (8.7) archery symbolism was particularly prominent across Europe during the Beaker associated Chalcolithic of the later stages of the 3rd millennium BC with the deposition of 'archery equipment' in funerary contexts. Aside from 'archery equipment' itself among the items associated with Beaker burials the 'bow-shaped' pendants, may be explicitly connected with the symbolic importance of archery. These items which were made of boars tusk or less commonly bone or amber, occur most commonly in eastern areas of the Beaker distribution (Bohemia, Moravia, Bavaria, Hungary and Poland), but also in Central Europe (Germany, Austria, Switzerland, and Italy) (Piggott, 1971; Makarowicz, 2003a: 145, 2003b: 142; Heyd, 2007a: 341; Fokkens, et al., 2008: 213; Růžičková, 2009: 43, 46, 61; Budziszewski and Włodarczak, 2010: 62-63, 150; Fitzpatrick and Barclay, 2011: 59-61), and specimens are also found in more western regions, including Britain, the Netherlands and eastern parts of France (Fokkens, et al., 2008: 213; Růžičková, 2009: 43; Fitzpatrick and Barclay, 2011: 59-61; Lemercier, 2012b: 137; Vergnaud, 2013: 56). Piggott (1971) interpreted these items as miniature, stylised representations of the type of bow in use and this explanation is widely accepted, but recently Budziszewski and Włodarczak (2010: 63) suggested that they may actually represent miniature yokes for harnessing cattle. Other alternatives which could be advanced are that, like lunulae, they could be connected with solar boat-symbolism or that they may have been associated with Milky-Way/(rain)bow iconography. Le Quellec (2006: 715) has raised an interesting possibility concerning a potential relationship between the symbolism of archery equipment and serpentiforms. He noted that the possible arrow depiction at Île Longue has affinities with serpentiform motifs and this could indicate that these two motifs could have been assimilated. If this was this case, it could account for the apparent absence of zoomorphic serpentiforms in the Beaker artistic repertoire, apart from the serpentiform boars tusk pendant from Morocco (Bokbot and Ben-Nçer, 2006: 329, Fig. 4; Růžičková, 2009: 46), as a symbolic duality inferring 'serpent slaying' would have been associated with the arrows contained within the package of archery equipment.

5.11 Discussion

It has not been possible to engage with all of the symbols utilized during the Neolithic-Bronze Age (but the author is confident selection bias has been largely avoided), and in-depth discussion of the various motifs and their deployment both regionally and chronologically is not possible given the constraints imposed upon the current study. Nevertheless, it is apparent that if the iconography is approached from a mythological and cosmological perspective a degree of consistency and coherency is discernible with solar-journey narratives at their heart. From a chronological perspective it is evident that the narratives elucidated become progressively more

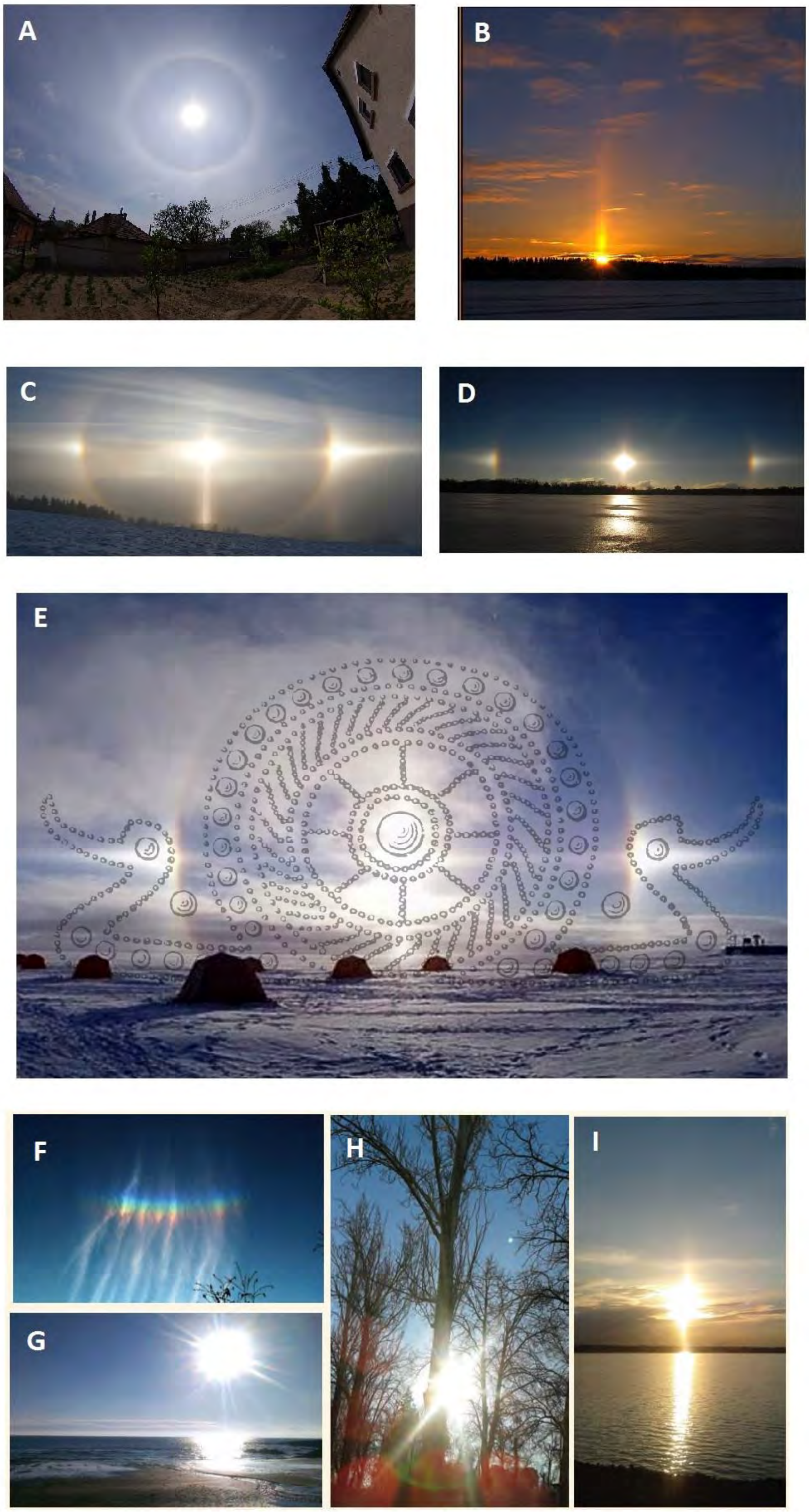


Figure 5.34: Selection of natural optical phenomena associated with the sun. (A) Sun halo (Pásztor, 2015: Fig. 3.); (B) Light pillar (Pásztor, 2015: Fig. 17.); (C) Round atmospheric phenomenon with four spokes (Pásztor, 2015: Fig. 7.); (D) Sun dogs on both sides of the sun (Pásztor, 2015: Fig. 13.); (E) Compound halo phenomenon, which may have been the inspiration for the solar boat symbol (Pásztor, 2015: Fig. 18.); (F) The sun as a circumzenithal arc; (G) the sun as zigzags; (H) Winter sun through trees (I) Setting sun on water, showing laddered effect (Cahill, 2015: Plate 4.)

complex during the course of the Neolithic-Bronze Age and in this context both regional and 'cultural' traditions appear to place enhanced emphasis on particular mythological aspects and varying combinations of symbols at different times.

At the centre of a lot of the imagery are possible sun and ship motifs and, as discussed recently by both Cahill (2015) and Pásztor (2015), the prominence of these particular symbols may be connected with their inspiration from, and association with, natural optical phenomena (Figure 5.34). There are numerous manifestations of the sun and variations its halo phenomena that can occur depending on atmospheric conditions, orientation and the presence or absence of clouds, rain or mist in the atmosphere. Such phenomena as sun pillars and light crosses, sun dogs (parhelia), crepuscular rays, halos and circumzenithal arcs may have influenced the way solar imagery was represented (Cahill, 2015: 27-28; Pásztor, 2015: 2). For instance, representations depicting concentric circles with a central spike may have portrayed sun pillars (Pásztor, 2015: 4) or the use of angled rays within/surrounding a circle may have expressed the idea of the sun rolling or 'wheeling' across the sky (Cahill, 2015: 28). Simple circles could have represented the 'daily' sun, while elaboration with concentric rings and dots could have eluded to corona or halo phenomena (including rainbow coloured rings), which can be produced by various atmospheric conditions. Rings of light around the sun can in fact be seen anywhere and at any time, but are also produced during such events as solar eclipses (Cahill, 2015: 28; Pásztor, 2015: 1-2). The wheel-cross motif featuring 'four spokes' could have represented a sun surrounded by a combination of atmospheric phenomena, such as a light cross (a sun with rays extending from the centre like four arms) and a halo, which are frequently observable at sunrise and sunset (Cahill, 2015: 28; Pásztor, 2015: 6). The 'solar boat' motifs could have had similar inspiration and Cahill (2015: 33) has highlighted such phenomena as the crescentic form of the sun during solar eclipses and the circumzenithal arc which produces what appears to be an upside-down rainbow resembling a narrow crescent, while Pásztor (2015: 5) points to occurrences of a combination of halo and sun dogs flanking the sun.

Although it has not been possible to investigate this hypothesis during the current study, it may be advanced that the different ways of depicting the sun could have been used to represent different 'versions' or 'aspects' of the sun, such as the day or night sun, the sun on its yearly journey, the mid-winter sun, the sun associated with the dark or light half of the year, the sun as connected with different seasons, or even the sun of 'infinite' or 'mythical' time. For instance, in it could be advanced that the spiral could have been employed to evoke the sun on its yearly journey or the sun of 'infinite' or 'mythical' time. It should of course be remembered however that circular and 'star-shaped' motifs could also have been utilized to depict other heavenly

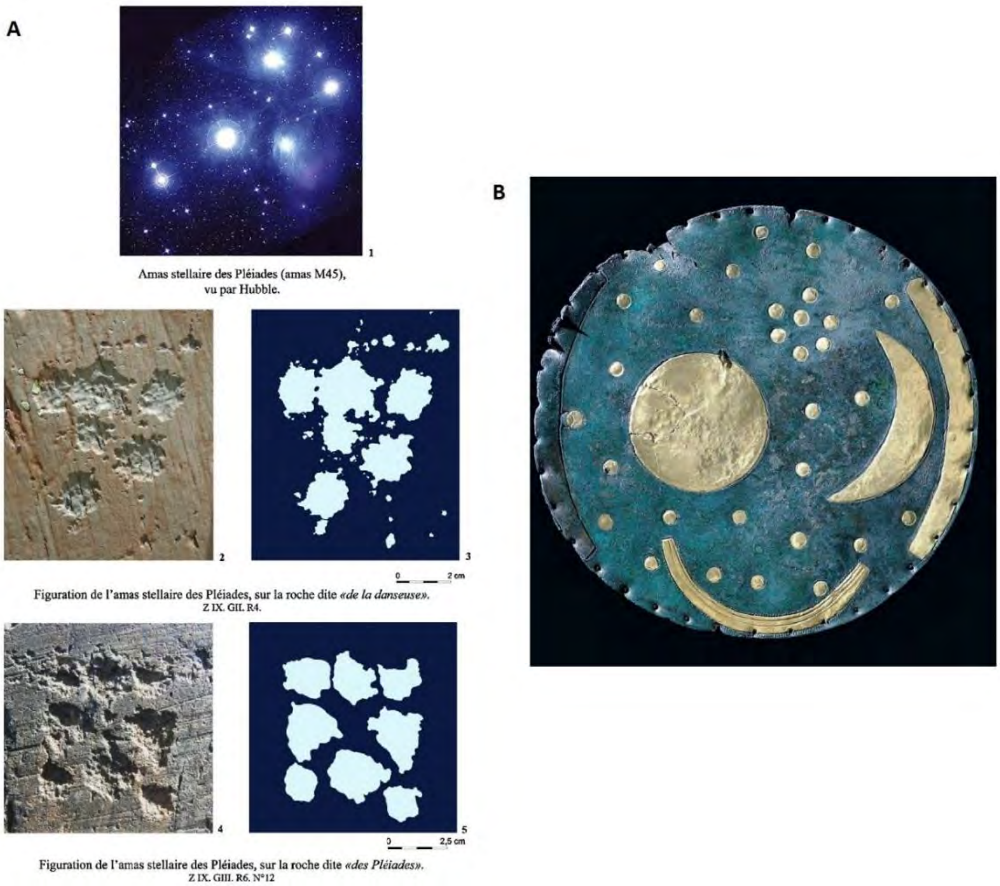


Figure 5.35: Depictions of the Pleiades star cluster. (A) Depiction of the Pleiades at Mont Bego (France).1: The stellar cluster of the Pleiades; 2-3: Depiction on the rock known as "the Dancer"; 4-5: Depiction on the rock known as "the Pleiades" (Echassoux, et al., 2009: Fig. 1.); (B) Bronze disc from Nebra (Germany) (Cahill, 2015: Plate 11a.)

bodies. For instance, depictions of the Pleiades (Figure 5.35) have been identified on the Nebra disc (Pásztor and Roslund, 2007: 271; Maraszek, et al., 2009 50-56) and at Mont Bego (de Lumley, et al., 2009: 998, 1000; Echassoux, et al., 2009).

There appears to be a degree of exchangeability between the use of marine and serpentiform iconography, but it may be suggested that although some of this appears to be regional or local preference, a connection with the elucidation of different aspects of related mythological narratives may explain some of the variation in time and space. Focusing on the serpentiform motifs their representation is often curved or angular and a connection between their form and water or river imagery is obvious (Green, 2002: 182, 224; Le Quellec, 2006: 695). This connection can only have been enhanced by the occurrence of water snakes and the seasonal appearance of eels within waterways, and in this context it is perhaps fitting that Le Quellec (2006: 715) noted that in 1916 Le Rouzic described the French serpentiforms as eels or congers, as it is feasible that eels were the primary reference (geographical variation in their presence withstanding). However, on the Continent snakes undoubtedly provided an additional (or in some regions alternative)

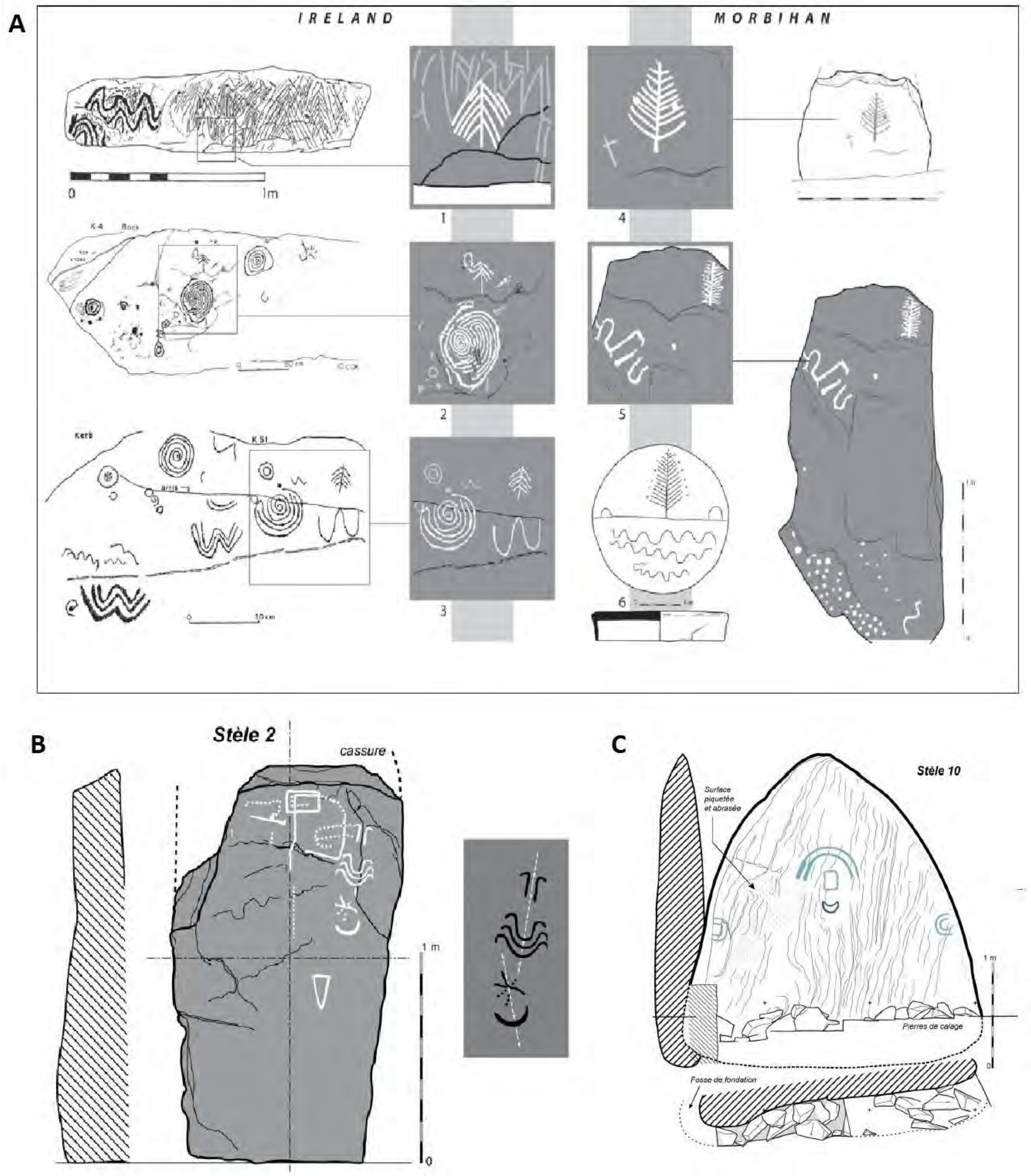


Figure 5.36: Examples of compositions in Irish and Breton megalithic art appearing to evoke a three tier cosmology. (A) Direct comparison of examples from Ireland (1-3) and France (4-6). (1) Knowth West, corbel 37/38; (2) and (3) Newgrange, kerbstones 4 and 51; (4) Guib, stele; (5) Table des Marchands, orthstat 3; (6) Lannec er Gadouer vessel. (B) Possible tri-partite representation on orthostat 10 in the Table des Marchands (Cassen 2011: Fig. 17.); (C) Possible tri-partite representation on Mané Lud orthostat 2 (Cassen 2011: Fig. 8.)

source of inspiration with their seasonal emergence from deep below the ground and by extension the water. As such, there may have been iconographic interchangeability between the depiction of eels and snakes, with a shared significance underpinning their representation.

The current author agrees with Nash (2012) that despite chronological differences the Neolithic megalith-using communities of Westernmost Europe (i.e. the north-western fringe of the

Mediterranean, the Atlantic seaboard and the British Isles) shared an artistic grammar and underlying ideology, with a degree of geographical and chronological differentiation involving such variances as the relative significance of certain symbols, motif style and associations. It is not feasible to restate these variations at length in the current context, but in terms of symbolic connectivity a number of examples illustrating connections between Ireland (and Britain), Brittany/France and Iberia may be reiterated. Firstly, unambiguous "representational" motifs are more common in Brittany/France and Iberia and their ostensible "absence" in Ireland can be explained chronologically. However, despite the chronological variations, serpentiforms and boats are common to all three regions and while the utilization of circular (including concentric and spiral variants) and rayed motifs suggest a greater affinity between Ireland and Iberia, they are not unknown in Brittany/France. This variation may be (partially) explained by a regional preference for the association of axe motifs and serpentiforms in Brittany, which from a mythological/cosmological perspective may allude to serpent slaying, while associations between possible solar symbols and serpentiforms are evident in Ireland and Iberia. The somewhat rare depictions of whales may also occur in all three areas, but their identification is most ambiguous in Iberia. Although the 'ramiform' or 'arboriform' motif is found in Iberia, Brittany and Ireland, their association with serpentiforms indicates particular affinities between the latter regions.

Representations of tri-partite division are also apparent in both Brittany and Ireland (Figure 5.36). In simple form this concept appears to be represented by 'arboriforms' resting directly on natural horizontal cracks on Newgrange 1 k4 and Knowth 1 West co37/38 in Ireland and on the menhir at Guib (Morbihan) in Brittany, and the depiction of serpentiforms below 'arboriforms' at Newgrange 1 (c3, rs3). A combination of these occurs on the Castellic vessel from Lannec er Gadouer (Morbihan) and Table des Marchands orthostat 3 (Morbihan) upon which 'arboriforms' rest upon horizontal planes below which serpentiforms are depicted. More complex compositions illustrating the same idea occur on Newgrange 1 k4 where a solar-spiral variant is depicted below an 'arboriform' resting on a horizontal crack and on k51 which features both a serpentiform and a boat 'carrying' a 'solar-spiral' (possibly beginning emerge above the 'horizon') on the lower plane and on the upper plane an 'arboriform', a 'solar-concentric circle' and a 'meandering line' (possibly a serpentiform or even a stylized avian image) (Cassen, 2000a: 718, 721; Robin and Cassen, 2009: 854-855; Robin, 2012: 144-145). Tri-partite cosmology also appears to be represented on Table des Marchands orthostat 10 (Cassen, 2007: 227, 232, 2011: 50-51) where a Milky Way/rainbow motif occurs above a quadrangle, interpreted as a representation of 'land' (Cassen, 2007: 240-244, 2011: 18-19), and an 'empty' boat, and as noted above a similar composition may occur on Dowth North (c19) in Ireland. Mané Lud orthostat 2 may also be

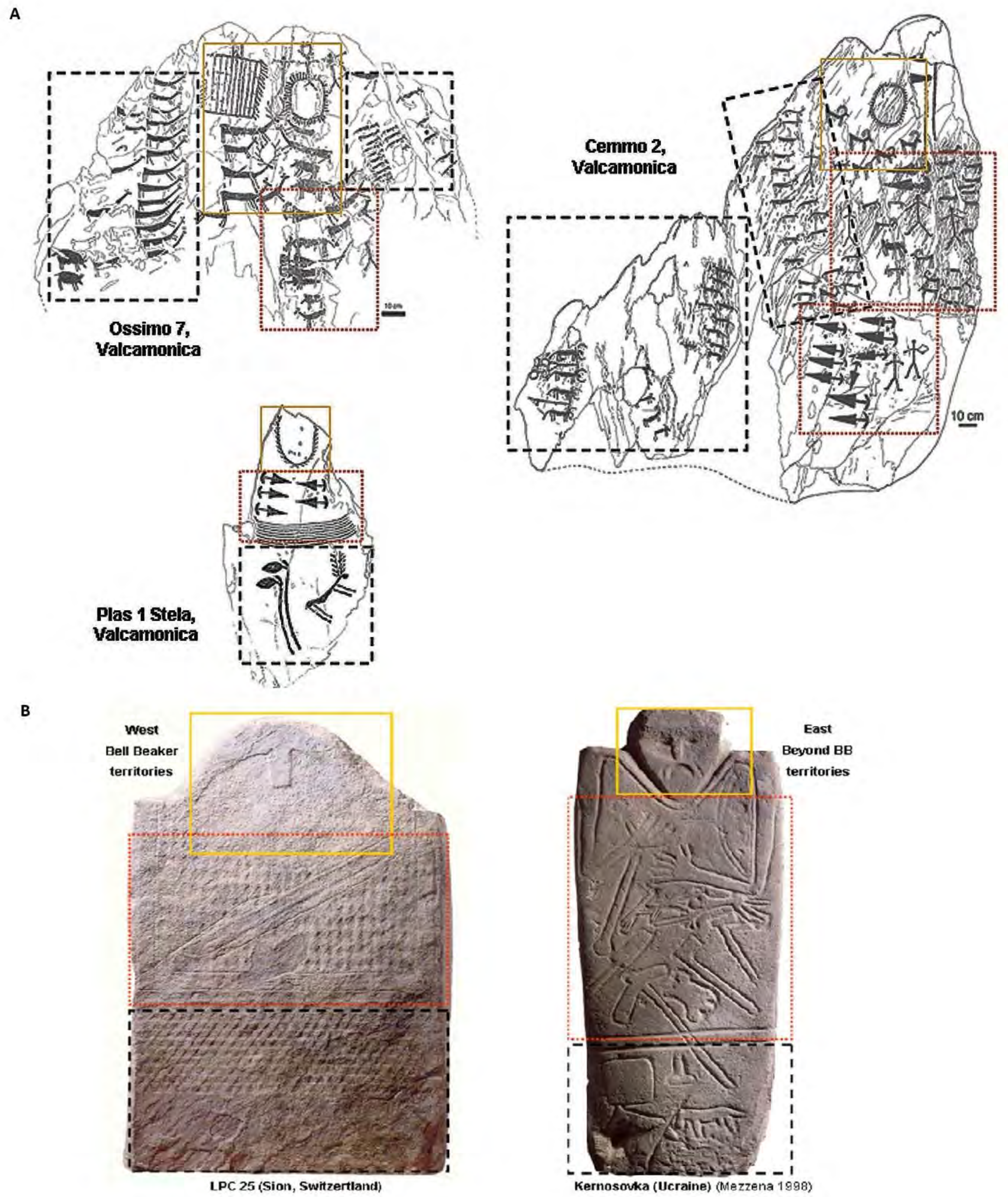


Figure 5.37: Compositions suggested to evoke three tier cosmologies. (A) Rock art carvings from Valcamonica (Italy) (adapted from Prieto Martínez, 2013: Fig. 6.); (B) Representative steles from two areas in the European continent: West vs. East (adapted from Prieto Martínez, 2013: Fig. 4.)

highlighted in this context as it features a triangular axe blade on the lower part of the stone (which may allude to serpent slaying) and on the right-hand side, a pair of crozier/crook/lacrosse symbols are situated above three nested 'birds', a 'solar rayed motif' and a boat (Cassen, 2011: 26-27). A similar explanation may be attributed to Gavrinis orthostat 8 which features a pair of double arcs (possibly representing a Milky Way and rainbow or pair of rainbows) flanked by a 'crozier/crook/lacrosse' motif on one side and an axe-motif on the other on the upper plane, and

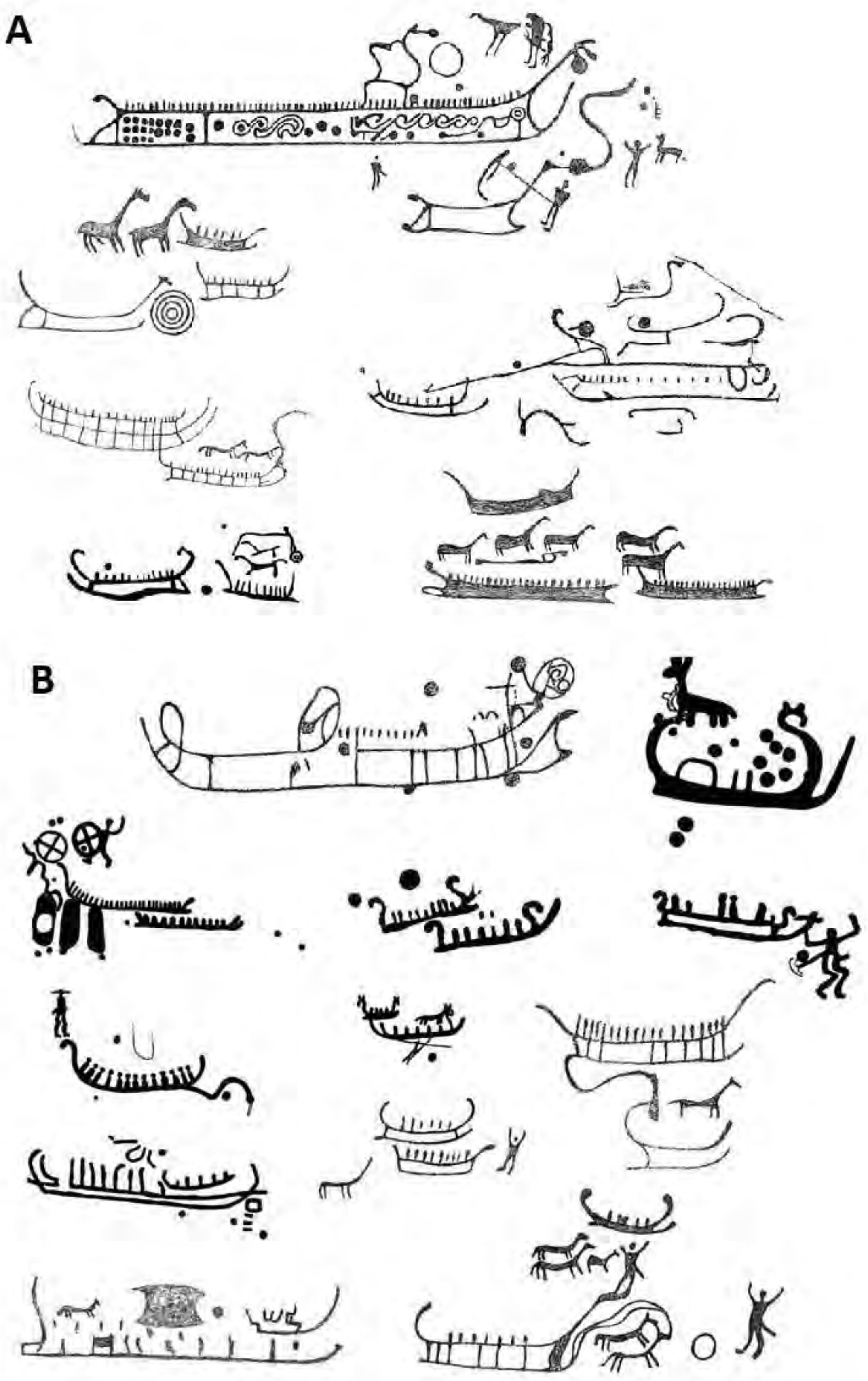


Figure 5.38: Examples of elaborate cosmological concepts articulated in Scandinavian rock art. (A) Examples of day ships and the transition from night to day ship (Kristiansen, 2012: Fig. 6.9.); (B) Examples of the transition from day to night ship, and the landing of the sun horse (Kristiansen, 2012: Fig. 6.10)

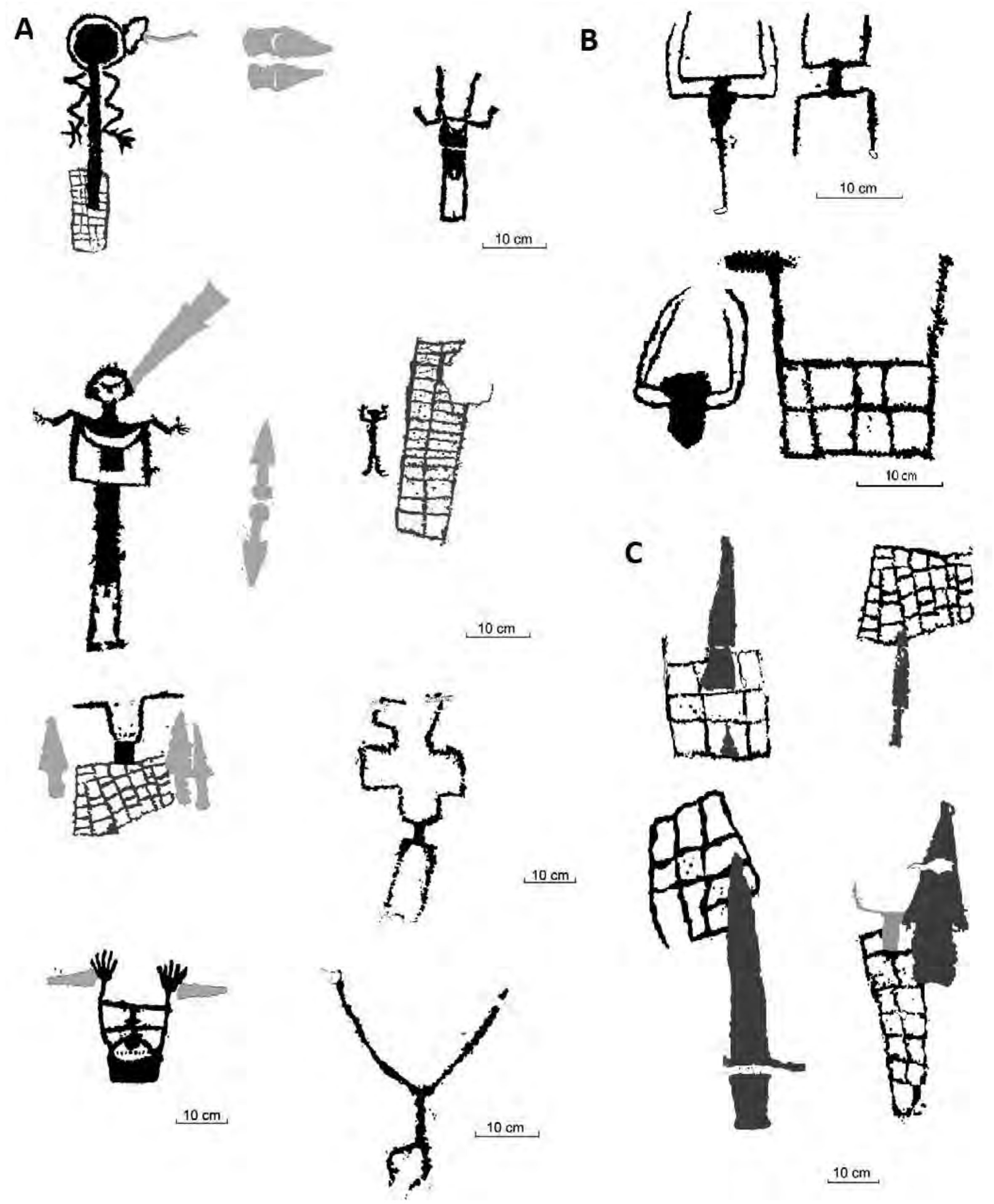


Figure 5.39: Depictions of Father Heaven and Mother Earth at Mont Bego (France). (A) Representation of the divine primordial couple: the bull god or god of storms and the high goddess or goddess earth (de Lumley, et al., 2009: Fig. 7.); (B) Representation of the divine primordial couple: the bull god, symbolised by a corniculate with a double pair of horns (the divine bull) and the high goddess (de Lumley, et al., 2009: Fig. 8.); (C) Daggers overlapping a reticulate representing the earth (adapted from de Lumley, et al., 2009: Fig. 11.)

a combination of three vertical serpentiforms and three axes on the lower plane (Cassen, 2000a: 721).

The increasing complexity of tri-partite cosmology and the presentation of associated mythological narratives by copper-using communities from the later 4th and the 3rd millennium BC

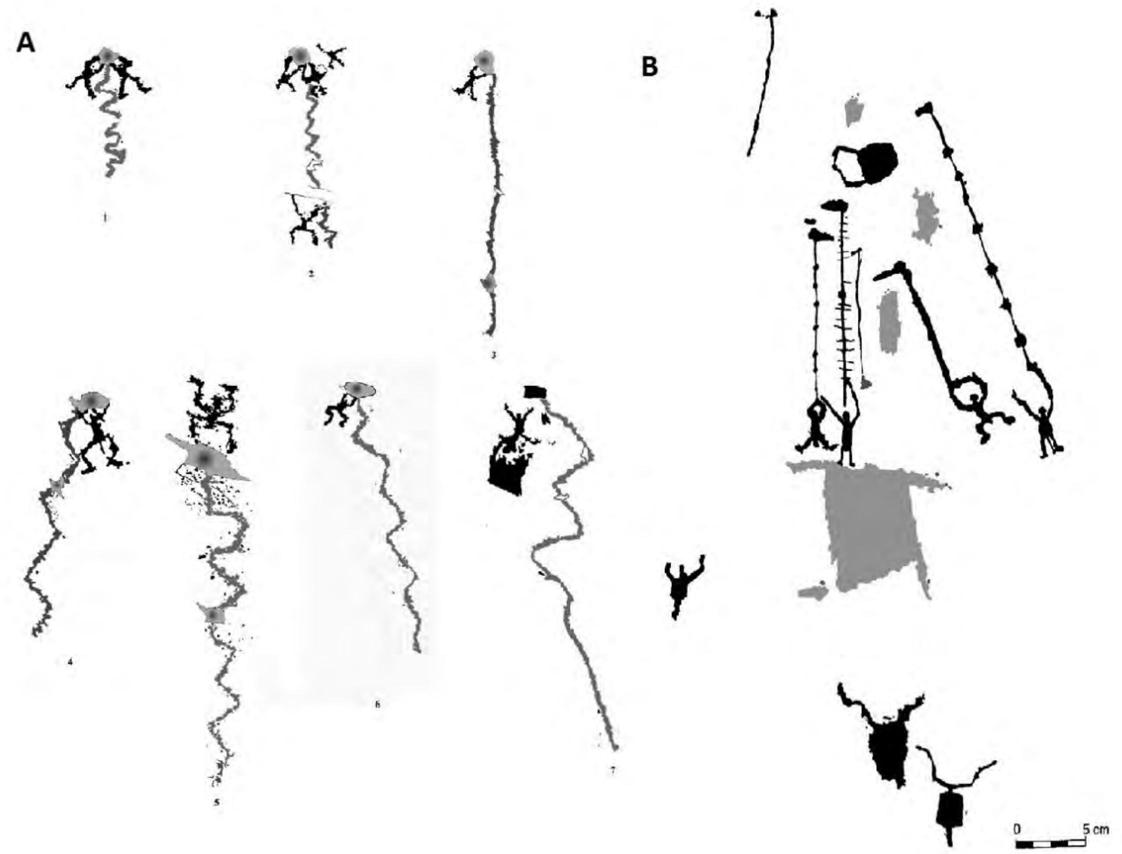


Figure 5.40: Scenes depicting the release of water to fertilize the land at Mont Bego (France). (A) Figures making water spout from the rock (1-6) and figures making water spout from a 'water basin' (7) (de Lumley, et al., 2009: Fig. 16.); (B) Figures below a 'water basin' brandishing halberds above their heads to make the rain fall. (de Lumley, et al., 2009: Fig. 17.)

is evident at Valcamonica and Valtellina in northern Italy (Figure 5.37) in compositions at such sites as Bomo 4, Ossimo 7, Capitello dei Due Pini (Paspardo) and Bagnolo 2 (Frachetti and Chippindale, 2002; Fossati, 2007: 143-144; Anati, 2008: 22-30, 2009: 943-944, 948, 955; Woudhuizen, 2010; Prieto Martínez, 2013: 228-230). The current author has argued that is it feasible that the motifs utilized on statue-menhirs carried additional cosmological associations, but disagrees with suggestions that tri-partite cosmological structure is evident in their form as argued by some researchers (Figure 5.37; e.g. Anati, 2008: 29-30; Prieto Martínez, 2013: 227-228). Towards the end of the 2nd millennium BC (beginning c. 1200 BC) new elements suggestive of growing mythological complexity were incorporated into the iconography of the Valcamonica region (Anati, 2009: 958).

As noted recently by Cahill (2015: 30) during the 2nd and 1st millennia representation of the solar journey in rock art and its associated mythology became progressively more complex in Scandinavia (Figure 5.38). In the earliest depictions, c. 1700 BC, the sun is carried on a boat so that it can complete its diurnal and nocturnal circuit of the earth and the underworld and over time

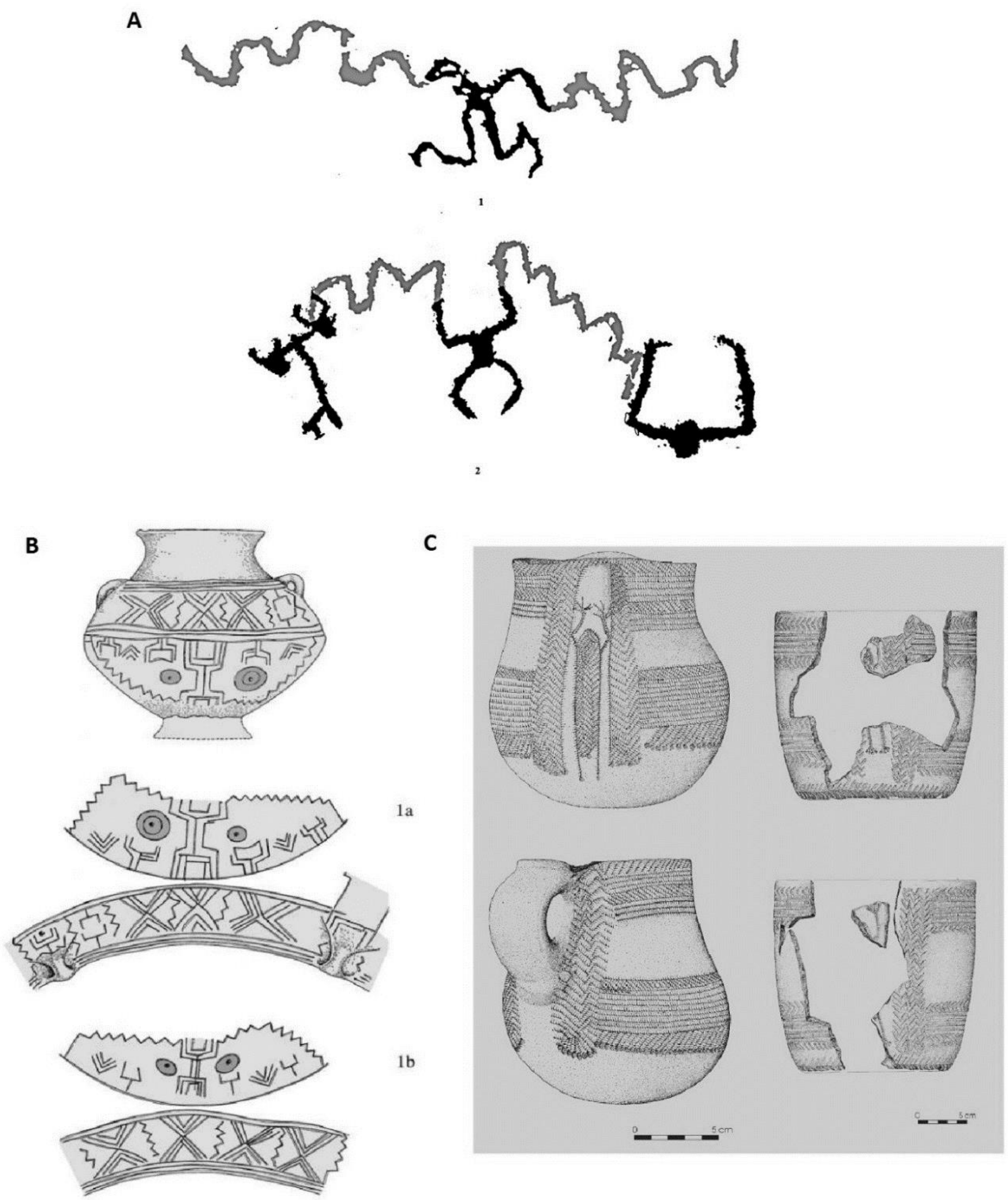


Figure 5.41: Possible representations of a creation myth. (A) Figures interpreted as the high goddess, mother goddess or goddess earth with sinuous lines, suggested to represent streams of water, emanating from her arms. (adapted from de Lumley, et al., 2009: Fig. 15.); (B) The Nagyrév culture vessel from Pannonhalmi Road, Győr-Moson-Sopron, (Hungary) with its decoration folded out (adapted from Endrődi and Pásztor, 2006: Fig. 6.1); Possibly similar scenes depicted on Cardinal pottery from Cova de l'Or, Alicante (Spain) (Martí Oliver and Juan-Cabanilles, 2002: Figs. 1-2.)

additional elements were introduced, including the incorporation of cattle which were replaced by horses and subsequently birds, in addition to fish, serpentiforms, the 'Divine Twins', 'adorants', etc. (Gelling and Ellis Davidson, 1969; Kaul, 1998, 2014; Kristiansen, 2012, 2014; Melheim, 2013; Ling and Rowlands, 2015).

There may also be elaboration in the way Father Heaven/Mother Earth narratives were articulated iconographically. As noted above this idea may have been expressed within compositions featuring 'solar symbols' such as spirals and wheel-crosses and female 'goddess' figures on pottery in southeast Europe between the 6th and 4th millennia BC. More complex articulation of this concept occurs in the Mont Bego rock-art region c. 2500-1800 BC (Figure 5.39). Here depictions of anthropomorphic figures and daggers overlapping a rectangular/quadrilateral motif (interpreted to represent land), depictions of paired male and female anthropomorhs and cattle, the 'goddess' giving 'birth' to a 'corniforms' (Thomas, 2003: 276; de Lumley, et al., 2009: 980-986) evoke fertility and the fertilizing effects of water upon the land (de Lumley, et al., 2009: 986-991).

Similar connotations may have been evoked by anthropomorphs, corniforms and 'plough teams' associated with daggers and/or meandering lines/zig-zags, interpreted as symbolizing torrents or channels of water irrigating the land. The release of water is also connected with anthropomorphic figures, sometimes bearing halberds, depicted in the act of bringing water forth from a 'rock' or 'water basin' (Figure 5.40). It may also be notable that among these there are depictions of anthropomorphs with raised arms from which emit meandering lines (Figure 5.41), i.e. from which streams of water flow (*ibid*.: 988, Fig. 15.1-2). These figures echo a Nagyrév Culture (c. 2200-2000 BC) pot from Pannonhalmi Road (Győr-Moson-Sopron) in western Hungary which, when viewed in an inverted position, depicts a stylised human figure with raised arms from whose hands water runs (zigzag lines), flanked by stylized representations of plants, the sun and moon (or a double sun). This scene has been interpreted as symbolic depiction of a creation myth wherein water runs from the hands of the figure and the earth and water become separated from the sun and moon (Schreiber, 1984: 14-16, 25-26; Endrődi and Pásztor, 2006: 13).

5.12 Conclusion

From a European perspective some general geographical and chronological trends are apparent in the occurrence of many of the primary symbols that have been discussed in this chapter. Furthermore, the geographical and chronological patterns and trajectories emerging in studies of isotopes and aDNA appear to show similar idiosyncrasies indicating that there may be validity to the suggestion that both regional and 'cultural' traditions appear to have placed enhanced emphasis on particular mythological aspects and varying combinations of symbols connected with the representation of cosmological and mythological narratives in different periods.

It has been argued in this chapter that the various possible 'solar symbols' arrived in South-Eastern and parts of Central Europe with the initial spread of the Neolithic. These occur to varying degrees alongside bovine, avian and serpentiform symbols in the symbolic repertoire from the earlier Neolithic. In Northern Europe and France boat, marine and serpentiform and, to a lesser degree, solar symbols appear prominent in Neolithic repertoires. It should be noted that cattle imagery was also present in the artistic repertoire of France during the initial Neolithic, but definitive symbolic representation at least appears to have disappeared before the middle of the 4th millennium BC. Bovine and solar symbolism occurs from the earlier stages of the Neolithic in Alpine and Western Mediterranean areas, with serpentiform and potentially marine iconography also occurring in the latter region. It may also be significant that rayed motifs appear regularly in these areas, but are largely absent in northern Europe and France. Conversely, boat representations are only rare occurrences in Iberia. Irish megalithic art shares elements of 'artistic grammar' with both the French and Iberian iconographic repertoires, suggesting ideological influences were arriving in Ireland from two directions during the Neolithic. The presence of rayed motifs in Irish art suggests a greater affinity between Ireland and Iberia, as do associations between possible solar symbols and serpentiforms. Connections with France are evident in possible boat representations, in addition to the combination of serpentiform and 'ramiform' or 'arboriform' motifs, and possible depictions of tri-partite ideology.

Notably, studies of aDNA appear to support a broad two-fold Neolithic migration process spreading via a northern route which followed the Danube River into and through Central Europe (Haak, et al., 2005, 2008, 2010; Bramanti, et al., 2009; Deguilloux, et al., 2011, 2012; Fu, et al., 2012; Brandt, et al., 2013; Brotherton, et al., 2013; Gamba, et al., 2014; Szécsényi-Nagy, et al., 2015) and a southern Mediterranean route (Izagirre and de la Rúa, 1999; Sampietro, et al., 2007; Di Benedetto, et al., 2000; Lacan, et al., 2011, 2011a; Gamba, et al., 2012; Hervella, et al., 2012; Ricaut, et al., 2012; Behar, et al., 2013; Olalde, et al., 2015). Furthermore, during the 5th (and 4th) millennium BC far reaching communication networks are known to have crossed Continental Europe (e.g. reaching from the Atlantic Coast almost to the Caspian Sea) and both the exchange of material culture and shared iconography are apparent (e.g. Cassen, 2003, 2012a: 1335-1336; Heyd, 2012: 107-109; Pétrequin, et al., 2012c; Vander Linden, 2012: 73; Chapman, 2013).

A secondary spread of the solar 'wheel cross' and potentially solar boat symbolism connected with crescent-shaped necklaces appears to have begun in the eastern half of Europe in the later stages of the 4th millennium BC and subsequently spread towards the Alpine and Western Mediterranean region. These symbols appear to have become widespread during the course of the 3rd Millennium BC, most notably in the context of the Beaker phenomenon. Increasing complexity in the representation of tri-partite cosmology and the presentation of solar journey associated mythological narratives with the addition of new elements occurred across Europe during the later stages of the 3rd and throughout the 2nd millennium BC. To pick out a few examples, within the artistic repertoires of both Scandinavia and the Alpine region evidence indicates the replacement of cattle with horse symbolism during the mid-2nd millennium BC, while a rise in the prominence of solar boat and wagon symbolism is evident in Central and Eastern Europe and a secondary spread of bird symbolism into Western and Northern Europe occurred during the second half of the 2nd millennium BC.

The combination of aDNA (Brandt, et al., 2013; Allentoft, et al., 2015; Haak, et al., 2015) and isotope (Haak, et al., 2008; Kern, 2012) evidence suggests potentially large-scale migration into Central Europe from the Carpathian basin and/or Pontic region during the early 3rd millennium BC and similar evidence (Price, et al., 2004; Desideri, 2008, 2011; Desideri, et al., 2010; Kern, 2012; Lee, et al., 2012; Ricaut, et al. 2012; Brandt, et al., 2013; Brotherton, et al., 2013) indicates mid-3rd millennium BC migration from the south-west of the Continent both northwards and north-eastwards through the Alpine region to Central Europe followed by a secondary reflux towards Iberia. Given the widespread and inter-connected iconography demonstrated in this chapter, it may be advanced that cosmological, mythological and 'religious' ideas also travelled these routes and that these were negotiated, reconciled and adapted to form ideological variants at 'cultural', regional, and local levels.

6 The Birth of Maccan Óc: An Irish variant of a widespread story

6.1 Introduction

Following discussion of Indo-European mythology and cosmology connected with the daily journey of the sun in the preceding chapter, the current chapter focuses on the nine-month yearly solar journey from the spring equinox to the winter solstice. The Irish 'Birth of Maccan Óc' myth connected with Newgrange is the central focus. The main protagonists of the Irish myth, the skyfather, river/earth goddess, their son, and the goddess' brother/husband, are contextualized within wider Indo-European traditions with a view to demonstrating that they represent local versions and are cognates for deities found across the Continent. It is advanced that echoes of aspects of a more widespread myth connected with the yearly solar journey and the winter solstice are present in the 'Birth of Maccan Óc' tale. In support of this theory a number of Eurasian myth variants displaying clearly similar structures, some connected with 'religious' or 'ceremonial' calendars and others with 'economic' calendars, are outlined.

6.2 Medieval tradition, time-depth and Brug na Bóinne

Within medieval tradition Brug na Bóinne was recorded as the dwelling place of the Tuatha Dé Dannan, including the Dagda and his son Óengus (Waddell, 2014: 55; Sherwood, 2009: 202). Waddell (2014: 55) raised the point that O'Kelly (1982: 43-48) thought it possible that Newgrange's association with the chief of the gods and his son was the reason for the enduring sanctity of the monument and its focus as an offering place in Roman times. Waddell stressed that the story of Newgrange begins with the mythology associated with the River Boyne and the identification of connections between these and the yearly visitation of the sun to the tomb. He also drew attention to the possibility that European cosmological ideas associated with the solar journey were present in Ireland during the Bronze Age and maybe even the Neolithic. Swift (2003) has argued that the gods and mythology described in the medieval literature reflects the late prehistoric belief system, but that the narratives and figures are no older than the late Iron Age/Roman period. The current author would agree that the medieval texts are based upon Iron Age narratives, but contra Swift (2003) would argue that the Iron Age narratives have their origin in the LBA. The identification of deities with horses for example suggests that the Irish pantheon, such as it was recorded, cannot be any older than the MBA when horses appear in the archaeological record (see McCormick, 2007b; Bendrey, et al., 2013), and as was witnessed elsewhere in Europe, gained ceremonial importance and were undoubtedly integrated into the mythology. However, it may be proposed that associations between Irish deities and cattle symbolism have greater time-depth and that the belief system of the later Bronze Age has its roots in the earlier Bronze Age and ultimately the Neolithic, as may be identified by the continuities of practice visible in the archaeological record.

As highlighted by Vansina (1985) while oral traditions and mythologies will be renewed and kept 'current' over time in the way they are framed, the underlying and most important messages contained in mythologies and cosmologies which are imbued with symbolic significance remain at the heart of traditions and may be comparatively stable over time. In terms of prehistoric Irish mythology or cosmology there is no reason to argue that there was thousands of years of perpetual continuity from the Neolithic though to the Iron Age. Rationally, there will have been periods of renewal and change in which belief systems were modified, but an overarching form of additive continuity may be advanced. Thus, comparatively short periods of mythological and cosmological continuity characterized by broadly minor changes and additions, perhaps lasting c. 200-300 years, may be envisaged. These periods will also have been punctuated by what could be termed cosmological and/or mythological revolutions during which the composition of pantheons may have been altered, symbolic associations with deities' modified, and generally relatively abrupt infusions of greater complexity into the belief system. Vansina (1985: 187-190) drew attention to the difficulties of correlating events and situations described or recounted in traditions with an archaeological site or landscape. In addition, a link between tradition and an earlier site can be forged, and in such cases the strength of the association is generated by the singicance the site gains witin the new tradition. It appears that Swift (2003) believes that this is the case with Newgrange and its associations with the solar cycle and the figures represented in medieval literature. It will be argued below that echoes of earlier prehistoric tradition are in fact contained within the Birth of Maccan Óc story connected with Newgrange, and that this represents an Irish version of the winter solstice associated cosmological myth found across Eurasia and attested in Egypt during the 4th/3rd millennia BC.

6.3 Birth of Maccan Óc Myth

The tale of the conception and birth of Óengus Mac ind Óc (the "Young Son") and the creation of the River Boyne are contained within a number of Irish texts although minor details and the names (bynames) utilized vary between the extant sources. The tales of Bóand-I and Bóand-II recount the tale of Nechtain's well in the 11th century *Dindsenchas*, but only the latter, puts the story in its proper juxtaposition with the birth of Óengus. The story of Bóand-II is related in greater detail in *Tochmarc Étáine* from the *Yellow Book of Lecan* which may date back to the 9th

century, and in the poem on *Bruigh na Bóinde* composed by Cináed úa hArtacáin (d. 987 AD) which was preserved in the 12th Century *Book of Leinster*. An "alternative" version of the story, but which shares important details with both Bóand-I and and Bóand-II indicating that it is in fact an account of the conception of Óengus appears in *Cath Maige Tuired* (for greater detail about these variations of the story see Olmsted, 1994: 187-192, 207-209).

Combining these variations of the story, the tale of the conception and birth Óengus Mac ind Óc and Nechtain Well/the creation of the River Boyne can be recounted thus. Bóand, wife of Nechtain and the Dagda arrived at Newgrange for a love-tryst (the mound being the dwelling of Bóand husband or brother, Nechtain or Elcmar depending on the version of the story). Bóand falls pregnant and the Dagda finds a pretext for sending Elcmar/Nechtain on a journey to visit Bres mac nEalathan where he is to be wined and dined. The Dagda then bewitches Elcmar/Nechtain so that over the course of nine months he will not be hungry or perceive night (i.e. he makes the sun stand still) so that he will think that he has been away for only one day. Thus Bóand could deliver the child conceived of the Dagda without Elcmar/Nechtain finding out that she had been pregnant. Furthermore, because the Dagda "made the sun stand still to the end of nine months", Óengus Mac ind Óc was said to have been born "in a single day", as he "was begotten at the break of day and born between it and evening". This mating took place on the first day of winter i.e. Samhain (note: cosmological traits connected with the winter solstice throughout Eurasia were moved to Samhain in Irish tradition, so it may be safely deduced that this reference implies mid-winter). Then in order to preserve Óengus' safety the Dagda has the boy sent off at birth to Midir in Brí Leith who raises him until he is nine years old. Feeling guilty about the affair Bóand goes to Nechtain's well in order to purify herself by bathing in it. Alternatively, on his journey back at "the completion of nine months, when the sun at last went down" Elcmar/Nechtain noticed "that a strange ripeness was across the fields" and that "the bloom on all the flowers had changed". He accuses Bóand of having slept with the Dagda, but she swears that she has not and will walk around Nechtain's well three times counter-clockwise to prove her chastity beyond doubt. When Bóand reaches the well and tries to bathe/prove her chastity the water of the spring rose and a fountain formed. Then three waves disfigured Bóand (damaging her foot, hand and eye) and proceeded to rush in pursuit of her across the landscape to the sea forming the course of the River Boyne. Bóand had a lapdog (called Dabilla) which followed after her as the river chased her to the sea. When they reached the sea, the water overtook both Bóand and her lapdog.

The manipulation of time plays an important role within this story as Elcmar/Nechtain is away from Newgrange for nine months, but perceives it to have occurred over the course of a day, as is the duration of Bóand's pregnancy. Óengus Mac ind Óc is also said to have been conceived and born during the course of a day, in fact being said to have been "begotten at the break of day and born between it and evening" in the *Dinsenchas* Bóand-II version of the tale. The manipulation of time also features prominently in the various accounts of how Óengus Mac ind Óc gained possession of the Newgrange mound (Olmsted, 1994: 192; Waddell, 2014: 22-24). These include *De Gabail in tSída* (The Taking of the Otherworld Mound) in the *Book of Leinster* (12th Century), *Tochmarc Étaíne* (The Wooing of Étaín) from the *Yellow Book of Lecan* (9th Century) and *Altram Tighe Dá Mheadar* (The Fosterage of the House of Two Vessels) contained in the *Book of Fermoy* (14th Century). Although there are differences in the details of the two earlier versions of this tale they both recount that when he reached nine years of age Óengus is granted the Brug for a night and a day but takes possession of it, declaring that night and day are equivalent to eternity as they make up the whole of existence. In the third tale Óengus gains the Brug by placing Elcmar under an enchantment that will last until the end of time.

6.3.1 The Dagda: the Irish Sky Father and Indo-European Cognates

An obvious connection between the periodic penetration of sunlight into Newgrange and solar mythology is the monument's strong mythological association with the Dagda who, among his various manifestations, was a paternal-type solar deity and was also renowned for his wisdom and sexual prowess (Waddell, 2014: 30; Sherwood, 2009: 202-203). Bynames for the Irish Skyfather (Olmsted, 1994: 181-186) are listed in Table 6.1 and a number of these will be referred to in this and the following section (6.3.2). Comparing Irish with Indo-European gods is hindered by the fact that in various traditions attributes were transferred from one deity to another, divine figures were variously combined and separated, and the roles of certain gods were altered making simple one to one comparisons difficult. This difficulty is particularly evident when considering Indo-European correlates for the Dagda, who in actuality shares attributes with both Vedic Dyāuḥ and Índraḥ (Olmsted, 1994: 89; Waddell, 2014: 30; Sherwood, 2009: 203). Although there are relatively unambiguous correlatives for the Irish "sky father" such as Sanskrit/Vedic Dyāuḥ and Dyāuṣpitā, Latin Iuppiter and Diēspiter, Old Latin Diovis and Illyrian Deipatyros (Olmsted, 1994: 75-76), there are other examples which are more complicated, as can be demonstrated by examples from Greek and Norse mythology. For example, the Mycenaean Linear B tablets from Pylos record Poseidōn (who also features prominently in all early regional Greek traditions), rather than Zeús as the chief deity and "sky father". In addition, the name Poseidōn (Doric Poteidán) appears to be a combination of pósis "husband" and dā (dan) "earth" reflecting his role as the consort of Dēmētēr (Damátēr) the "earth mother" as recorded in Dorian and Arcadian tradition (Burkert, 1985: 44; Olmsted, 1994: 73-75; Voyatzis, 1998: 142-143). In addition, Olmsted (1994: 75-76, 89) has suggested that Zeús, meaning "lumionous (sky), the heavens or the

Irish Deites and some of their Indo-European Cognates	
Dagda “sky father”	Proto-Indo-European: *dj̯ēuspətēr “sky father”; Sanskrit and Vedic: Dyāuḥ and Dyāuṣpitā (voc. Dyàuṣpítaḥ) Latin: Iuppiter; Latin: Diēspiter (Vēdiovis: underworld god); Old Latin: Diovis; Illyrian: Deipatyros Mycenaean: Poseidōn Greek: Zeùs Patēr
Bóand	Sanskrit: Go-vinda Gaulish Cognates Bovinda (Bovovinda) “the White Cow”; Matrona “Mother/Matron”; S(t)irona “the Heifer”; Damona “the Cow”; Ald[a]me[…]s “?the White Cow of…?”; Bormana *Borobovindona “the Boiling White Cow, the Boiler”; Borvobo(v)endo(n)a “the Boiling White Cow”; Matuberginnia “the Good High One”; Dea Mogontia “the Youthful” Rīgana “Great Queen” Souconna “the Suckler/Flowing” Sequana “the Flowing” Welsh Cognate Modron “Mother” (< Matrona);
Nechtain/Fraech	Gaulish Cognates Grannos “(God of) Hot Springs, the Warm/Brilliant”; Bormo “the Boiler/Bubbler”; Albinos “the Fair”; Vroicos “the Heather”
Mac ind Óc (*Maccan)	Gaulish Cognates Maponos “the Son”; Mapon(on) Arveriiatin “the Son, (Born) of the Passion of Waters”; Maponos Arveriiatis “the Son (Born of) Passion of the Waters”; Welsh Cognate Mabon “Son” (< Maponos)

Table 6.1: Irish deites and some of their Indo-European cognates (adapted from Olmsted, 1994)

luminous day”, represents a composite figure whose position in the Mycenaean pantheon corresponded developmentally to Vedic Váruṇaḥ, but in Hellenistic Greece acquired additional attributes associated with Vedic Dyāuḥ and was elevated to the role of “sky father”, as evidenced in the designation Zeùs Patēr. Like Hellenistic Zeús, Norse/Germanic Óðinn is a composite figure who (like Zeús) relates functionally to Dyāuḥ and Váruṇaḥ (Olmsted, 1994: 89). Furthermore, it appears that during the Late Iron Age the chief god and father figure was Þórr (i.e. Thórr) in most of western Norway and Gotland, a deity who also had the central position in Uppsala, Hlaðir and Gudbrandsdal (Gunnell, 2012: 136). Óðinn was however mentioned indirectly in 98 AD by the

Roman historian Tacitus, so he was clearly a Germanic/ Scandinavian deity during the Iron Age, but like Zeús in Mycenae, was not the most prominent divinity in the pantheon. Available evidence and mythological narratives indicate that Óðinn's elevation to the position of chief god and "alföðr" began during the 5th and 6th centuries AD and his associated characteristics may have been shaped by interaction with the Roman world (Andrén, 2005: 128-129).

6.3.2 Cattle Symbolism and the union of the Skyfather and Earth Mother

Within Egyptian tradition the mating of the heavens and earth was conceptualized simultaneously in terms of the joining of man and woman, and as a bull mounting a cow. In this context the River Nile was seen as fertilizing sperm which overflows its banks to fertilize the soil seasonally, and more generally the rain was seen to fertilize the ground (Renggli, 2002: 4). In Egyptian mythology there was 'cross-identification' between the goddesses Isis, Nut, Hathor and Neith among others, all of whom were represented symbolically as cows and within both Predynastic and Dynastic art they were commonly depicted as nursing heifers (Hassan, 1998: 100-101, 106). It has been argued (Hassan, 1992, 1998: 105) that the concept of a cow-goddess in Dynastic Egypt was a continuation of a much older tradition of a primordial cow goddess (or goddesses) with Neolithic origins. The connection between water, cattle, milk, and women lies in their common links with regeneration and as sources of nourishment. Connections between creation, rebirth and death were also attached to the seasonality of Nile floods and the agricultural cycle, as the waters give birth to life. In addition, when the river waters recede the land is left 'thirsty' and 'dead' until the return of the fertilizing Nile inundation and flooding (Hassan, 1998: 106-107).

Similar ideas and the utilization of cattle symbolism in this way is apparent elsewhere and in almost all Indo-European linguistic cultures, the original Sky Father shows great sexual potency to fertilize Mother Earth and is able to bring great abundance (Olmsted, 1994: 98). For instance, in Vedic tradition the Sky Father, Dyāuḥ (Sky) is the progenitor of many of the gods and all of them are born of Áditiḥ, the Waters, otherwise referred to as "earth" (Pṛthivī) or "cow" (Gáuḥ). The Vedas liken Dyāuḥ to a bull who bellows downwards from the heavens (i.e. thunder) and is rich in seed (i.e. rain) (*ibid*.: 63-65). Another example comes from Mycenae/Greece where Poseidōn, the "Bull-god" as described by Hēsíodos, was (as stated above) the consort of Dēmētēr (Damátēr) the "earth mother", also referred to as Sitopotinija "Mistress of Grain" (among other names and epithets) in the Mycenaean Linear B tablets. Poseidōn is also referred to by such epithets as the "Shower of Dēmētēr's Temple" (Dēmētros Synnaos), "Nourisher" (Phytálmios) and "God of Waters" (Krēnouchos), and he could call forth the stream from a rock with a single stroke of his trident (Burkert, 1985: 44; Olmsted, 1994: 73-75; Voyatzis, 1998: 142-143). In the Celtic world bulls were associated with power, virility and aggression, attributes which were perceived as entirely positive and connected with fertility and beneficence. In France Iron Age symbolic associations with bulls include the tribal name Taurini, meaning the "bull tribe" and the town of Tarbes meaning "bull town" in southern Gaul and the regenerative aspects of the beast are indicated by its symbolic link with healing sanctuaries (Green, 2002: 220). It is not certain that only one deity is represented by the Romano-Gaulish portrayals of Iuppiter the Sky Father, but it may be notable the epithets Tanaros and Taranus, meaning "thunderer" (Olmsted, 1994: 40-41) recall the association between Vedic Dyāuḥ, bull-symbolism and thunder.

Links between deities, cows and fertility are also apparent in Irish mythology. For instance, the general importance of cattle and the specific association of bulls and fertility in Ireland is demonstrated in the *Táin Bó Cuailnge* (Cattle Raid of Cooley), which chronicles the conflict between two supernatural bulls, the Findbennach, or White-Horned of Connacht and the Donn or Brown of Cuailnge in Ulster (Green, 2002: 183). Ross (1967: 297-353) suggested that the two bulls may originally have been bull-lords, guardians and promoters of the fertility of the herd. Attested bynames connecting the Irish Sky Father the Dagda with cattle-symbolism and more generally with fertility and bringing the land to its full agricultural potential include "He who Bulls, the Son of Vigor" (Dáire mac Fiachrach) and "the Lustful Fire (of) Mighty Flowing Streams" (Aed Abaid Essa Ruaid), "the Horseman, the Son of Bulling" (Eochaid maic Dhaíre) and "the Horseman of the Yellow Brine" (Eochaid Salbudi) (Olmsted, 1994: 45; Green, 2002: 184-185; Sherwood, 2009, 202-203, 205-206). In addition to these bynames being reminiscent with a number of those associated with Mycenaean/Greek Poseidōn, the Dagda also carries a life/death-dealing trident-like club. In the *Cath Maige Tuired*, Dagda is described as wearing a "dark tunic" and carrying "behind him a forked branch with a wheel (gabol gicca rothach) which required eight men (to pull it)" and in the *Yellow Book of Lecan* version of *Táin bó Regamna*, which recounts how Dáire (the Dagda) accompanied Mórrígan (Bóand) in taking Nera's cow to be bulled by Donn Cuailgne he is described as wearing "a cropped tunic about him and forked club of hazel on his back, driving the cow before her". The *Yellow Book of Lecan* text also states that the Dagda's "great club" (lorg mor) had "a smooth end and a rough end: the one end kills the living and the other end brings to life the dead" (a similar description is also found in *Mesca Ulad*: I, 629) (Olmsted, 1994: 41, 44-47). Many of the Dagda's major exploits in *Cath Maige Tuired* are sexual in nature. This lustful characteristic and the associations with Indo-European cattle motifs are apparent in the account of the Dagda's tryst with the Mórrígan at Glen Etin, which is a variant of Dagda's union with Bóand (Olmsted, 1994: 44-47; Shaw, 2006: 164-167). It states that, "He arose then and took the girl on his back and produced three stones (which were) in his belt (pouch). He set each stone before her and said, "These are (?for?) my penis and testicles …He made bare her pubic hair to his vision. The Dagda then pierced fiercely against his mistress and made love after that. There resulted from that the great pool over the Eboile Strand which adjoined against (where they made love)…Then said the Dagda…, There will be a pool of my brine (as in the Dagda's byname "the Horseman of the Yellow Brine") apart from the girl forever …There will be a pool of my semen for every bulling hereafter. Thus it is said from this, Pool of Semen (or "Mark of the Axe"?) of the Dagda…"

6.3.3 Bóand, Nechtain and Maccan Óc: European Cognates

According to Olmsted's analysis (1994: 43-44), within Irish mythological tradition the Dagda sired the three Great Mothers (Bóand, Medb and Macha), who in turn are the mothers of all the other deities and of all existence. The genealogical relationships of the Irish pantheon as proposed by Olmsted (*ibid*.) are presented in Table 6.2. Here the focus will only be upon the figures associated directly with Newgrange and the birth Óengus Mac ind Óc story (i.e. Bóand, Nechtain and *Maccan Óc) and their European cognates, particularly their Gaulish counterparts.

Structure of Irish Pantheon		
	Dagda	
Bóand + (Dagda)	Medb + (Cú Chulainn)	Macha + (Dagda)
Cú-Rói Fand *Maccan Conchobar ?Lug?	Fraech	Fergus
Cú Chulainn		

Table 6.2: Structure of Irish pantheon (Olmsted, 1994: 43-44)

Waddell (2014: 21) highlighted the fact that the story of the origins of the Boyne is part of an Indo-European tradition, wherein river goddesses are commonly personified as cows, and the sanctity of the river is likely to be of great antiquity. The longevity of this connection is evident in Ptolemy's Geographia, complied in the 1st Century AD, which names the river as Bouvinda, another name for Bóand. Bou-vinda is thought to mean 'white cow goddess' and a similar compound occurs in Indian Sanskrit as Go-vinda (Waddell, 2014: 21-22; Sherwood, 2009: 205-206). Based on connections between bynames in corresponding tales, glosses identifying one name with another, and the variant references to genealogical relationships, it has been argued (Olmsted, 1994: 186; Shaw, 2006: 164-167, 171-172) that Bóand is referred to by a number of other names or titles in medieval literature (Table 6.3). These include reference to her as a queen (Rígan, Mórrígan), a mother (Mumain, Mór Mumain, Ana) and youthful (Mugain), as well as identifying her as a river goddess, (Danu/Danand/Dannan), a cow goddess (Eithne, Agda) and an aquatic creature or eel (Muiresc, Mata, Escung). As noted above, in the *Dindsenchas*, Bóand is also a source goddess of a powerful gushing spring (river), as is the goddess referred to by such variants as Matrona, S(t)iroa, Damona and Bormana in Gaulish inscriptions and can be identified with Bovinda "the White Cow" (see Table 6.1). Olmsted (1994: 181, 185) has outlined

Bynames of Irish Deities	
Skyfather	Dagda "God God, Capable God"; Eochaid "the Horseman"; Eochaid Feidleach "the Eternal Horseman"; Eochaid Salbudi "the Horseman of the Yellow Brine"; Eochaid Ollathair "All-Father, the Horseman"; Eochaid maic Dhaíre "the Horseman, the Son of Bulling"; Dáire mac Fiachnai (Fiachrach) "He who Bulls, the Son of Vigor"; Aedh Ruaid "Mighty Fire"; Aed Abaid Essa Ruaid "the Lustful Fire (of) Mighty Flowing Streams"; Rosa Ruaid "of Great and Mighty (Flowing Streams) (or Knowledge); Ruaid Rofhessa "the Mighty One of Great Knowledge"
Earth Mother	Bóand (Bou-vinda) 'white cow goddess'; Rígan "Queen"; Mórrígan "Great Queen"; Mumain "The (Nurse) Mother"; Mór Mumain "The Great Mother"; Ana (*Annan) "the Mother"; Mugain "the Youthful"; Eithne "the Milk Cow"; Ind Agda "Cow Goddess"; Danu (Danand/Dannan) "River Goddess"; Muiresc "Sea Fish"; Mata "Eel"; Escung "Eel"
Earth Mother's Companion	Nechtain "the Pure" (possibly *Neptionos "the Nephew" or *Nebhtunos "the Wet"); Fraech "the Heather" (the son of Medb "Intoxicatress"); Niadol "the Nephew"; Nera "the Valiant/Submerged"; Nuada "the Youthful" (variant: Nuada Argetlaim "the Youth of the Silver Hand"); Conlaech "Hound Warrior"; Belend "the Brilliant"
The Young Son	*Maccan Óc "the Young Son" Mac ind Óc or Mac in Óc "the Son of the Young One" In Mac Óc "the Young Son" Oengus "Single Conception" Ailill "the Fostered"

Table 6.3 Bynames of Irish deities (adapted from Olmsted, 1994: 45, 181-186)

correspondences between the Irish and Gaulish names and proposed that the goddess who gave her different bynames to the Seine, Saône and Marne is equivalent to the one who gave her bynames to the rivers Boyne (Bóand) and Inny (Eithne). Among these correspondences Olmsted (*ibid*.: 185) suggested that Irish Danu (Danand) "River Goddess" is semantically equivalent to Souconna "the Suckler/Flowing" and Sequana "the Flowing". It has also been noted (Shaw, 2006: 171-172; Petrosyan, 2007: 302, 304) that Danu (Danann/Danand), of which Ana/Anu may be a simple variant, derives from the same source as Vedic/Iranian Avestan Danu *Dānu- meaning 'moisture' (Indic) or 'flowing water' (Iranian). Furthermore, numerous Indo-European river-names are considered to be derived from this root including the Danube (Celtic/Germanic); Don, Donets, Dnieper, Dniester (Russia and Ukraine, borrowed from Iranian); Dunajs (Latvia); Don and Donwy

(Britain), the latter river potentially being associated with the Welsh goddess Dôn, who demonstrates various similarities to Irish Danu.

Olmsted (1994: 182-186) has argued that Nechtain, the owner of the spring from which the River Boyne erupted, is both the nephew and husband of the river goddess Bóand. Counterparts fulfilling the same role as Nechtain include such Gaulish gods as Grannos, Bormo, Albinos and Vroicos, all of whom are companions to goddesses of healing water sources. Inscriptions in eastern France pair the god Grannos with S(t)irona, Bormo with Damona/Bormana and Vroicos with Ald[a]me[…]s. In Roman Gaul these male deities were commonly equated with Apollo, e.g. Apollo Grannos and Apollo Bormo, and the Gaulish Apollo was locally associated with hot springs within which perjurers were punished (Olmsted, 1994: 181-186). Bóand's son Mac ind Óc (see Table 6.3 for variants), whose name derives from *Maccan Óc "the Young Son", is otherwise known as Óengus "Single Conception" (Olmsted, 1994: 184-186). The Gaulish equivalent is Maponos Arveriiatis "the Son (Born of) Passion of the Waters", references to whom include an inscription found at Chamalières (Auvergne) in central France and inscriptions referring to Apollino Mapono have been recorded in Britain at Hadrian's Wall and other Roman army sites. The removal of Óengus Mac ind Óc from his mother Bóand shortly after birth is paralleled in the Welsh *Culhwch ac Owein* where Mabon (Son), who is one of the Three Exalted Prisoners of Britain in *Trioedd Ynys Prydein*, was taken from his mother Modron (Mother) and imprisoned when he was only three days old (Bromwich, 1961: 433-436; Olmsted, 1994: 181, 185, 192). Welsh Modron is cognate with both Irish Bóand and Matrona, goddess of the Marne, and Mabon with Irish Mac ind Óc and Mapono/ Maponos.

6.4 Further Myths Displaying Similar Structure to Birth of Maccan Óc

In some variants of the solar myth, such as those found in Egypt (see below) the sun in conceived solely as a male deity, but as highlighted by Witzel (2005: 45-46) across Eurasia there are instances where the dawn aspect of the sun (e.g. Sūryāh, Uṣāḥ, Eōs, Aurōra, Aušrine etc.) was differentiated from, but associated with the male "sun god". In such instances the female dawn precedes the rising of the (male) sun-god each morning and at new year and appears to be frequently conceived as the night-time aspect of the sun. There are some indications that Eurasian female solar-deities were more commonly associated with the "first dawn" of spring and thus attached primarily to the economic calendar between the equinoxes and daily solar journey. However, Vedic Uṣāḥ for example was associated with both mid-winter and the beginning of spring, so there may be regional and/or chronological variances (note: see Witzel, 2005 for a series of myth variants not discussed in the current study). The Greek sun-goddess Eōs (Roman

Aurōra), who was distinct from Hẽlios the male personification of the sun, drives the sun over the sky in a chariot drawn by white horses. At sunset the sun-goddess is captured and held prisoner, but her twin brothers the Dioskouroi (sons of Zeús) come to her rescue so the sun can rise again at dawn (Kristiansen and Larsson, 2005: 297). Remnants of the Baltic version of the solar myth are preserved in the Latvian daina songs which focus on the sun-god's daughter Saũle who is captured by Velns. At night Saũle/the sun travels by ship under the earth towards its rising point in the east, recalling the night-time journey of the sun in Egyptian mythology. She dances at night on a rock in the middle of the sea, which corresponds to Vedic island in the Rasā. In addition, vestiges of the Slavic version are found in a Lithuanian tale in which Perkunas searches for Aušrine "Dawn" (one of the two Sáule "suns"), who presides at dawn and dusk, after she was abducted by Vẽlinas (Vélnias, Véls) the god of the netherworld. Perkunas is referred to as the "striker" deity, an epithet frequently associated with Vedic Índrah who opened the Vala with his vajra weapon. Further echoing the release of Indian Uṣāḥ, once freed from a cave Lithuanian Aušrine brings light, prosperity and cows into the world (Witzel, 2005: 44-45, 2012: 142-143).

6.4.1 Indian Vedic Variations on the Solar Journey

Like Irish Mac ind Óc "the Young Son" born of the "sky father" Dagda and "earth mother" Bóand, Vedic Agníḥ (Hittite Agnis) meaning "Fire" or the "Embryo of Waters", the offspring of Dyāuh and Prthivī, the "sky father" and "earth mother" (or Tváṣṭā and the Waters) was referred to as being forever young ("the Youngest" or "Young/Youth"). Agníḥ was reborn on a daily basis and travelled in a luminous, bright, golden horse-drawn lightning chariot. One of Agníḥ's forms was a female aspect Sūryaḥ "she who belongs to the sun", (re-)born each night under the ocean and raised into the heavens each morning by the gods. Váruṇaḥ appears to have played an important role in the daily solar journey, being both the captain of a night-time ship associated with the golden swing of the sun and entrusted with preparing (Sūryaḥ's messenger) Pūṣā's path across the sky during the day (Olmsted, 1994: 127-128, 232; Witzel, 2005: 46).

It has long been argued (e.g. Dumézil, 1963, 1973: 21-89; see Jendza, 2013 for counter argument) that the Vedic/Iranian Avestan deity Apām Napāt/Apąm Napāt the "Descendant of Waters" is cognate with Irish Nechtain "the Nephew". Connections between Iranian Avestan Apąm Napāt and the solar journey are suggested by descriptions of him driving with swift steeds, lying in the depths of the Waters and seizing the brightness in the depths of the oceans. Vedic Apām Napāt has similar associations along with being connected with river sources. The Waters were said to stand around the brilliant Apām Napāt who was carried by stallions and golden in appearance and colour and born of a golden womb. In some ways echoing the relationship between Irish Nechtain/Fraech and Bóand, it is stated that Apām Napāt was born in the Waters where he was nourished by three divine females, but when grown, like a bull, he impregnated them. In addition Apām Napāt, the first born of the Waters, has a milk cow which provides abundant nourishment like the otherworld cattle of Nechtain/Fraech. Apām Napāt is also referred to as Savitā "Sets in Motion", who is also described as golden in colour, or with golden/yellow hair and as driving a chariot drawn by radiant horses. Although described as "shining with sun rays" (sūryasya raśmíbhih and sūryaśmir), importantly Savitā is differentiated from Sūryaḥ in the *Rig Veda* indicating that these represent distinct and separate solar associated deities (Olmsted, 1994: 232-234).

The Vedic twin gods the dual Aśvínau apparently preserve an alternative aspect of the "twin gods" represented by the Son of Waters Agníḥ-Sūryaḥ (also the Son of Night) and the Nephew of Waters Apām Napāt. The latter pair are both born of the Waters, but only Agníḥ-Sūryaḥ is the son of Dyāuḥ, mirroring the parentage of Irish Mac ind Óc and Nechtain/Fraech. Similarly the Aśvínau, "the son of Night" and "the son of Dawn", were born of "the Ocean". Again, only "the son of Night" is described as the son of Dyāuḥ, but the Aśvínau are simultaneously twins and inseparable although born separately. Epithets refer to the Aśvínau as "Golden-pathed" (Agníḥ) and "Having a Red Path" (Apām Napāt). They are often associated with Uṣāḥ/Uṣas "Dawn" and follow her in their sun-like or golden chariot drawn by horses, swans or other birds (*ibid*.: 236).

The *Rig Veda* refers to two sisters Rātrī (Night) and Uṣāḥ (Dawn) as "the Mothers of Sūryaḥ", variants of the cosmic waters who are said to be the mothers of Agníh. Both are daughters of Dyāuḥ, just as Irish Bóand (who corresponds to Rātrī), and Medb (who corresponds to Uṣāḥ), are daughters of the Dagda. In the *Rig Veda* Uṣāḥ suckles and raises Sūryah, the son of her sister Rātrī before marrying him once he has grown, (potentially) partially paralleling the relationships between both Bóand/Nechtain and Medb/Mac ind Óc in Irish tradition. However, in the context of the daily solar journey like Agníh-Sūryaḥ, Irish Mac ind Óc is sired by the Dagda, born in a single day, abandoned by his mother Bóand and raised by his aunt Medb (*ibid*.: 234-235). The classic form of the daily solar journey myth in the Indian *Rig Veda* involves Uṣāḥ, who heralds the rising of the sun, being hidden in a cave found on an island in the middle of the stream Rasā at the end of the world. The cave is opened by the combined efforts of either Índrah and the Aṅgiras or the twin Aśvínau and the 'first dawn' emerges, illuminating the whole world. It brings with it life and riches in the form of reddish cattle identified with the reddish dawn. In Vedic tradition, in terms of the yearly solar cycle, the release of Uṣāḥ (and the birth of Agníḥ), like the birth of Irish Mac ind Óc was celebrated at the winter solstice (Kristiansen and Larsson, 2005: 297; Witzel, 2005: 4-5, 2012: 139-142).

6.4.2 Egyptian Ra, Horus and Osiris

As outlined in the preceding chapter (5.3) the mythology surrounding Nut and the birth of Ra, the earliest version of the Egyptian solar myths, encapsulates both the daily and yearly journeys of the sun. On the daily journey Ra is swallowed by Nut every evening to be reborn the following morning and on the yearly journey the conception of Ra occurred at the spring equinox and birth at the winter solstice (Van Dijk, 1995: 1706; Renggli, 2002: 2; Wells, 1992: 319-320; Maravelia, 2003: 68-72). As noted previously (5.3) during the 2nd millennium BC (beginning c. 1550 BC), the myths of Osiris, his son Horus and Ra were linked (Van Dijk, 1995: 1706) and numerous (later) sources, including Plutarch and Egyptian-language festival calendars of the late Hellenistic period, specified that a festival connected with death of Osiris took place at the time of the winter solstice (Bakry, 1955: 36-37; Kákosy, 1982: 293; Jones, 1999: 262; Hart, 2005: 80). However, the association between the death of Osiris was already associated with the winter solstice by the mid-3rd millennium BC, as recounted in the *Pyramid Texts* (2465-2150 BC) and Isis wept in lamentation for his death as crops and the Nile disappeared (Bakry, 1955: 32-33, 36-37; Kákosy, 1982: 292-293; Van Dijk, 1995: 1702-1703; Hassan, 1998: 100; Hart, 2005: 70, 80, 119-120). Beginning in the mid-2nd millennium BC, Osiris and Ra/Horus essentially became two forms of a single deity (reminiscent of the duality of Vedic solar deities Agníḥ's and Sūryaḥ), Horus being both the living "son" and the reincarnation of his dead "father" Osiris (Van Dijk, 1995: 1705). Both the death of Osiris and the birth of Horus appear to have been celebrated on the winter solstice, and thus the life-cycle featuring both death and (re-)birth was celebrated during the course of a single day in connection with both the seasonality of the Nile and the birth of the sun (Roll, 1995: 34; Jones, 1999: 262).

6.4.3 Aphrodítē and Ádōnis

According to Greek sources Ádōnis was conceived when, through the complicity of her nurse, Mýrra had an incestuous union with her father Kinýras king of Cyprus (alternatively Smýrna and her father Theias King of Assyria or Alphesiboía and Phoínix founder of the Pheonicians). When Theias or Kinýras found out that he had slept with his own daughter, he pursued her with his sword. To escape, Mýrra or Smýrna turned herself into a myrrh tree (the smýrna). Ten months later the tree burst and Ádōnis was born. While he was still an infant Aphrodítē hid Ádōnis in a chest unknown to the gods and entrusted it to Persephónē, but when asked to return him Persephónē refused to give him back to Aphrodítē. Zeús tried the case and divided the year into three parts, declaring that Ádōnis should stay by himself for one part of the year, with Persephónē for one part, and with Aphrodítē for the remainder. However, Ádōnis gave Aphrodítē his own share in addition to her own, but afterwards he was killed by a boar while hunting.

Further ancient sources indicate that Ádōnis (alongside Aphrodítē) was chiefly associated with the fertility of the land, the cultivation of grain (i.e. the economic calendar) and with the two equinotical festivals (Olmsted, 1994: 247-248). As such, it may be advanced that the tri-partite division suggested by Zeús and altered by Ádōnis indicates that two of the three four month segments fell between the beginning of spring (February) and the autumn equinox (September). Ádōnis then descended into the underworld to join Persephónē for four months following the harvesting of the grain, probably October-January, with his revival or rebirth then being celebrated at the spring equinox in March (following his mid-winter birth).

6.4.4 Romano-Greek Apóllōn (Apollo) and Phyygio-Grecian Diónysos

Apóllōn shared Delphi with Diónysos, who held the sanctuary during the three winter months when Apóllōn was absent. The Greeks held no celebrations to Apóllōn in the winter, but like Ádōnis he was particularly associated with grain, the harvest and more generally the agricultural cycle and particularly with festivals at held mid-summer and the autumn equinox. The time at which his birth was said to have occurred varied however and included mid-winter, the spring equinox and mid-summer among others. Every year Apóllōn was said to leave Delphi at the end of autumn to journey to the land of the Hyperboreans on his swan-drawn chariot. Servious recorded the legend that Apóllōn arrived to spend the six summer months in Delos after spending the six winter months in Lycia, further associating him with the equinoxes. Diónysos (who is referred to in 13th century BC Linear B text from Pylos) was a dying-reviving god associated with the vine, wine and water (including lakes, rivers and streams) and winter-solstice bull sacrifice. He was particularly associated with the bull and the serpent. Both his birth and death were celebrated at mid-winter and his revival at the spring equinox three months later, when he returned from the sea and the underworld with his mother Semélē (Olmsted, 1994, 136,-137,255, 276-283). Here we see two alternative divisions of the year both a spring-autumn division between the equinoxes and a second nine and three month division focusing around the spring equinox and mid-winter solstice. Furthermore, in the case of Diónysos his natural life-cycle was celebrated in one day, so at one level his life could be seen to have been lived over the course of a day at the winter-solstice.

6.4.5 Greek Ploútōn (Hádēs; Roman Dis Pater) and Persephónē (Roman Proserpina/Flora)

The abduction of Persephónē (Persephone/ Proserpina) by Ploútōn and her eventual return from the underworld overtly references the yearly journey of the sun. As stated above Dēmētēr's original husband was Poseidōn, but according to the Homeric Hymn to *Eis Dēmētran and Hēsíodos* Persephónē (otherwise known as Kórē "the Virgin") was the daughter of Zeús and Dēmētēr.

However, Dēmētēr is not connected with Zeús in all accounts of the story and in such instances, as in the Eleusinian version of the myth, Poseidōn is named as Persephónē's father (Voyatzis: 1998: 142). The god of the underworld (Hádēs/Ploútōn) fell in love with Persephónē and abducted her from Sicily while she was gathering flowers. Ploútōn takes her to the underworld, while Dēmētēr searches for her daughter. Dēmētēr refuses to bless the harvest, bringing on winter and infertility to the world. To save the earth, Zeús orders Ploútōn to return Persephónē, but Ploútōn gives her a pomegranate to eat before she leaves tying her to the Netherworld forever, an action witnessed by Askaláphos. Persephónē's re-appearance renews sunlight and food production, but Dēmētēr punishes Askaláphos for witnessing the consumption of the pomegranate by turning him into an owl. Additionally, because she was witnessed eating the pomegranate Persephónē is compelled to spend a third of each year with Ploúton, although the rest of the year she was permitted to dwell with Dēmētēr and the other gods on Mt. Olympus (Olmsted, 1994: 71-72; Witzel, 2005: 43; Albinus: 2014: 214-215; Warburton, 2014: 131-132).

It may be advanced that Persephónē spending one third of the year with Ploúton and the rest with her mother Dēmētēr indicates the same division of the year associated with Ádōnis, i.e. an 8-4 month division. This connection is perhaps strengthend as Ádōnis was said to descend into the underworld to join Persephónē following the harvesting of the grain. As such, it may be advanced that the portion of the year Persephónē spent with Dēmētēr fell between the beginning of spring (February) and the autumn equinox (September). Associated with Dēmētēr were the Mysteries of Agrae and Eleusis. According to Plutarchus the former took place in the spring and led up to the summer harvest and the latter took place in the early autumn. Both dealt with the cycle of rebirth and immortality, associated with both the grain and human generations, suggesting particular connections with the equinoctial cycle and the fertility and infertility of earth. This connection is perhaps strengthened as Ádōnis was said to descend into the underworld to join Persephónē and would have then spent four months in the underworld, probably October-January, followed by a return in spring. The Thesmorphória festival held in October/November was in honour of Dēmētēr and Persephónē and celebrated the mother's search for her daughter (Olmsted, 1994: 72, 75). However, the festival of Poseidōn was widely celebrated on or near the winter solstice. Similarly, the Halōa festival associated with Poseidōn, but also more overtly with Dēmētēr and Diónysos was also held at mid-winter (Robertson, 1984).

In the Irish *Aided Conrói* tale (the earliest known version of which was contained the lost manuscript *Cín Dromma Snechtai*, variously dated to the 5th, 8th and 9th-10th centuries) Bláthnat "Little Flower" (equivalent to Persephónē) daughter of king Iuchna and Mend is carried off from the Fer Falgae (equated in a glossary to the Fer Manannán, the Isle of Man) by Cú Chulainn during a night-time raid. Also taken were the "three cows of Iuchna" and "the little birds that used to be on the ears of the cows" and a cauldron which could hold the milk of thirty cows (the amount produced daily by the cows of Iuchna). Bláthnat and the other spoils were then taken by Cú Rói after he wasn't given his share after the siege of Fer Failgae. But Cú Chulainn organizes a tryst to meet Bláthnat on the first day of winter (historically Samhain/ originally mid-winter). On that day the Ulstermen kill Cú Rói, but Bláthnat is also slain during the altercation with the Cland Dedaid. Although there are obvious similarities between the two tales no mention is made of Bláthnat sharing her time between two realms in the *Aided Conrói* as Persephónē does in the Greek story (Olmsted, 1994: 55-58). It is however interesting that Bláthnat's rescue would have originally taken place at mid-winter when the sun is "reborn" at the solstice. As such, it may share connections with the Indo-European myth wherein the bright daughter of the sky-god is chased in her chariot through the daylight sky by monsters that capture her and take her into the waters at sunset (Kristiansen, 2012: 72). It may also be notable that in this story the sun-maiden is saved by her twin brothers, who are identified with the Vedic Aśvínau and the Greek Dioskouroi (Diókoroi), who are identified with Cybele and Attis, who in turn are identified with Fraech and Maccan Óc (Olmsted, 1994: 247).

6.5 Conclusion

It may be concluded that elements of Indo-European solar journey mythology are present in the Newgrange associated 'Birth of Maccan Óc' story. Within the narrative there are arguably conspicuous references to the daily and yearly journeys of the sun. Óengus, the son of the Dagda and Bóand, was conceived and born both over the course of nine months and in a single day. His birth occurred at mid-winter, indicating that he was conceived at the spring equinox and born at the winter solstice over a nine month period, and simultaneously conceived and born in a single day at the winter solstice.

The same pattern is present in the earliest version of the Egyptian solar myths, which date to the second half of the 4th millennium BC (if not earlier). The birth of Ra also encapsulates both the daily and yearly journeys of the sun and like Maccan Óc he was both conceived at the spring equinox and born at the winter solstice and over the course a single day. Echoes of the myth are also present in Vedic tradition, [elements of which have been argued to date back to the final centuries of the 4th millennium BC] where Uṣāḥ is both released from captivity on a daily basis, while in terms of the yearly solar cycle this event (and the birth of Agníḥ) occurs at the winter solstice.

Within the Romano- Greek and Phyygio-Grecian mythology connected with Apóllōn and Diónysos at Delphi there appears to be references to both the 'economic' calendar and 'religious' or 'ceremonial' calendar solar years. The earlier division between the equinoxes is connected with the departure and return of Apóllōn in autumn and spring respectively. The latter, nine and three month division, is associated with the birth, death and return of Diónysos, his birth and death being connected with the winter solstice and his return with the spring equinox. It is also notable that Diónysos' life cycle was celebrated over the course of a day at the winter solstice, further connecting the myth with both the daily and yearly solar journeys.

As noted, the connections with the 'economic' year and similar yearly divisions to those present in the Apóllōn myth are also evident in other Greek myths. The myth connected with Ádōnis suggests primary connections with the 'economic' calendar within a tri-partite division of the year, with Ádōnis descending into the underworld during the winter months after the autumn equinox and returning around the spring equinox. The myth connected with Persephónē shows the same connections with the 'economic' calendar as the Ádōnis myth. Persephónē, whom Ádōnis was said to join during the winter months, also spent the third of each year between the autumn and spring equinoxes in the underworld. It is also notable that within this milieu the 'religious' or 'ceremonial' calendar and the winter solstice was connected with the festival of Poseidōn and/or the Halōa festival associated with Poseidōn, Dēmētēr and Diónysos, perhaps giving further support to the existence of two concurrent solar years.

7 Newgrange & Brú na Bóinne Contextualized: Cosmology, Geography and Ritual

7.1 Introduction

Following on from the evaluation in the previous chapter of whether elements of Indo-European solar journey mythology are present in the Newgrange associated 'Birth of Maccan Óc' story this chapter will seek to investigate how cosmological and mythological concepts connected with the 'journey of the sun' and the three-tiered cosmos may have informed spatial, architectural and iconographic representation in the structure and siting of monuments in Brú na Bóinne. An overview of how these concepts may have been integrated with growing complexity into the structures of the Irish passage tomb tradition will seek to inform how these conceptions may have been integrated into the utilization of the Boyne Valley as a liminal landscape and both the architecture, alignments and iconography of the complex monuments at Newgrange 1, Knowth 1 and Dowth. The significance of these monuments from a communal perspective will be considered in terms of their initial construction and subsequent use during large-scale gatherings, with particular reference to the winter solstice period. In addition, as a contribution to further understanding possible interaction with these structures by individuals, an investigation of whether 'after-death communications' could have been facilitated by passage tombs will be undertaken.

7.2 Liminal Locations, Axis Mundi and the siting of Irish Passage Tombs

7.2.1 Heights

In various cultures and locations around the world, sacred mountains (or elevations), which range from the highest mountains to hills which barely rise above the surrounding landscape, are regarded as natural objects of religious devotion. Notable examples include Sinai and Zion in the Middle East, Olympus in Greece, Kailas in Tibet, T'ai Shan in China, Fuji in Japan, Uluru (Eyer's Rock) in Australia (although not a mountain), and the San Francisco Peaks and Shasta in the USA. Traditionally mountains have been revered variously as symbols or places that embody, generate or endow particular characteristics or qualities (Table 7.1) (Bernbaum, 1997: xxiii, 1998: i, 2006: 304-305; Coyne, 2006: 11).

Symbolic Characteristics or Qualities of Mountains
sacred power
psychic and spiritual experience
prophesy
oracular powers
divine intervention
revelation
spiritual attainment
energy
centre of the universe
sources of life
thresholds between the underworld, earth and sky
pathways to heaven
abodes of the dead
temples of the gods

Table 7.1: Symbolic characteristics or qualities of mountains (adapted from (Bernbaum, 1997, 1998, 2006; Coyne, 2006)

Heights can be connected with ceremonial practices through the construction and subsequent presence of 'sacred' man-made structures such as burial monuments, temples, monasteries, hermitages etc. and/or the activities of important holy persons (Bernbaum, 2006: 305). Many societies place monuments on elevations to emphasize the sense of liminality or otherness of the structures and the specialness of the rites associated with them (Barnett, 1998: 96). However, while these activities reinforce the importance of natural landscape features and augment or intensify their 'sacredness', they do not create their sacred or liminal character. The liminal character of visually prominent landscape features derives from a combination of physical, organic and culturally defined characteristics and adscititious (i.e. non-inherent) meanings. The root of this culturally defined liminality or sacredness undoubtedly lies in natural properties, particularly physical height and associated weather systems. Landmarks may be regarded as strategic foci which are given salience to allow them to be differentiated from their surroundings. Prominent natural features are usually part of the common geographic knowledge structure of population groups, as they can be perceived and recognized from a distance. These "reference nodes" or "landmarks" act as anchor points and location identifiers for organizing other features and as constant, communicable referents to which regional (or wider) group identities can be linked (Golledge, 2003: 36-37; Bernbaum, 1997: 208, 2006: 305). Elevated areas, particularly mountains, often have unique weather systems which produce localised phenomena resulting in their disappearance, re-appearance and alterations in appearance (Cummings and Whittle, 2004: 84-86; Coyne, 2006: 12-13). Heights also provide a unique perspective of both the landscape and cloud cover, and their ascent can be accompanied by noticeable temperature differences. Another unique visual phenomenon that occurs at high elevations is the 'broken-spectre' which occurs when the sun projects the shadow of the observer, which may be surrounded by a rainbow-like halo, onto low-lying cloud (Cummings and Whittle, 2004: 85; Coyne, 2006: 12).

These properties have resulted in elevations being singled out as (a) places of sanctity; (b) features upon which natural 'shrines' are situated (e.g. stones, springs or groves); and (c) locations appropriate for burial and/or the construction of 'sacred' structures. Once conferred with a liminal character and in some cases 'sacred' status prominent landscape feature will have developed networks of myths, beliefs, and a range of ceremonial practices such as pilgrimage, meditation, and sacrifice (Bernbaum, 1997: 211, 2006: 304-305). Although there are cultural variations, mountains or hills are commonly regarded as central locations within local regions and can even symbolize the centre of the world or cosmos and frequently they are viewed as manifestations of paradise, the otherworld or the heavens on earth. Due to their relative physical closeness to the 'otherworld' and as locations where water, earth, sky and stone meet they may become regarded as axis-mundi. Thus, prominent landscape features are revered as natural places or temples of worship and locations of natural and supernatural power in many traditions. The power of many 'sacred' landscape features derives from the perceived presence of deities – in, on, or as the mountain itself. Furthermore, as river sources are frequently located on hills and mountains, they are often considered to be symbolic sources of life, fertility, and healing. These associations and their physical prominence can imbue their ascent with cultural significance and thus reaching a summit may symbolize the attainment of a spiritual goal. Consequently, they may also be seen as ideal places for meditation and obtaining spiritual inspiration, renewal or transformation (Layton, 1999: 26; Gazin-Schwartz and Holtorf, 1999: 16; Cooney, 2000: 89; Cummings and Whittle, 2004: 86; Bernbaum, 1997: 211-212, 2006: 305-306).

7.2.2 Watery Locations

The liminal character of water or watery locations including bogs, rivers and lakes may be suggested to derive from water's multifarious nature and associations with the duality of being able to give and take life. As such they may perhaps be regarded as 'gateways to a spirit world' (Parker Pearson 1999, 70). Water can represent life and death simultaneously and as such watery locations may be regarded as embracing a space between shifting and alternative states and locations of being (Eliade, 1958: 388-389; Barth, 1987: 32-34; Kamash, 2008: 224-225). Drawing upon this idea bogs, lakes and rivers may be viewed as portals between and linking the world of the living with that of the dead or 'otherworld' as the reflectivity of water, particularly when still takes on the colour of the sky and reflects the heavenly bodies (Davies and Robb, 2004, 8; Kamash, 2008, 230-231). Reflective surfaces (including mirrors, water, and polished surfaces) are considered to be 'liminal films' between, or openings to, alternative realities or alternative plains of being in various mythologies, folkloric and religious traditions, where these axis-mundi are used for contacting spirits, divination, and entering altered states of consciousness (Lang, 1910; MacDonald, et al., 1989; Smith, 2002; Giles and Joy, 2007: 26; Tart, 2008; Hastings, 2012: 19).

7.2.3 Tri-partite Division of the Cosmos

The ancient Egyptian (Renggli, 2002; Kramer, 2010; Haggag, 2013) and Indo-European myths about the daily journey of the sun (Kristiansen and Larsson, 2005: 297, 306-308; Kristiansen, 2012: 72; Witzel, 2012: 139-143) indicate the existence of widespread mythological beliefs in a conceptual cosmologically founded tri-partite division of the world or universe. In this context as Northern Europe has both substantial evidence for cemeteries and rock-art (with apparently cosmological connotations) dating from the Mesolithic through to the Iron Age and various extant populations maintaining traditional belief systems, this region may provide further insight into the longevity of this tri-partite concept. The cosmology of the populations in the European and Siberian arctic recognizes a vertical division of the cosmos into three basic worlds, the upper situated in the sky, the middle located on land and the lower underworld beneath the water and ground. These three levels of the cosmos are conceived to be connected by a vertical axis mundi and the upper and lower worlds which are the abode of deities and spirits are abstract reflections of the middle world inhabited by humans and animals. Among the nomadic peoples of northern Eurasia, the lower world is commonly accessed through water with particular rivers and lakes considered to lead to the underworld (Helskog, 1999: 76-78; Lahelma, 2005: 40; Bradley and Nimura, 2013: 16; Anttonen, 2014: 377-379).

7.2.4 Passage Tomb Sub-Types and their locations in the Irish Landscape

Hensey (2010: 265-293) has provided an innovative sub-division of passage tombs which provides an informative overview about the differing roles and landscape siting of a series of monuments perhaps intended for a range, and in some ways differing purposes. It is also clear that within this milieu that although the liminal qualities of water and heights were utilized in varying ways to reinforce those of the monumental constructions, the physical attributes of the landscape also served to facilitate the monuments differing functions.

The simple passage tombs of Ireland (Hensey Group A) believed to date to the early stages of the 4th millennium BC, are considered to represent some of the earliest megaliths on the island. The majority are distributed in the north-west and north-east with possible examples in the east and south-west, are found in predominantly coastal locations and where not overlooking the coast itself are situated close to estuarine rivers (Hensey, 2010: 265-272). These monuments have tended to be interpreted as representing a change in the relationship between communities and the land, of control over nature (e.g. see Bradley, 1998: 33-35, 51-54). In addition, it is frequently asserted that these structures were designed and built primarily to contain human bone and indicate a belief system that was focused on "ancestral ritual" or "ancestral worship" (e.g. Sheridan, 1985/86; Bradley, 1998: 54-87; Cooney, 2000: 119, 121, 124-126; Hensey, 2010: 271). However, it may be advanced that these monuments, in their coastal and riverine locations, were constructed by groups who wished to express a belief system grounded in a three-tiered cosmology. In a similar way to what has been advanced in the case of Northern European petroglyphs (e.g. Helksog, 1999: 81-82, 92; Bolin, 2000: 158, 160, 171; Ling, 2004, 2008; Lahelma, 2005: 37-40; Bradley, 2006: 378-380; Bradley and Nimura, 2013: 20-21), their siting may indicate a desire to engage in ceremonial activity in locations where the heavens, earth and "underworld" converged. Their probable proximity to contemporary habitation, 'open' morphology and lack of covering mounds or cairns (Hensey, 2010: 289), suggests that these were communally focused monuments associated with 'visible' ceremonial activities (Bergh, 1997: 146-149). Although not accessible in the same way as developed passage tombs, evidence indicates that materials could be deposited in (or removed from), the chambers or entrance areas (e.g. Burenhult, 1984: 64; Sheridan, 1985/86: 27). As such, is it appropriate to say they were primarily for burial? Perhaps it would be more appropriate to say that these were primarily ceremonial monuments. It may also be proposed that instead of referring to them as tombs, these structures should be classified as "shrine alters" where small offerings could be made to the deities of the three tiers. It may also be argued that if these monuments functioned as such, the individuals interred within them may have served an intermediary function, facilitating communication with the "otherworld" and thus interpreting these monuments as epression of "elite authority", "genealogical affirmation" or "territorial markers" (e.g. Fleming, 1973; Renfrew, 1973, 1978; Chapman, 1981, 1995; Sheridan, 1986/87; Bradley, 1998: 54-62; see also Bergh, 1995: 141-156) needs comprehensive re-evaluation. However, a thorough reconsideration of these monuments is outside the confines of the current study.

The vast majority of Irish passage tombs are included in Hensey's Group B (2010: 273-278) designation and most were probably constructed between c. 3500 BC and the earlier centuries of the 3rd millennium BC. These are cairn-covered structures and include the earliest specimens to feature 'megalithic art' and astronomical alignments (although where the latter are present, they tend to be 'imprecise'). Hensey (*ibid*. 254-262, 273) has argued that architectural elements such as recesses, shelves and door-stones could indicate that they were utilized for prolonged "rites of seclusion". These monuments are typically located in isolated landscape situations (i.e. elevated land/hilltops, river boundaries) and the majority of monuments in the larger passage tomb complexes have been included in this group (*ibid*.: 274).

Hensey's (*ibid*.: 279-284, 295-298) Group C monuments (Table 7.2), most "dedicated" examples probably having been constructed c. 3300-3000 BC, are the most architecturally complex and typically their siting was informed by the location of pre-existing complexes. In addition to features common to Group B monuments, further architectural embellishments associated with Group C include stone basins, abundant kerbstone art, straightened façades, platforms, standing stones, multiple stone settings, the external deployment of quartz, and in some instances structures possibly related to procession.

Hensey Group C Designations		
Dedicated Group C	Probable Group C	Group B adapted to Group C
Knockroe (Kilkenny) Dowth (Meath) Knowth 1, (Meath) Newgrange 1 (Meath) Baltinglass (Wicklow)	'Carn Dáithí' near Cong (Mayo) Cairns Hill East (Sligo) Cairns Hill West (Sligo) Heapstown (Sligo) 'Miosgán Meadhba' Knocknarea (Sligo) Donaghanie (Tyrone)	Cairn D, Loughcrew (Meath) Cairn L, Loughcrew (Meath) Cairn F, Loughcrew (Meath) Cairn H, Loughcrew (Meath) Cairn T, Loughcrew (Meath) Cairn W, Loughcrew (Meath) Cairn F, Carrowkeel-Keshcorran (Sligo)

Table 7.2: Hensey Group C designations

The Group B monuments are often in difficult to access high altitude locations, but others are at moderate height or at lower elevations surrounded by rivers. The Group C tombs appear to have been situated to facilitate with communal access, but nevertheless are usually in visually prominent moderately elevated positions and/or surrounded by watercourses (*ibid*.: 289-290). Again, it may be argued that these monuments, being situated on heights and or close to rivers suggests the presence of a three tiered cosmology and siting in locations where the heavens, earth and "underworld" converged.

7.3 THE RELATIONSHIP BETWEEN PASSAGE TOMBS AND THE RIVER ON THE BOYNE 'ISLAND'

Various commentators (e.g. Mitchell, 1997; Cooney, 2000: 153; Lewis-Williams and Pearce, 2005: 198, 201; Cochrane, 2006: 124-125, 2008: 165-166) have drawn attention to the 'island-like' qualities of the Boyne Valley and this 'bounded isolation' may have contributed to its designation as a 'place apart' (Hensey, 2010: 274-275, 282-293). These and other studies have tended not, however, to focus explicitly on the potential importance of the river itself to the builders of the passage tombs (*ibid*.: 239). For instance, Stout and Stout (2008: 16) noted that almost the whole course of the river is visible from Newgrange, but little consideration was afforded to determining any deeper relationship. However, Hensey (2010: 233-251) has ventured a potential symbolic relationship between the Boyne tombs and the nearby watercourse, by placing particular emphasis and significance on associations with migratory salmon (5.9.1).

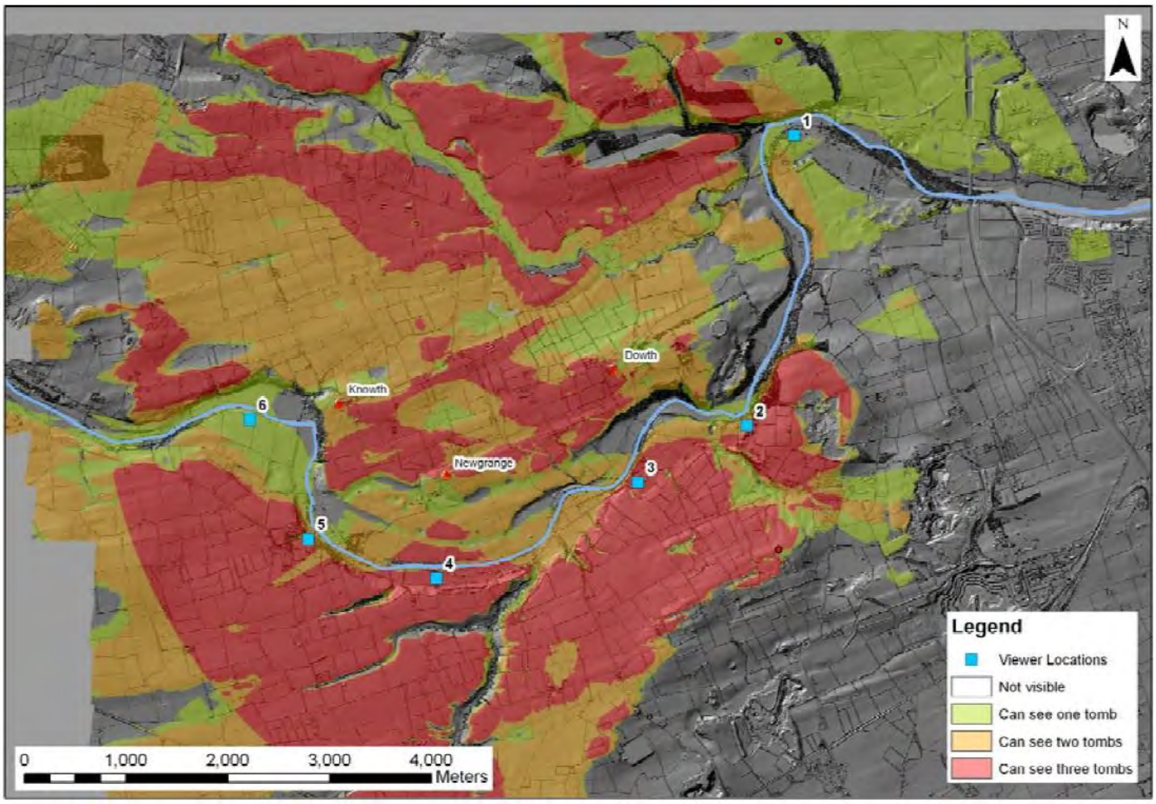


Figure 7.1 Viewshed analysis showing key points along the River Boyne from which the passage tombs are visible (Davis, et al., 2010b: Fig. 31.)

Recent GIS analysis (Davis, et al. 2010a, 2010b) has further elucidated the visual relationship between the large passage tombs, the river, and the landscape in which they are situated (Figure 7.1). In general terms it appears that concern with the visual impact of the tombs from elsewhere in the landscape, primarily areas to the south, superseded the importance of the field of vision from the monuments. The visual relationship between the river and the monuments appears to involve various 'choreographed' oppositions of invisibility, appearance, visibility and disappearance. For instance, views of the river are available from the base of the monuments, but are restricted from the tomb entrances (Davis, et al., 2010a: 13, 2010b: 59-65, 79). In broad terms, travelling downstream and alternating between locations where the monuments become invisible, Knowth is the first to come into view, then Knowth is joined by Newgrange, then all three monuments become visible for a 1km stretch, then Newgrange and Dowth are visible, and finally Dowth alone before it too disappears, before re-appearing around the Mattock/Boyne confluence (Davis, et al. 2010a: 14, 2010b: 52-55, 66-68). It is also notable that Knowth disappears when the river changes course between Newgrange and Dowth and the latter is actually situated on a separate 'meander' (or bend) of the east-west section of the Boyne 'loop'. This subtle geographic 'seclusion' of Dowth appears to be confirmed by a combination LiDAR imagery, the topography of the floodplain, and location of palaeo-channels (Lewis, et al., 2008, 2009) which indicate that the course of the river cannot have changed significantly. It may be advanced that this pattern of visibility and invisibility suggests a subtle symbolic east-west sub-division of Brú na Bóinne (see also: Boyne Valley7.11.1.1) wherein Newgrange acts as a lynchpin or even potentially the primary focus of the complex. It may be suggested that an eastern pairing exists between Newgrange and Knowth along one meander and a western association between Newgrange and Dowth on its separate section of the river.

7.4 Physical Representation of a Three-tier Cosmology

Bradley (1989) and Thomas (1990) were the first to argue that there is a connection between the structure of passage tombs and not only human consciousness, but by extension the expression of cosmological and associated religious beliefs. Expanding upon this assertion Lewis-Williams, Dowson and Pearce (Lewis-Williams and Dowson 1993; Lewis-Williams and Pearce 2005) went on to argue that these structures, which facilitate movement into the 'underworld' on the one hand and on the other connect to the heavens through solar alignments by means of their passages, symbolically connect the realms of a three-tiered cosmos. Furthermore, in this context, the structures themselves may be an iconographic material representation of this cosmological principle (Lewis-Williams and Pearce, 2005: 65-66, 243-246, 279). Robin, (2009: 217-253, 328; 2010: 373-385, 411-413) has identified three further spatial principles employed symbolically in the architectural structuring of passage tombs. These are (1) a system of concentric spaces, (2) a central axis as a line of penetration, and (3) a central axis as a line of opposition (note: hereafter, lateral opposition).

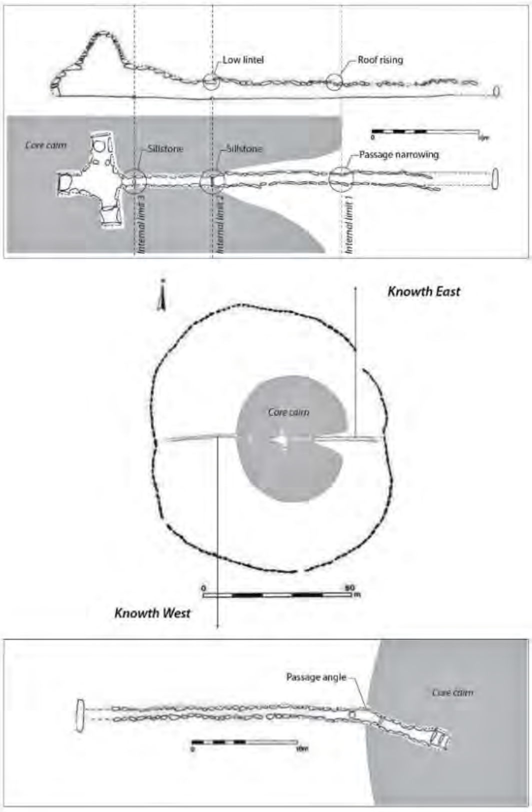
Robin (2009: 217-253, 327, 2010: 373-375, 383-385, 394, 397-405, 2012: 147) has demonstrated that his three main spatial structures, and by extension the connected symbolic system, is represented and reproduced in the architecture and/or art of numerous monuments in Ireland and Britain (Table 7.3). As such, it is apparent that this cosmological scheme was found throughout the region and was an accepted template which contained a suite of conventions from which to choose, facilitating the physical representation and reproduction of these ideas.

As a system of concentric spaces (Robin, 2010: 373-375, 411-412), the circular tumulus is composed of several concentric layers (turves, stones, sand, etc.) which are delimited by a series of circular structures (kerb, low facings, ditches, stone rows, etc.). This structure occurs to varying degrees within several Irish passage tombs (Table 7.4). The passage physically and symbolically connects the outside world to the chamber and the centre of the mound and along this axis are a series of architecturally and/or graphically signalled thresholds which spatially correspond to the successive layers or spheres inside the tumulus (Figure 7.2; Robin, 2010: Table 1.)

	SPATIAL STRUCTURES										
	TUMULUS = Concentric spaces		MEGALITHIC TOMB = series of thresholds				AXIAL OPPOSITIONS				
SITES	Materialization of concentric spaces	Delimitation of concentric spaces	Physical thresholds in relation to tumulus partition	Threshold-signs in relation to tomb partition	Threshold-signs in relation to symbolic doorways	Motifs in exclusive relation to recesses	Graphical representation of the axis	Architectural emphasis on the right side	Opposition of tumulus material or deposits	Opposition of carved motifs	Opposition of furniture
Ashleypark		■									
Ballycarty		■									
Baltinglass									■		
Banagher		■									
Baunfree		■									
Barclodiad y Gawres	■			■				■			
Bryn Celli Ddu		■						■			
Carnanmore							■				
Carrowmore 1		■									
Carrowmore 4		■	■								
Carrowmore 7		■							■		
Carrowmore 27		■									
Carrowmore 37		■									
Dowth North				■	■			■			
Dowth South				■	■			■			
Fourknocks				■							
Grange North		■									
Knocklea	■										
Knockmany	■			■							
Knocknarea 1		■									
Knockroe West							■	■			
Knowth 1 East	■		■	■		■	■	■		■	■
Knowth 1 West	■		■	■	■		■	■		■	
Knowth 2	■							■			■
Knowth 4	■	■	■	■							
Knowth 12	■	■									
Knowth 13									■	■	
Knowth 14					■	■					
Knowth 15	■	■	■								
Knowth 16	■	■	■								
Knowth 17				■				■			
Knowth 18		■									
Loughcrew F				■			■				■
Loughcrew H				■				■			■
Loughcrew I				■	■	■		■			
Loughcrew L				■	■	■		■		■	
Loughcrew S				■							
Loughcrew T				■	■	■					
Loughcrew U				■	■	■					
Newgrange 1	■	■	■	■		■	■	■		■	■
Newgrange K		■	■					■			
Newgrange L	■	■									■
Newgrange Z	■	■	■					■			
Tara	■										■
Townleyhall	■	■						■			

Table 7.3: Summary of the three main spatial structures as represented in the architecture and/or art of passage tombs (Robin, 2010: Table 4.); missing from Robin list: Carrowmore 51, "Listoghil" which features concentric spaces (see Bergh, 1995: 198)

Sites	Spatial differentiation of tumulus materials	Internal enclosures	External enclosures
Ballycarty		1 stone enclosure	1 kerb
Banagher		1 stone enclosure	1 kerb; 1 stone circle
Barclodiad y Gawres	turves; stones		
Baunfree		1 stone enclosure	1 kerb
Bryn Celli Ddu		1 stone enclosure; 1 stone circle	1 kerb; 1 stone circle
Carrowmore 1		1 stone enclosure	1 kerb
Carrowmore 4		3 stone enclosures	1 kerb
Carrowmore 7		1 stone enclosure	1 kerb
Carrowmore 27		1 stone enclosure	1 kerb
Carrowmore 37		1 stone enclosure	1 kerb
Grange North		1 stone enclosure	1 kerb
Knocklea	shells; turves		1 kerb
Knockmany	stones; turves		1 kerb
Knocknarea 1			1 kerb; 1 bank
Knowth 1	stones; turves		1 kerb
Knowth 2	compact earth; turves		1 kerb
Knowth 4		3 stone enclosures	1 kerb
Knowth 12	stones; turves	1 stone enclosure	1 kerb
Knowth 15	turves; boulder clay	2 stone enclosures	1 kerb
Knowth 16	stones; turves	4 stone enclosures	1 kerb
Knowth 18		1 stone enclosure	1 kerb
Newgrange	stones; turves	3 stone enclosures	1 kerb; 1 stelae enclosure
Newgrange K		3 stone enclosures; 1 ditch	1 kerb
Newgrange L	sand; turves	1 stone enclosure	1 kerb
Newgrange Z	turves; boulder clay	1 stone enclosure	1 kerb
Tara	turves; stones		
Townleyhall	stones; sand	4 stone enclosures	1 kerb



(Left) Table 7.4: Summary of the materials and structures that compose the tumulus system of concentric spaces (Robin, 2010: Table 1.); missing from Robin list: Carrowmore 51, "Listoghil" which features a boulder kerbsurrounded by a low platform (see Bergh, 1995: 198)

(Right) Figure 7.2: Tumulus of Knowth 1 showing the spatial relationships between the structure of the core cairn and the internal partitions of the eastern and western tombs (Robin, 2010: Fig. 8.)

The central axis that crosses the tumulus as a line of direction/penetration is manifested in the linear megalithic structure (passage and chamber) and the location of specific carvings (e.g. arc alignments, central lines). This axis starts from the middle of the entrance kerbstone, runs through the backstone of the chamber and continues across the tumulus as far as the opposite kerbstone (Robin, 2009, 231-238, 327, 2010: 397, 412). The passage tomb axis is also emphasized by the form, the location and the orientation of particular motifs. For example, the kerbstones

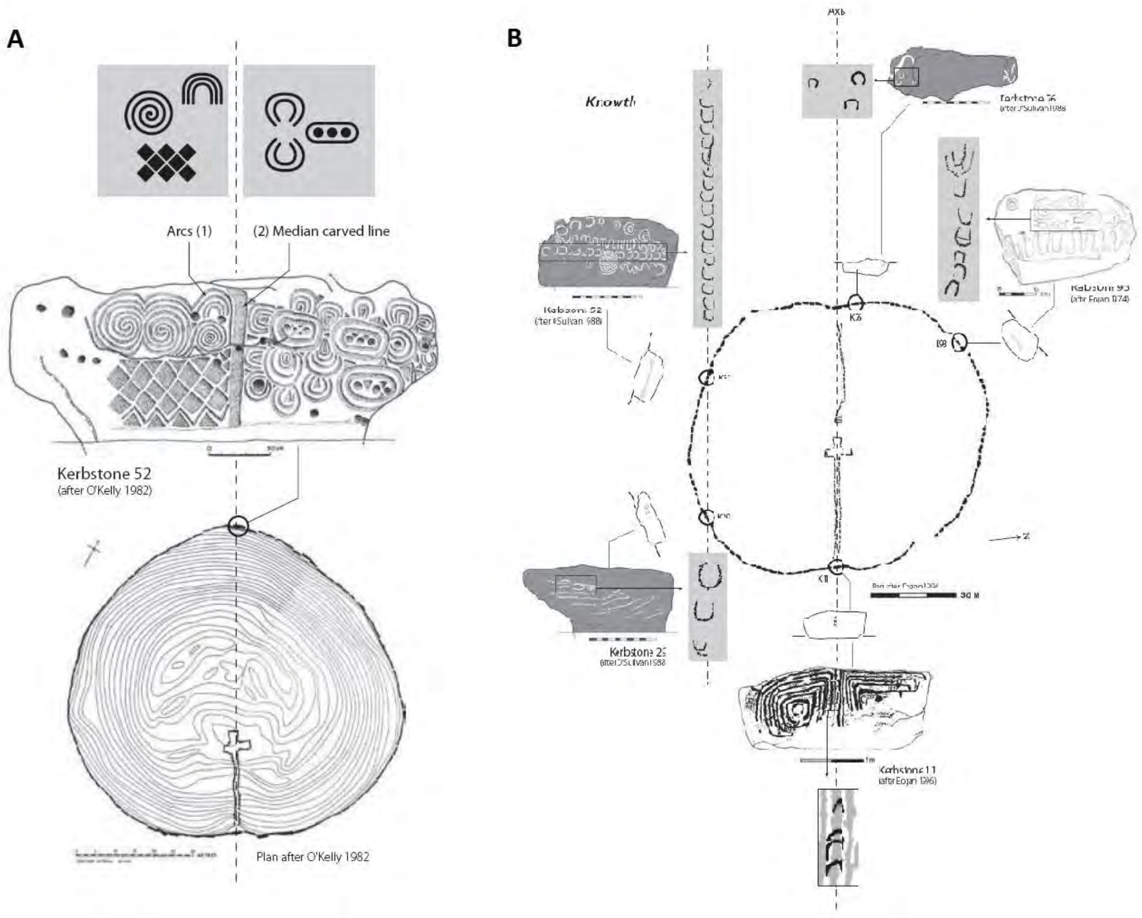


Figure 7.3: Lateral opposition in distribution of groups of carved symbols and correspondence between tomb axis and alignments of simple arcs. (A) Newgrange showing the opposition of groups of carved symbols (Robin, 2010: Fig. 22.); (B) Knowth showing the correspondence between the tomb axis and the orientation of the carved alignments of simple arcs (Robin, 2010: Fig. 20.)

that mark the entrances of both Newgrange 1 (Figure 7.3) and Knowth 1 (Figure 7.4) are carved with a vertical central line. Eogan (1978, 1986, 1996) argued that the function of this motif is to indicate the entrance of the tombs, but Robin (2010: 397) suggests that it represents the axis of the monument. Also of interest are the five kerbstones at Knowth 1 wich are decorated with alignments of single arcs (Figure 7.3). The orientation of the motif varies (vertical or horizontal), but systematically coincides with the axis that the two opposite tombs create inside the large tumulus (Robin, 2009: 170-173, 327, 2010: 397-401, 412, 2012: 147). Robin (2012: 147-150) interprets these as schematic representations of the megalithic passages "in perspective".

Further widespread conventions are evident in the spatial organization of passage tomb art and it may be argued that this confirms the presence of a common symbolic system. For some time, a widely recognized pattern has been the deployment of different symbols in different parts of tombs with a gradual increase in the density of motifs, with more complex combinations and

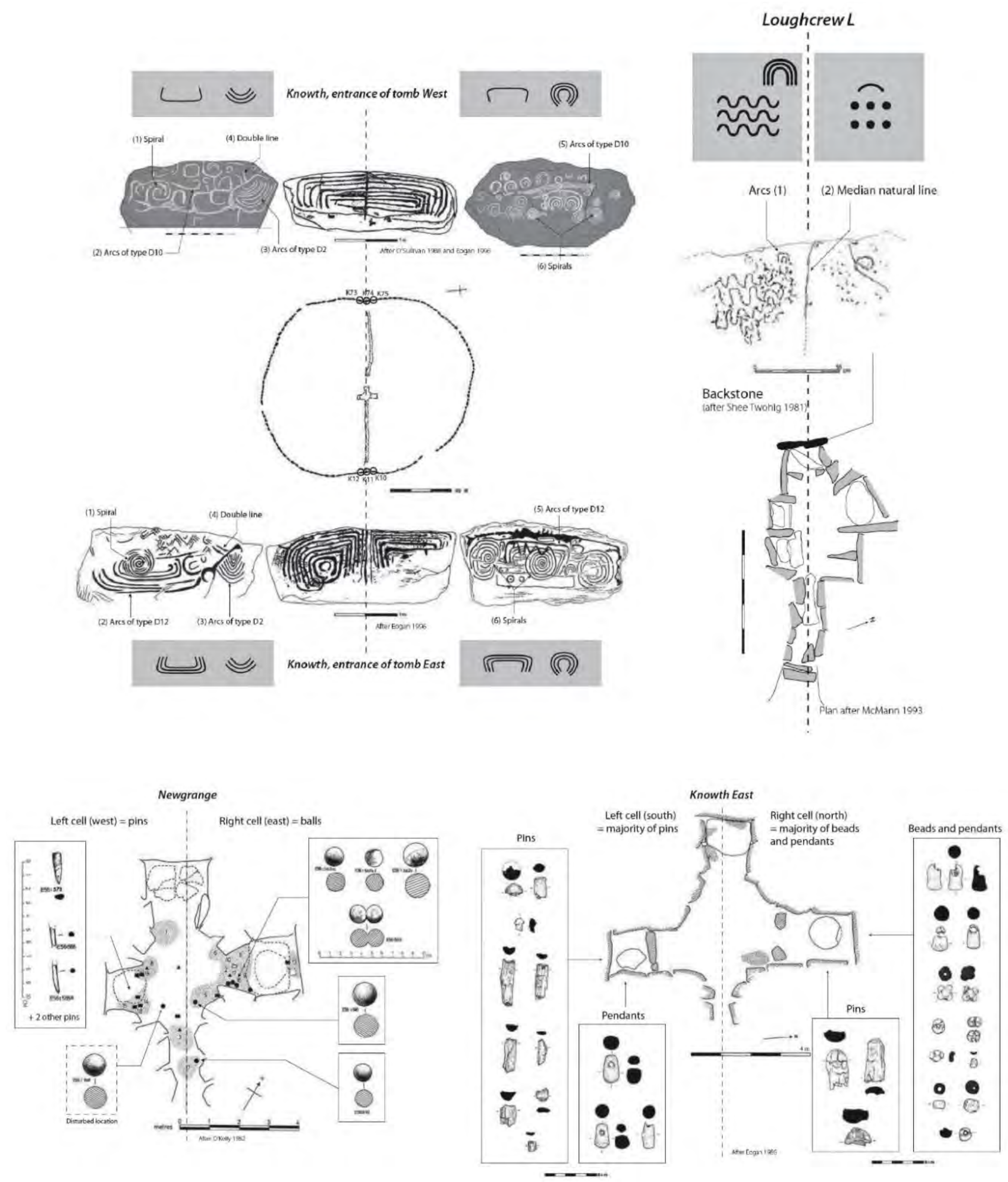


Figure 7.4: Lateral opposition in the distribution of carved arcs and funerary furniture. Top Left: Knowth 1 showing the opposition of the orientation of the carved arcs at the entrance of western and eastern tombs (Robin, 2010: Fig. 24); Top Right: Loughcrew L showing the opposition of groups of carved symbols (Robin, 2010: Fig. 22.); Bottom: Newgrange and Knowth East showing the lateral opposition of funerary furniture (Robin, 2010: Fig. 25.)

compositions, occurring towards the chamber areas (e.g. Thomas, 1993: 87-88; Robin, 2009: 231 326).

Robin (2010: 397, 412) argues that lateral opposition is a distinctive feature of passage tombs, but also notes (*ibid*.: 400) that a principle of symmetry and balance seems to be respected in the overall composition of the monuments. Notwithstanding, he has demonstrated that this lateral

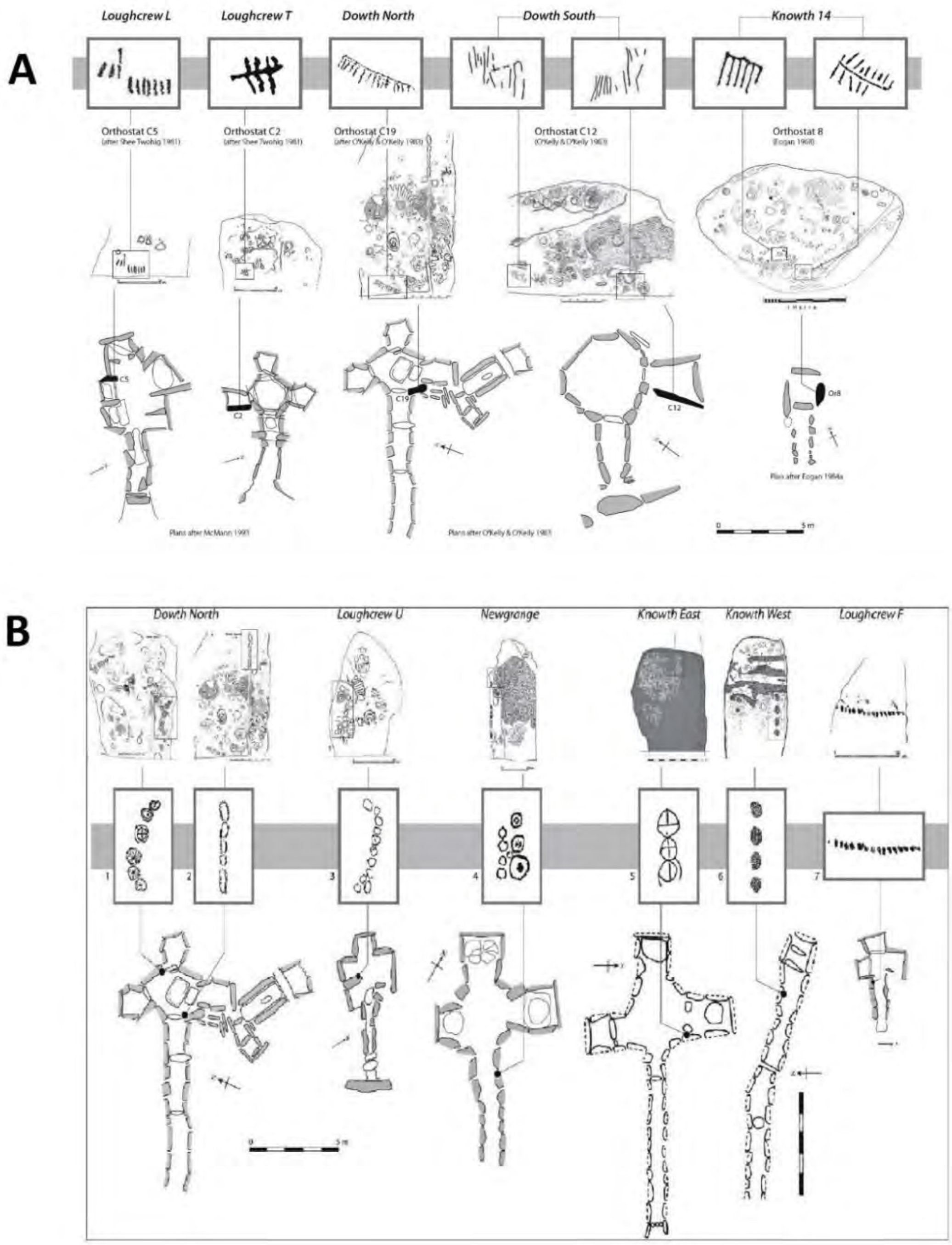


Figure 7.5: Distribution of scalariform/ramiform motifs and linear arrangements of circles. (A) Location and layout of the scalariform/ramiform motifs in the recesses at Loughcrew, Dowth and Knowth (Robin, 2010: Fig. 16); (B) Linear arrangements of circles and their relationships with architectural thresholds. 1-2: Dowth North, orthostats C7 and C19; 3: Loughcrew U, orthostat C2; 4: Newgrange, orthostat R20; 5: Knowth East, orthostat 56; 6: Knowth West, orthostat 39; 7: Loughcrew F, orthostat L4 (Robin, 2012: Fig. 10.6.)

opposition is portrayed in the spatial organization of architectural elements, carved motifs (Figure 7.3, Figure 7.4) and funerary deposits (Figure 7.4) (Robin, 2009: 162, 2010: 397, 400, 403, 405, 407, 412) and frequently the right-hand side is emphasised, a characteristic that is often highlighted as a feature of the megalithic architecture (e.g. Shee Twohig, 1996: 79; O'Sullivan,

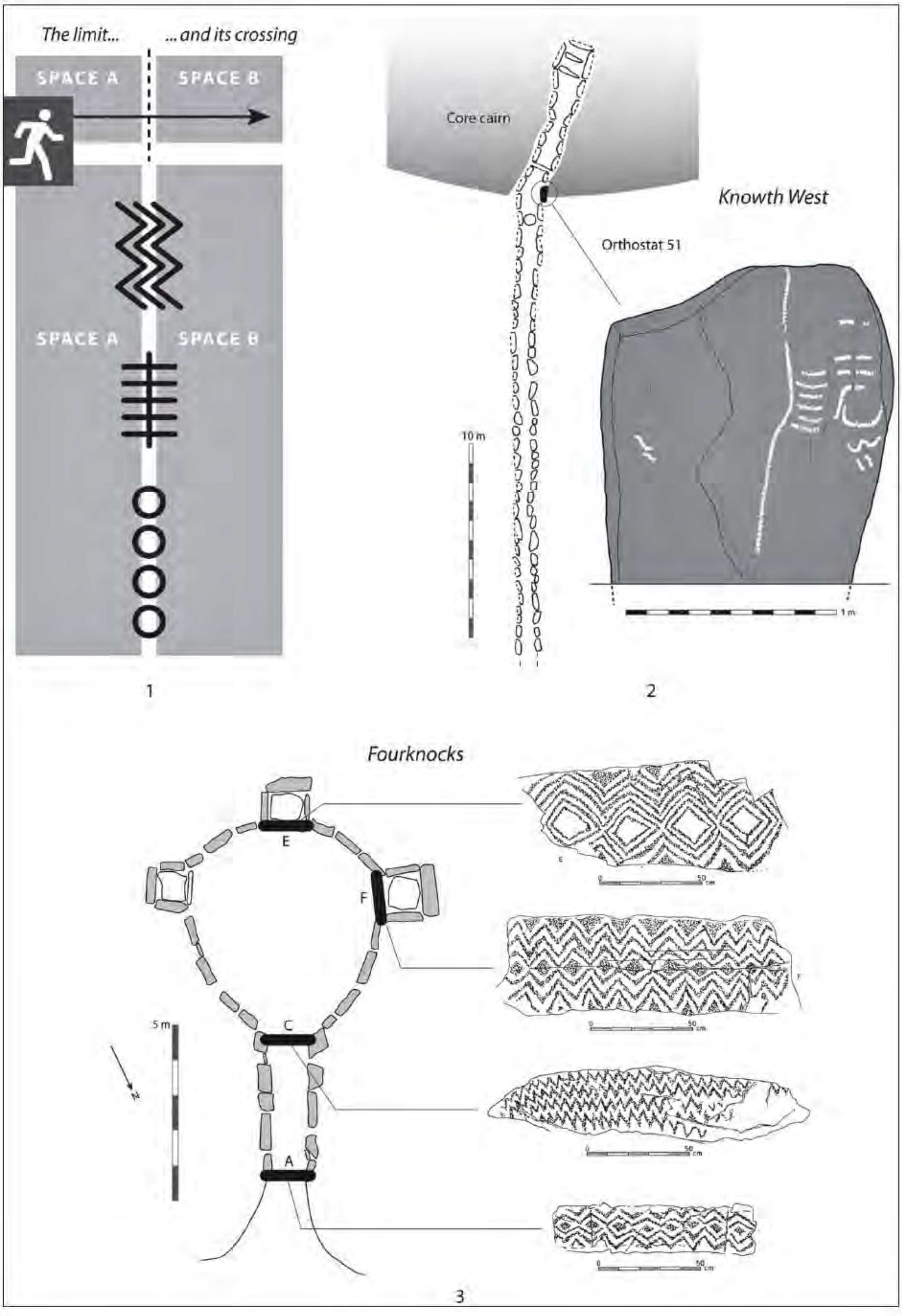


Figure 7.6: The figuration of thresholds and their crossing. 1: Structural analysis of the three 'threshold-signs'; 2: the scalariform motif on orthostat 51, Knowth West, and its relationship with the major architectural threshold inside the tomb; 3: Fourknocks, the lintels decorated with chevrons and their relationship with four major thresholds inside the tomb (Robin, 2012: Fig. 10.7.)

1997: 26; Bradley, et al., 2000: 60). However, although lateral opposition is identifiable in the distribution of funerary objects in numerous monuments it does not constitute an absolute rule in the British Isles (Robin, 2010: 407).

In addition Robin's (2009: 217-238, 325-327, 329) analysis of the spatial organization of the motifs has demonstrated the existence of an even more elaborate set of symbolic "grammatical rules". These "rules" were employed across Ireland and in Britain and they dictated the deployment of particular symbols in predetermined, recurring architectural locations. Certain motifs (meandering lines, spirals, arcs, circles) are carved mostly in the "outer" parts of the tombs (kerb and passage), while other motifs (radiate circular signs, scalariform/ramiform symbols) are more typically located in the deeper spaces of the architecture (chamber and recesses). His systematic analysis has shown that a number of more nuanced recurring patterns are also identifiable throughout Ireland and in Britain (Robin, 2009: 181-197, 327, 2010: 385-395). Specifically, the internal partitions or liminal spaces of passage tombs, the passage (outer passage, inner passage or ante-chamber) and chamber (inner compartments and recesses), may be emphasized architecturally by both specific structures (othostats, sillstones, lintels, jambstones, etc.) and by graphical means ('threshold-signs').

Recurring 'threshold-signs' (Robin: 2009: 128-150) identified include (a) parallel chevrons or zigzags (Figure 7.6, Figure 7.22), (b) scalariforms/ramiforms (Figure 7.5) and (c) alignments of circles (Figure 7.5). Although these "threshold-signs" are of different shape and design they all have a linear structure and thus a specific orientation (*ibid*. 157, 158). They are in fact set vertically on orthostats and horizontally on sillstones, lintels and roofstones. Thus the axes of the motifs are oriented so as to be 'crossed' (Figure 7.6) by a person passing them (scalarforms, circle alignments and parallel chevrons are also set horizontally on kerbstones) (Robin, 2012: 150-151, 154). The art of side and final recesses is further distinguished from other locations by exclusive motifs, including inverted nested arcs, opposed triangles (Figure 7.22) and other complex combinations (Robin, 2009: 152-154, 156, 159-161). Robin (2010: 412) has argued that chamber cells or recesses (which display exclusive iconography) can be regarded as the intermediary spaces between the world of the living and the beyond, with the walls and the ground acting as symbolic thresholds separating the accessible areas of movement (chamber, passage) and the inaccessible mass of the tumulus. In this model the backstone of the chamber is interpreted as a symbolic doorway leading along the central axis and beyond the tomb towards the world of the dead (Robin, 2009: 234-237, 328, 2010, 394-395, 2012: 148-150).

7.5 Symbolic Meaning of Quartz?

There is ample evidence to indicate that a tradition of incorporating quartz into monumental structures existed across the British Isles, one which endured from the 4th through to the 2nd millennium BC and into more recent periods. It is notably visible among the megalithic tomb and stone circle traditions, where quartz was deployed in a number of ways including structural stones, cairn material and facing, scatters, deposits and in blocking material (e.g. Lynch, 1969; Henshall, 1972; Jones, 1999; Darvill and Chartrand, 2000; Darvill, 2002; Fowler and Cummings, 2003; Bradley, 2005b; Burl, 2005; Cummings, 2009, 2012; Daniel, 2013). In the Boyne Valley, the structural utilization of quartz has been recorded at the large tombs of Newgrange (O'Kelly, 1973: 140-141, 1982: 68-79, 96, 110-121; Lynch, et al., 2014), Knowth (Eogan, 1986: 47-65) and Dowth (Leask, 1933: 167; O'Kelly and O'Kelly, 1983: 146), with O'Kelly's (1982: 110-121) 'reconstructed' façade at Newgrange (see: 4.5.1) being the most contentious interpretation of its deployment (Cooney, 2006; Eriksen, 2006, 2008). These occurrences are summarized in Table 7.5.

Site	Location	Quartz Occurrence
Newgrange 1	Mound perimeter 'Roof Box' Outside tomb entrance	façade/platform closed by two blocks low oval setting and platform
Knowth 1	In the mound Eastern tomb entrance Western tomb entrance	cairn material oval setting/platform oval setting/platform
Dowth	Southern tomb entrance	façade/platform

Table 7.5: Structural utilization of quartz at the large Boyne tombs

Numerous hypotheses have been proposed seeking to explain the symbolic meanings of quartz in the British Isles during the Neolithic including suggestions that it could be representative of skulls, bone, milk, semen, ice, snow and water (e.g. Jones, 1999: 347-348; Darvill, 2002: 85; Fowler and Cummings, 2003: 14; Cummings, 2012: 32). It has also been advanced within recent discourse that quartz could have been considered to be a 'live rock' associated with healing properties derived from a fundamental association with water (e.g. Lewis-Williams and Pearce, 2005; Cochrane, 2006, 2008; Reynolds, 2009; Hensey, 2010), a connection evident in traditional Irish society (Thompson, 2004: 359-360, 2005: 116). In fact, there are numerous references to quartz in Irish mythology that suggest it had particular symbolic significance prior to the arrival of Christianity (see Thompson, 2004, 2005 for overview).

Quartz possesses rather some unusual properties that may help explain why it was considered 'special'. As highlighted by various authors (e.g. Lewis-Williams and Pearce, 2005: 259-60;

Reynolds, 2009: 156; Hensey, 2010: 113-114) when quartz rocks are struck or rubbed together, they generate an electric charge and a bright, lightning-like flash of light known as 'triboluminescence' (Whitley, et al., 1999: 236; Devereux, 2008: 193; Reynolds, 2009: 157). In discussing its use at Newgrange, Reynolds (2009: 157) proposed that where quartz was integrated into platforms this phenomenon may have formed part of the spectacle of night-time performances or ceremonies. Quartz also reflects and refracts light, giving it the ability to 'glow' and produce 'rainbows' respectively. Symbolic connections between the luminous and reflective qualities of quartz and both the sun/sunlight (e.g. Darvill, 2002: 82; Lewis-Williams and Pearce, 2005; Thompson, 2005: 130-132: 260; Hensey, 2010: 113-114) and the moon/moonlight (e.g. Burl, 2000: 226; Darvill, 2002: 85; Bradley, 2005b: 112) have been advanced and this "stone of light", referred to as 'griancloch' meaning 'stone of the sun' in Irish (Hensey, 2010: 113), has been suggested to have symbolized life, energy, renewal, re-birth or even the "soul" through a connection with fire/light (Bergh, 1995: 153, 1997: 148-149; O'Brien, 1999a: 216; Darvill, 2002: 85; Thompson, 2005: 130-131). The ability of quartz to refract light, particularly when fractured, does not appear to have received much attention in the British Isles, but Cassen (2000a: 725-727, 733-734) has discussed the potential significance of 'rainbow' symbolism in the utilization of quartz in French passage tombs. From this perspective it is worth highlighting, as noted by Lewis-Williams and Pearce (2005: 260), a significant proportion of the quartz integrated into the Newgrange façade/platform had been 'modified' and this may indicate an intention to evoke a connection with 'rainbow' symbolism.

7.6 Fertility Symbolism

In terms of potential associations between developed passage tombs (Hensey types B and C) and fertility symbolism, the concept of 'tomb as womb' (e.g. Sheridan, 1985/86: 28; Hensey, 2010: 229-231; Prendergast, 2012: 57-60) is conspicuous. This theory maintains that the beams from a male sun symbolically penetrate the womb of the female deity personified by the monument. For example, it has been argued (Sheridan, 1985/86: 28; Hensey, 2010: 229; Prendergast, 2012: 60) that from this perspective the alignment at Newgrange symbolizes "fertilisation or re-birth", including the "re-birth" of the dead or ancestors. Additionally, the sun may have been conceived as going down into the earth or the underworld after sunset, an idea which could have had resonance with the lifecycle of seeds as they go below ground to be "re-born" (Hensey, 2010: 231). The presence of standing stones at both Newgrange 1 and Knowth 1 may also be suggestive of associations with fertility symbolism. Two antiquarian reports from the early 18th century AD record a standing stone having been present on top of Newgrange 1 and a survey from 1776 AD shows that it had been removed by that date. The latter survey also recorded a triangular stone located just outside the entrance to the passage, the former location of which was confirmed during the excavations (Stout and Stout, 2008: 15). Standing stones are also situated outside the entrances to both the eastern and western tombs at Knowth Site 1, the latter being noticeably "phallic" (Eogan 1986, 48, 65; Lewis-Williams and Pearce, 2005: 215).

It has also been advanced that 'basin stones' could have represented "ceremonial querns" that were used to symbolize the transformation of the dead into ancestors (Herity, 1974: 119, 123-124; McQuillan and Logue, 2008; Hensey, 2010: 119-123) or a more generalized association with food, plenty, increase, or fertility (Hensey, 2010: 123). The eastern tomb of Knowth 1 contained two basin stones, a large highly decorated specimen found in the right-hand recess, and a portion of a second situated in the left-hand recess of the chamber. A large basin was also found midway along the passage of the western tomb (Eogan, 1986: 39-40). Four basins were discovered in the Newgrange 1 chamber, one in the left recess, a vandalised, incomplete example in the central recess, and two, one placed on top of the other, in the right recess (O'Kelly, 1982: 102-107; Stout and Stout, 2008: 53). Historical accounts raise the possibility that the upper basin could have originally occupied the end recess, but its current location may be its originally intended position (O'Kelly, 1982: 38; Hensey, 2010: 241-242). At Dowth North, the massive basin was found in fragments along the passage and has been reconstructed in the central chamber, although it may have originally have stood in the right-hand recess (O'Kelly and O'Kelly, 1983: 152-153; Cochrane, 2006: 191).

It is possible that pendants, including examples found at Newgrange 1 (O'Kelly 1982, 192-196) and Knowth 1 (Eogan, 1986: 41), are miniature versions of full-size functional pestle-hammers and may allude to the importance of a crushing or reduction process within the belief system as a pestle method may have been effective for breaking down bone (McQuillan and Logue, 2008: 19). A 17th century AD reference to a cone-shaped stone with a hole in one end located in the basin stone of the right-hand recess suggests a macehead may once have been deposited within the chamber of Newgrange 1 (O'Kelly, 1982: 196; Stout and Stout, 2008: 56). Two maceheads were discovered in Knowth 1, one (a highly decorated ovoid-Maesmawr type macehead) just outside the eastern tomb chamber, the second (a broken Orkney pestle type macehead) just outside the chamber of the western tomb (Herity, 1974: 129; Eogan and Richardson, 1982: 123-125; Eogan, 1986: 42-43, 146). It has been suggested that the former highly decorated specimen "alludes" to crushing/breaking, but may have been largely symbolic in nature (Lewis-Williams and Pearce, 2005: 220; McQuillan and Logue, 2008: 19).

A more general association with fertility may have been connected with the bone pins, stone balls, maul-shaped and pestle-hammer pendants that were recovered from Newgrange 1 (O'Kelly, 1982: 192-196) and the bone pins and pestle-hammer pendants from Knowth 1 (Eogan, 1986: 41). It is possible that the stone balls and bone pins referred to male anatomy (McQuillan and Logue, 2008: 19; Stout and Stout, 2008: 57) and the maceheads (Eogan, 1986: 179), and even the pendants could also have held similar connotations. Furthermore, it has also been noted (Cochrane, 2006: 318; Stout and Stout, 2008: 57) that the double stone balls (made of Antrim chalk) found at Newgrange 1 (O'Kelly, 1982: 195), might also support the notion that fertility, renewal or sexual practices occurred within and outside some passage tombs. Conical stone objects were found near the tomb entrances at Knowth 1 (western tomb) and Newgrange 1 (O'Kelly, 1973: 140-411, 1982: 75-76; Eogan, 1984: 164, 1986: 76 179). Both stone objects are "phallic-shaped" and as perhaps alluded to by Eogan (1986: 179) and more explicitly advanced by Cochrane (2006: 318), their discovery outside the passage tombs may suggest that that they were utilized in fertility related public performances which were enacted via simulated or even physically penetrative acts.

7.7 FIGURATIVE COSMOLOGICAL SYMBOLISM TO SOME MEGALITHIC ART?

Figurative interpretations of particular symbols and compositions found in Irish megalithic art have been advanced and two propositions that have particular longevity are the "anthropomorphic goddess" and "celestial/astronomical representation" theories (Figure 7.7; see Hensey, 2010: 163-164, 2012: 161-162; Robin, 2012: 141-144 for the history and discussion of these theories). These theories have continued to be applied to art in Brú na Bóinne. The most vocal proponent of anthropomorphic interpretations in recent decades has been O'Sullivan (1986: 81-82, 1993: 37, 40; 1997: 92-95) and Brennan (1980, 1983, 1994) has been the leading advocate of an interpretation of the art as primarily astronomical and computational, created for the explicit purpose of counting the days of the solar and lunar cycles. Such figurative explanations have however tended to be dismissed in much recent discourse and the art has come to be regarded as habitually abstract. Hensey (2010, 167-168) was correct to highlight the fact that there has been a tendency towards unifactoral explanations and his proposal that the art probably fulfilled several roles appears credible. In the current study it is argued that some motifs (e.g. 'solar symbols', 'boats', 'arboriforms', 'serpentiforms') and 'compositions' present in the repertoire of Irish megalithic art illustrate elements of solar journey mythology and three-tier cosmology (5.11), and connections with fertility (7.4-7.6) and sun-wise directionality (7.10) have been advanced.

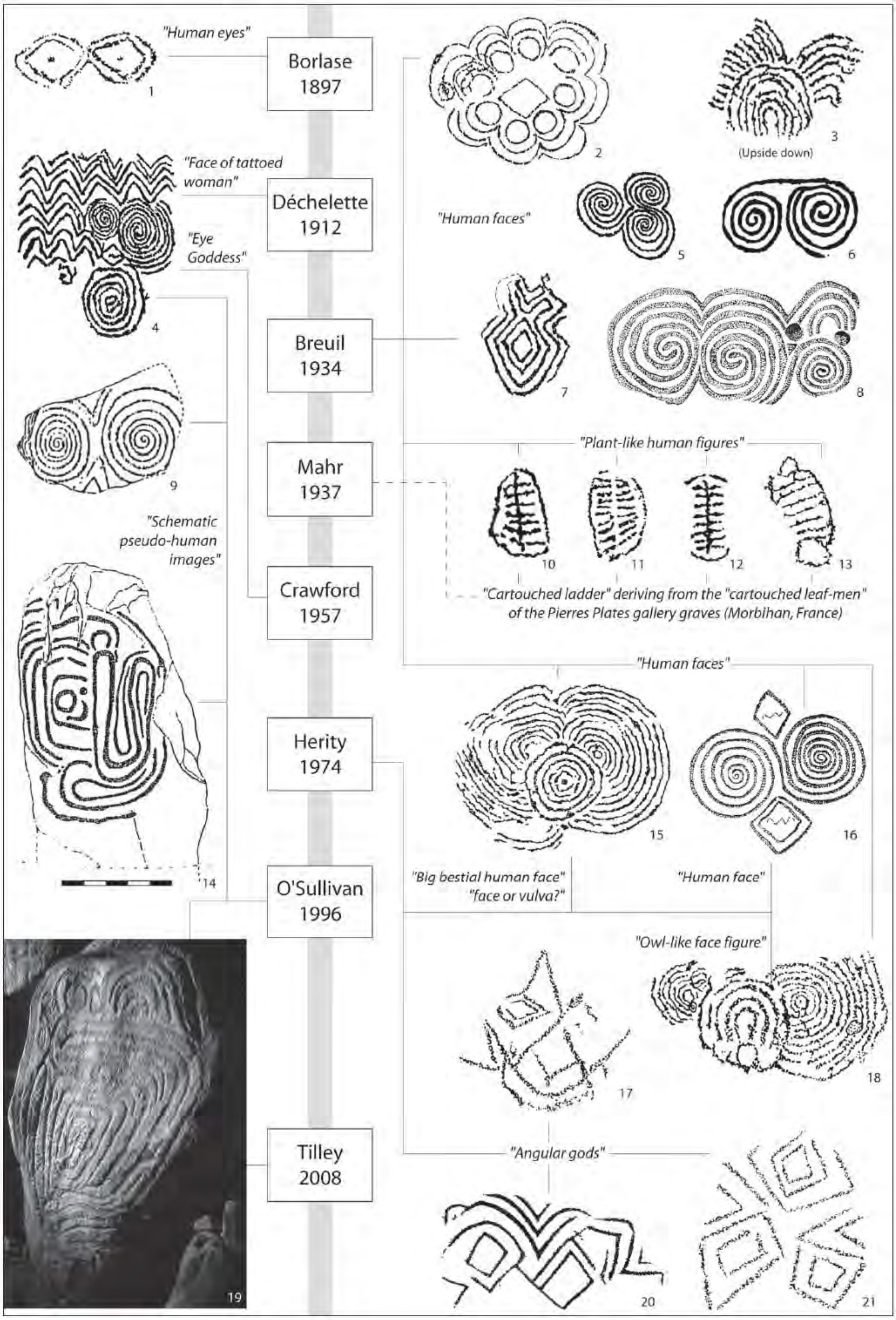


Figure 7.7: Examples of Irish and British passage tomb motifs interpreted as anthropomorphic representations. (1) Kiltierny, stone west; (2) Newgrange, roofstone of cell east; (3) Loughcrew T, orthostat C14; (4) Newgrange, orthostat L19; (5) Newgrange, orthostat C10; (6) Eday Manse; (7) Sess Kilgreen, orthostat C8; (11) Dowth North, orthostat C5; (13) Loughcrew U, orthostat C2; (14) Knowth East, orthostat 69; (15) Sess Kilgreen, orthostat C6; (16) Newgrange, kerbstone 67; (17) Fourknocks, stone C1; (18) Loughcrew U, orthostat C3; (19) Knowth West, orthostat 49; (20) Barclodiad y Gawres, orthostat L8; (21) Seefin, orthostat R4 (Robin, 2012: Fig. 10.1.)

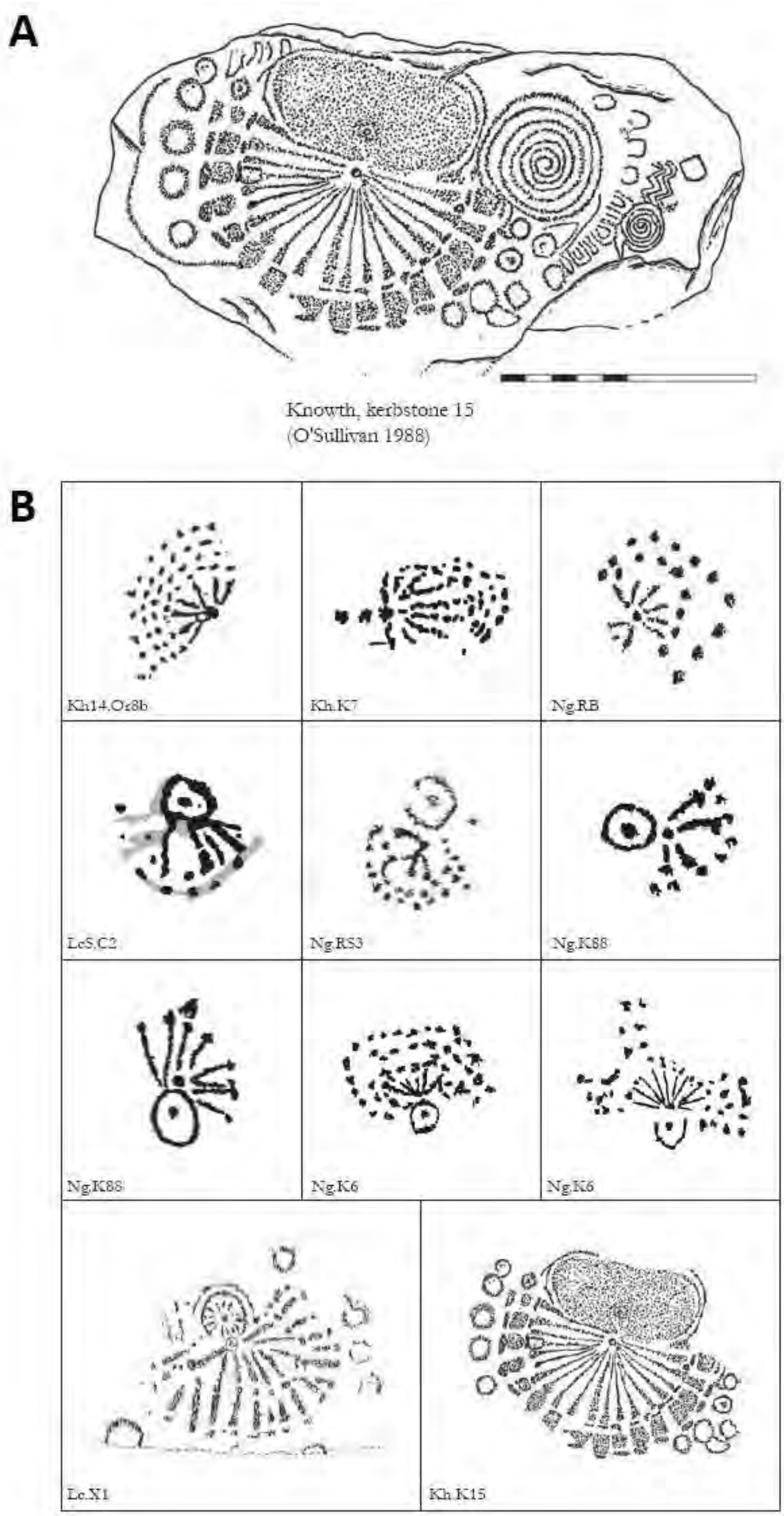


Figure 7.8: 'Sun-dial' motifs. (A) Radiate semi-circular symbols of large dimension carved in central positions (Robin, 2009: Fig. 99.); (B) Robin radiate semi-circular symbols sub-type 2c (Robin, 2009: Fig. 31.)

A controversial interpretation of megalithic art has been that it was created for the explicit purpose of calculating the solar and lunar cycles (e.g. Brennan 1980, 1994; Stooke, 1994). The current author does not find the majority of these arguments convincing, but a subset of 'rayed motifs' (Robin, 2009: 73-74, 97) do appear to have such connotations. It has been argued somewhat convincingly that two examples at Knowth Site 1 (k7, k15) could have acted as functional solar calendars (Brennan, 1980: 67-68, 115-116, 1994: 158-161; MacKie, 2013), while the others (Knowth 14,orthostat 8; Loughcrew cairn I, c13; Loughcrew cairn S, c2; Loughcrew/Patrickstown cairn X1; Newgrange 1, k6, k88, rs1, roof-box), were perhaps intended to infer or emphasize a calendrical concept.

7.8 Orientations of the Large Boyne Monuments

At Knowth the eastern passage (approx. E-W) is 40.4m long, and the western passage (approx. W-E) is 34.2m long. Both passages lead to recessed chambers (Eogan, 1986: 14-15). The Newgrange passage (SE-NW) is 24m long and leads to a cruciform chamber (O'Kelly, 1982: 13-23). At Dowth the two passages are located on the western side of the mound. The Dowth North passage (WSW-ESE) is 8.2m long and leads to a cruciform chamber with an L-shaped annexe leading from the right hand recess. Dowth South passage (SW-NE) is 3.3m long and leads to a circular chamber with a right-hand recess (O' Kelly and O' Kelly: 1983: 150-158).

7.8.1 Newgrange Alignment

Newgrange 1 is aligned upon the winter solstice (21 December) sunrise, with the sunlight gaining access to the chamber along the passage via the 'roof-box', an open slot placed above and behind the entrance defined by stone slabs, the capping stone of which was richly ornamented on its forward-facing edge (O'Kelly 1982: 21). The authenticity and precise nature of the alignment at the time of the monument's construction has been confirmed for some time (Patrick, 1974; O'Brien, 1988; Ray, 1989; Ruggles, 1999: 19). The sun first appears above the horizon over Red mountain which is over 100m above sea level, so it would have been bright prior to the sun's appearance at 08:54 and the tomb is illuminated for 17 minutes (08:58-09:15) (O'Kelly, 1982: 124; Stout and Stout, 2008: 49). Today the phenomenon occurs for 5-6 days, but it has been suggested (O'Kelly, 1982: 124; Ruggles, 1999: 19) that it would have occurred for about a week either side of the solstice originally and a narrow beam of sunlight would have "bisected" the chamber (O'Kelly 1982: 21; Ray, 1989). Two quartz blocks discovered in the roof box had been repeatedly slid in and out of place over a long period (O'Kelly, 1982: 96; Lewis-Williams and Pearce, 2005: 229; Stout and Stout, 2008: 49) allowing control and refinement of when and how light entered the monument (Hensey, 2010: 138-139). In addition, the interactions between art within the chamber

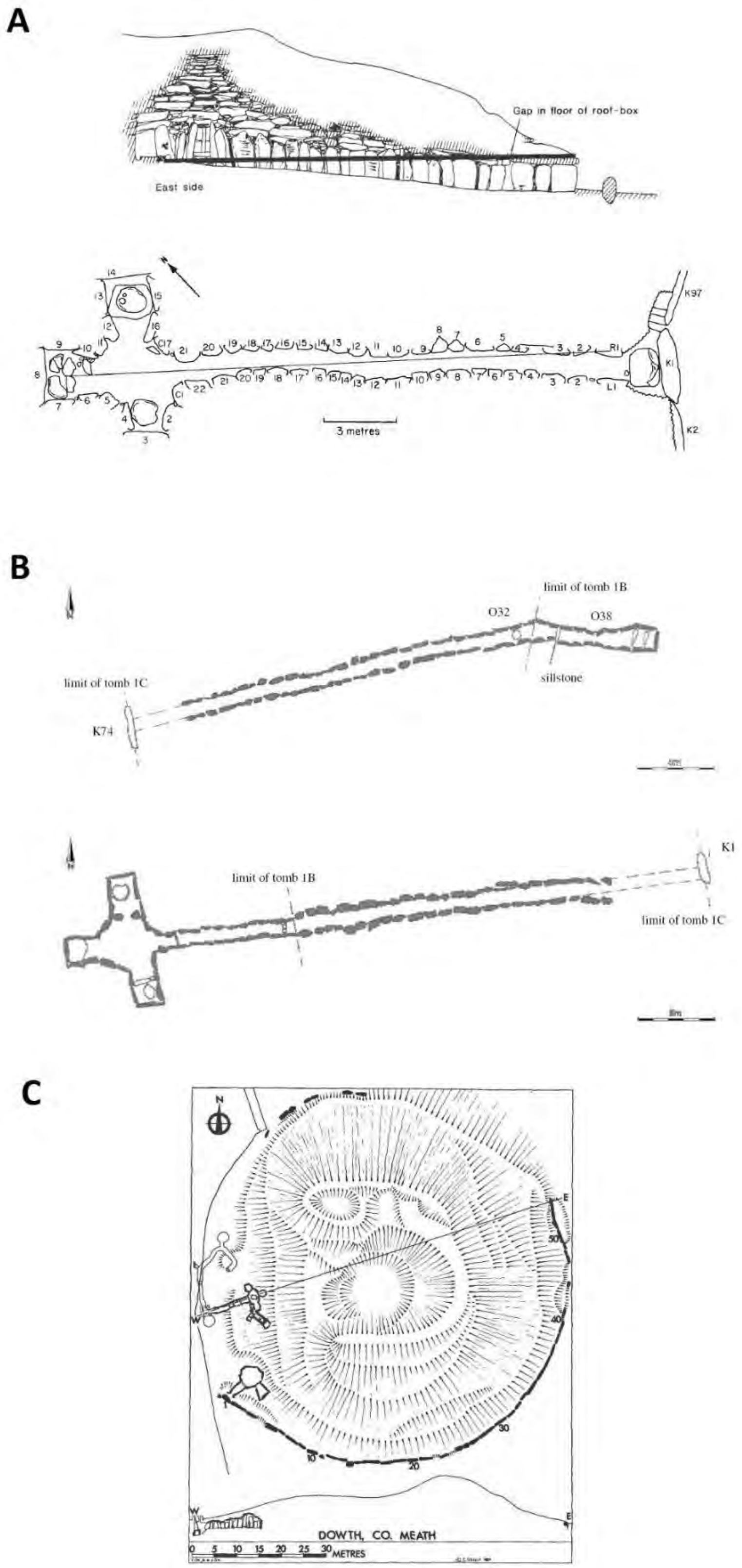


Figure 7.9: The orientation the three large Boyne Valley passage tombs. (A) Top: Plan of Newgrange 1. The marked line shows the minimum azimuth or 'first light' axis of the passage. This axis coincides with the direction of Midwinter sunrise around 3150 BC when the tomb was built (Ray, 1989: Fig. 1.); Bottom: Sectional elevation of east side of Newgrange. The path of the first rays of the sun around 3150 BC is indicated (Ray, 1989: Fig. 2.); (B) Top: Knowth 1 eastern passage and chamber. True north is shown on the plan (Prendergast and Ray, forthcoming: Fig. A2.3.); Bottom: Knowth 1 western passage and chamber. True north is shown on the plan (Prendergast and Ray, forthcoming: Fig. A2.2.); (C) Plan of Dowth. North is shown on the plan (O'Kelly and O'Kelly, 1983: Fig. 3.)

and on k52 and their respective solstice alignments have been studied and described in detail (O'Brien, 1988).

7.8.2 Knowth Alignments

The fact that the entrances to the passages at Knowth 1 are missing due to Iron Age re-modelling of the base of the mound has led to compilations in the interpretation of the orientation of the passages. Eogan (1986: 178) speculated that the alignments were on the equinoxes and Brennan (1994: 101-107) claimed to confirm it for the western passage. However, recent analysis concluded that neither the outer or (original) inner section of the western passage nor the eastern passage were aligned on the equinoxes or linked with the lunar major standstill positions (Prendergast and Ray 2002, forthcoming, 6-9, 11-12).

Knowth Passage Alignments			
(original) inner western passage	sunset	3 April 8 September	14 days after vernal/spring equinox 14 days before autumn equinox
outer western passage	sunset	4 March 9 October	17 days before vernal/spring equinox 17 days after autumn equinox
eastern passage	sunrise	26 March 16 September	6 days after vernal/spring equinox 6 days before autumn equinox

Table 7.6: Knowth 1 passage alignments (adapted from Prendergast and Ray 2002)

It may be advanced that the alignments that were identified (Table 7.6) indicate a connection with marking the beginning of the solar month falling closest to the equinoxes. Additionally, Brennan's (1994: 57-59) observation that nine days before the autumn equinox the standing stone outside the western passage begins to cast a shadow on the entrance stone of the passage and as the equinox approaches the shadow draws closer to the stone's central vertical line suggests a possible connection with marking the equinoctial dates themselves.

7.8.3 Dowth Alignments

Sunlight enters the Dowth South chamber from the beginning of October to late February (Moroney, 1999a: 11, 1999b: 30) due to its short passage, leading to potential problems in discerning the alignment (Hensey, 2010: 136). However, the winter solstice sunset orientation involving the illumination of the decorated surfaces has been verified (Brennan, 1994: 64-65, 82-85; Moroney, 1999a, 1999b; Prendergast and Ray, 2002). The sun first enters the passage at c. 14:00, the decorated stones (C7, C8, C12) are illuminated between c. 15:00 and c. 15:30 and the sun sets c. 16:05 (Brennan, 1994: 82-85; Moroney, 1999a: 13-14, 1999b: 30). In addition the decorated kerbstones located on the eastern side of the mound (including K51) are illuminated at winter solstice sunrise (Moroney, 1999a: 10). The original entrance to Dowth North was blocked in modern times meaning no direct observations can been possible. Nevertheless, it has been hypothesized that the passage could be aligned on the sunsets of the February and November cross-quarter days (Murphy and Moore, 2006: 127-129) and/or the 16 November minor southerly lunar standstill (Brennan, 1980: 30; Murphy and Moore, 2006: 127-129).

7.9 ALIGNMENTS, CALENDARS AND THE JOURNEYS OF THE SUN

It has been advanced (Brennan, 1994: 123; Prendergast, 2004: 25-29, 2009: 85-86) that the true significance of the large Boyne Valley passage tomb alignments is evident when considered as a group; that they mark the movement of the winter solar cycle from equinox to equinox, with particular focus on mid-winter. Brennan (1994: 123) has argued that the Newgrange 1 and Dowth South alignments were complimented by the orientations of K, Z, L and Z1 at Newgrange facilitating continual observation of the sun over the course of the day. Discussion of this hypothesis is outside the scope of the current study. However, the suggestion that the alignments of the large tombs were complementary can be expanded upon. As outlined previously (2.5) the prehistoric “economic year” is likely to have been “punctuated” by the equinoxes with the beginning of the “year” likely to have been marked by the start of the lunar month falling closest to the vernal/spring equinox, with celebrations possibly connected with the associated solar rising and setting (years end being associated with the lunar month closest to the autumn equinox). In this context, the Knowth (and potentially Dowth North) alignments may be connected with the turning points of the economic calendar. The beginning of the “ceremonial or religious year” is likely to have occurred with the sun’s “(re-)birth”, and connections between this and Newgrange and Dowth South mid-winter alignments may be advanced. It is also notable that alignments for both sunrise and sunset, the times that punctuate the daily journey of the sun are present at both Newgrange and Dowth. Furthermore, alignments marking both the equinoxes and the birth of the sun may be present at Dowth in the east of the valley and in combination at Knowth and Newgrange further west. It may also be advanced that the spread of the Dowth South alignment from October to February could have been associated with marking the end and/or beginning of particular activities connected with the “economic calendar” (the end of crop harvesting and beginning of the sheep/goat and pig breading seasons and both the beginning of crop cultivation and the end of furrowing, lambing/kidding) or the “darkest portion” of the year.

7.10 MONUMENT STRUCTURE AND LAYOUT – ‘SYMBOLIC’ SUN-WISE DIRECTIONALITY

As noted previously, in Britain monuments with solstice alignments include the Dorset Cursus (Barrett, et al., 1991: 50-51) and Dorchester Cursus (Bradley and Chambers, 1988: 286-287), Bryn Celli Ddu (Burrow, 2010) and Maes Howe (Mackie, 1997) in addition to various monuments within the Stonehenge, Durrington Walls (Parker Pearson, 2007: 130, 133, Parker Pearson, et al., 2006:

234-235, 239, 2007: 630) and Thornborough (Harding, et al., 2006) complexes. However, more generalized orientations towards sunrise (or sun/moon-rise and sun/moon culmination above the horizon) are evident among the Cotswold-Severn tombs and non-megalithic long-barrows (Powell, et al., 1969; Kinnes, 1992: 68; Lynch, 1997: 25). A similar orientation pattern has been noted among Irish court tombs (De Valera, 1959: 29-30), while the Irish Chalcolithic wedge tombs show an overwhelming preference for western alignments towards the setting/descending sun in autumn, winter and spring (Robb, 2001: 78; Springs, 2009: 178-191).

Prendergast (2008) has identified a number of orientation patterns among Irish passage tombs, but only 21 of the 128 monuments included in his analysis had what he considers as potentially significant solar alignments on sunrises or sunsets (*ibid*. 6-7), and as noted by Hensey (2010: 273, 278) among his 'Type B' monuments where astronomical alignments occur they tend to be 'imprecise'. In addition to alignment towards important calendrical dates it may be advanced that more generalized orientations towards the rising or setting sun indicates the symbolic importance of the cyclical daily and yearly solar journeys.

Hoskin (Chevalier, 1999: 79-80; Hoskin, 2002: 77-78), without ruling out lunar significance, has hypothesized that Iberian seven-stone antas (and other European megaliths) were laid out to face sunrise on the day construction started in the autumn and winter, citing the existence of such a practice in the building of Christian churches during the medieval period to support his argument. But, such an explanation cannot really be reconciled with monuments aligned beyond the limits of solar (or lunar) risings and settings. However, considering the way in which cosmological ideas were incorporated into the structure and layout of Roman mithraeum (1st-3rd centuries AD) raises an interesting possibility. Each mithraeum represented both a 'cosmic model' and a stage for performance involving sun-wise directional movement (Figure 7.10). In the 'ideal' mithraeum, the seat of Mithras was located at the equinoxes, represented by the image of the bull-killing Mithras in the 'cult-niche' at the 'east end' directly opposite the entrance in the 'west', with equinoctial symbols commanding the central axis of the structure i.e. the aisle between the two side benches. To Mithras' left and right were benches embellished with the southern and northern signs of the zodiac respectively. The summer solstice, signifying the gate of genesis and entry into the world of the living, was represented by a niche midway along the 'northern' bench and the winter solstice, symbolizing the gate of apogenesis and entry to the 'otherworld', by a niche midway along the 'southern' bench. In addition, sunrise was represented by the image of Cautes to Mithras' left and sunset by Cautopates to Mithras' right, both images being set on or against the bench ends. Importantly, a mithraeum's orientation was symbolic and not necessarily actual, i.e. its 'north' side was not necessarily at geographic north and the aisles did were not invariably aligned east-west in a literal sense. Furthermore, within the mithraeum sun-wise east-west directionality was indicated by the images at the eastern 'cult niche' (Mithra flanked by Cautes and Cautopates), when viewed from the western entrance and by directional movement along the aisles (Beck, 2000: 160-163; see Clauss, 2014: 247-250 for recent summary of architectural and iconographic variations).

With the majority of megaliths being customarily aligned eastwards and towards the rising sun, the backstone/rear of the chamber being to the west, was symbolically located at 'sunset'. It could also be advanced that the structure and layout of megaliths could have referenced this 'cosmological ideal' irrespective of orientation (Figure 7.10). In this context it may be suggested that in the case of monuments that it was possible to enter, particularly those accessed through a passage, movement towards the chamber could have symbolized sun-wise directionality from 'sunrise' to 'sunset'. It may also be advanced that similar symbolic reference to sun-wise directionality from 'sunrise' to 'sunset' may be indicated by the concentration of depositions around and opposite the entrances of Late Neolithic timber circles, as identified at such sites as Knowth (Meath) (Eogan and Roche, 1997: 101-120), Paulstown (Kilkenny) (Elliott, 2009; Carlin, 2011: 175-179) and the Southern Circle at Durrington Walls (Wiltshire) (Wainwright and Longworth, 1971: 24-25, 396-401; Parker Pearson, et al. 2006: 241-242, 2007: 631, 2008: 162-163; Thomas, 2007: 149-151).

In addition, symbolic reference to sun-wise directionality could also have been connected with the differentiation of left and right hand side of chambers if the backstone/rear of the chamber also symbolized 'south'. For instance, a emphasis on the right-hand side of the monument has been observed in the court tomb tradition (Herity, 1974: 123) and is also frequently noted in passage tombs (Shee Twohig, 1996: 79; O'Sullivan, 1997: 26; Bradley, et al., 2000: 60; Robin, 2009: 162, 2010: 397, 400, 403, 405, 407, 412; Hensey, 2010: 57-58). In the case of the latter it may be particularly notable that Robin (2009: 326-327) identified a spatial opposition between the two categories of 'rayed' symbols, the circular motifs being mainly located in the left half of the tombs and semi-circular signs in greater numbers in the right half. It may be advanced that these symbols reference 'sunrise' and 'sunset' respectively and the emphasis of the right-hand side of monuments a symbolic connection with 'sunset', irrespective of orientation. It may also be notable that the stone located on the right wall of the passage at the junction with the chamber in both Barclodiad y Gawres on Anglesey (orthostat c16) and Knowth tomb 17 (orthostat 15) feature the same combination of a spiral, chevrons and lozenges on their upper parts (Robin, 2010: 389, 2012: 150). Similar symbolic inferences may also have informed the customary siting of passage

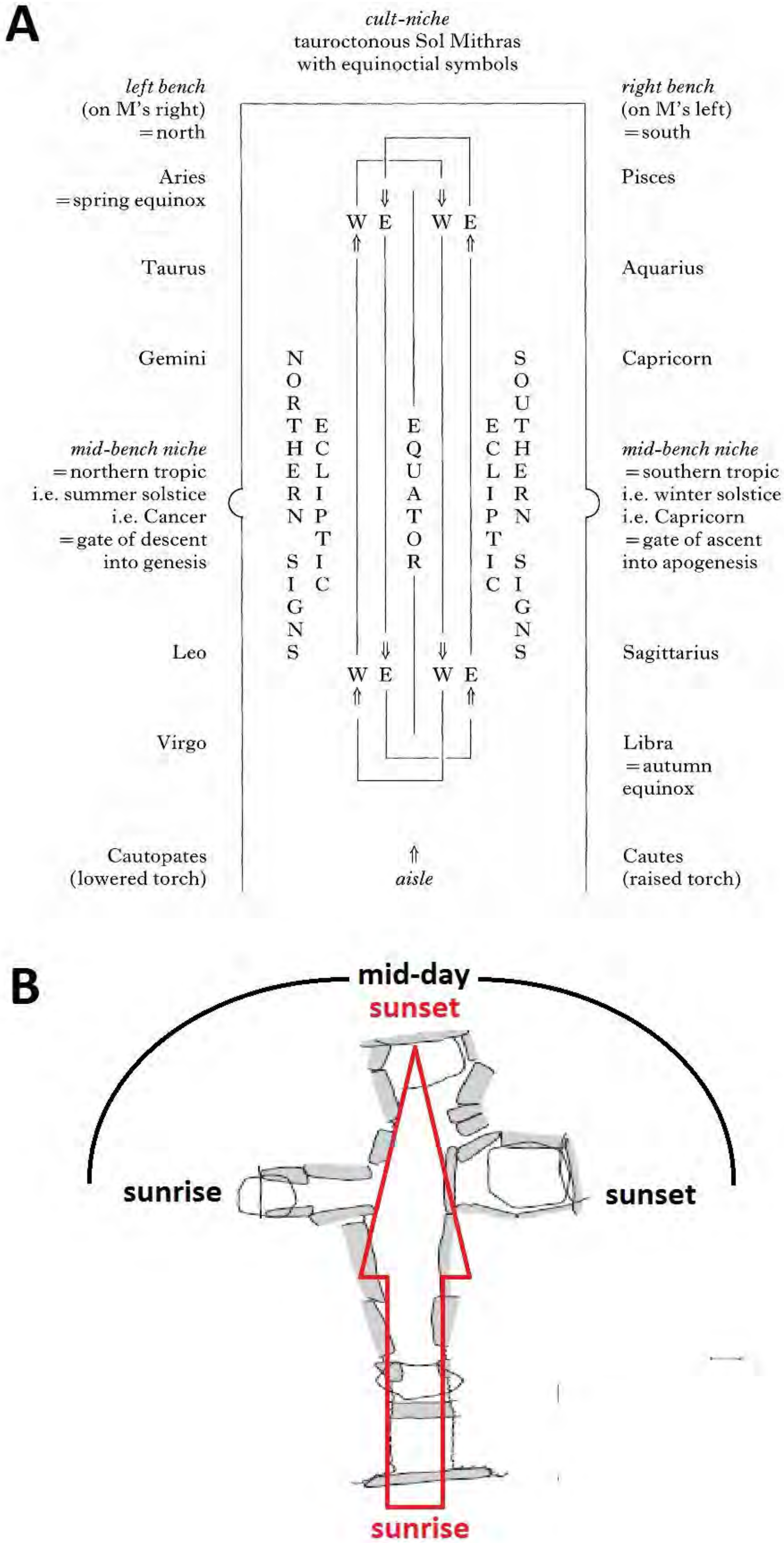


Figure 7.10: Monumental layouts symbolically referencing 'cosmic models' and sun-wise directionality. (A) The Mithraeum as image of the universe (Beck, 2000: Fig. 2.); (B) Graphic representation of proposed references to sun-wise directionality with example of cruciform passage tomb structure (image by author)

tombs long-ways on the east-west axis of ridges (Herity, 1974: 156; Cooney, 1990: 743; Cochrane, 2006: 309).

Outside Ireland the same principles may also have informed the deposition of funerary objects within the Cotswold-Severn tomb at Ty Isaf (Powys) in north Wales (Cummings, et al., 2002: 64; Robin, 2010: 407) and the potential sexual partition of the funerary space within tomb B of the passage tomb at Vierville (Normandy) and the wooden burial gallery of Vignely (Paris Basin) in France (Chambon, 2003: 122-137; Dron, et al., 2003: 283; Robin, 2010: 410). It is also notable that the western compartment is longer than the eastern one in many of the east-west orientated chambers (which have southern entrances) of the passage tombs in Mecklenburg-Vorpommem, northern Germany (Pásztor and Roslund, 1997: 230-231) and this may hint at sun-wise directionality playing a role in the into the structure and layout of TRB megaliths (and others on the Continent).

7.11 Geography – relationship with the 'Journey of the Sun'

As discussed in the previous chapter the mythological story of the birth of Óengus Mac ind Óc, the son of the Dagda and Bóand appears to contain references to the association between the daily and yearly journeys of the sun. Óengus was conceived and born both over the course of nine months and in a single day. His birth occurred at mid-winter, indicating that he was simultaneously conceived at the spring equinox and born at the winter solstice over a nine month period and conceived and born in a single day at the winter solstice. As outlined above, alignments marking sunrise and sunset at the spring equinox and winter solstice are present in combination at Dowth, Knowth and Newgrange. These orientations appear to reflect the mythology of the solar journeys and the birth of Óengus Mac ind Óc.

It may be possible to suggest that a sub-division of symbolic associations exists among the large Brú na Bóinne tombs. Newgrange with its winter solstice sunrise alignment is central to this symbolism which joins the yearly and daily journeys of the sun to the river. In the context of the yearly journey Knowth (spring equinox associated lunar month alignment) and Newgrange (winter solstice sunrise) mark the nine month period from the conception to the birth of the sun. In the context of the daily journey Newgrange (winter solstice sunrise) and Dowth (winter solstice sunset) mark the daily conception, birth and death of the sun. In conjunction the three monuments tie together the daily, yearly and eternal journeys of the sun. Additionally, with Newgrange and Dowth being located on separate meanders there may be a suggestion of symbolically moving from an old to a new ceremonial or religious year over the course of the winter solstice.

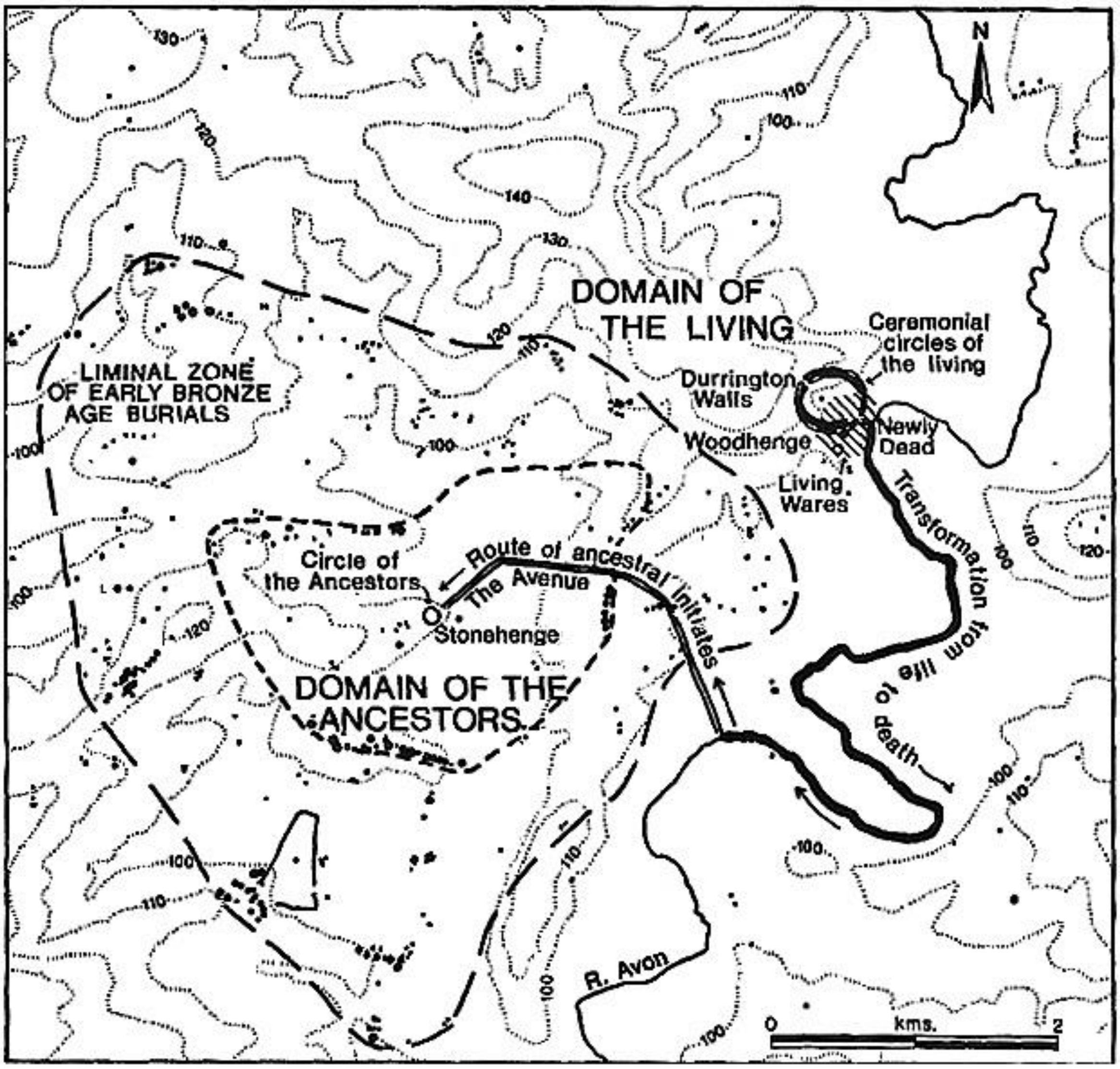


Figure 7.11: The hypothesized link between Durrington Walls and Stonehenge c. 2500-2000 BC (Parker Pearson, et al., 2006: Fig. 1.)

7.11.1 The Winter Solstice and movement between locations

The possibility of ceremonial processions featuring prominently during winter solstice celebrations in the Boyne Valley must be considered, especially in light of suggestions that movement between sites occurred along the River Avon in Wiltshire, southern England. In this context Parker Pearson et al. (2006: 237-238, 243-247) have argued that large-scale Late Neolithic-Chalcolithic winter solstice celebrations involved procession along the River Avon. At Durrington Walls and Stonehenge ceremonial processions are also indicated by the solstice aligned avenues leading from the monuments to the river banks (Figure 7.11). They also suggested that this mid-winter journey could have involved the riverine deposition of human remains along the two-mile stretch of the River Avon between Durrington Walls and Stonehenge.

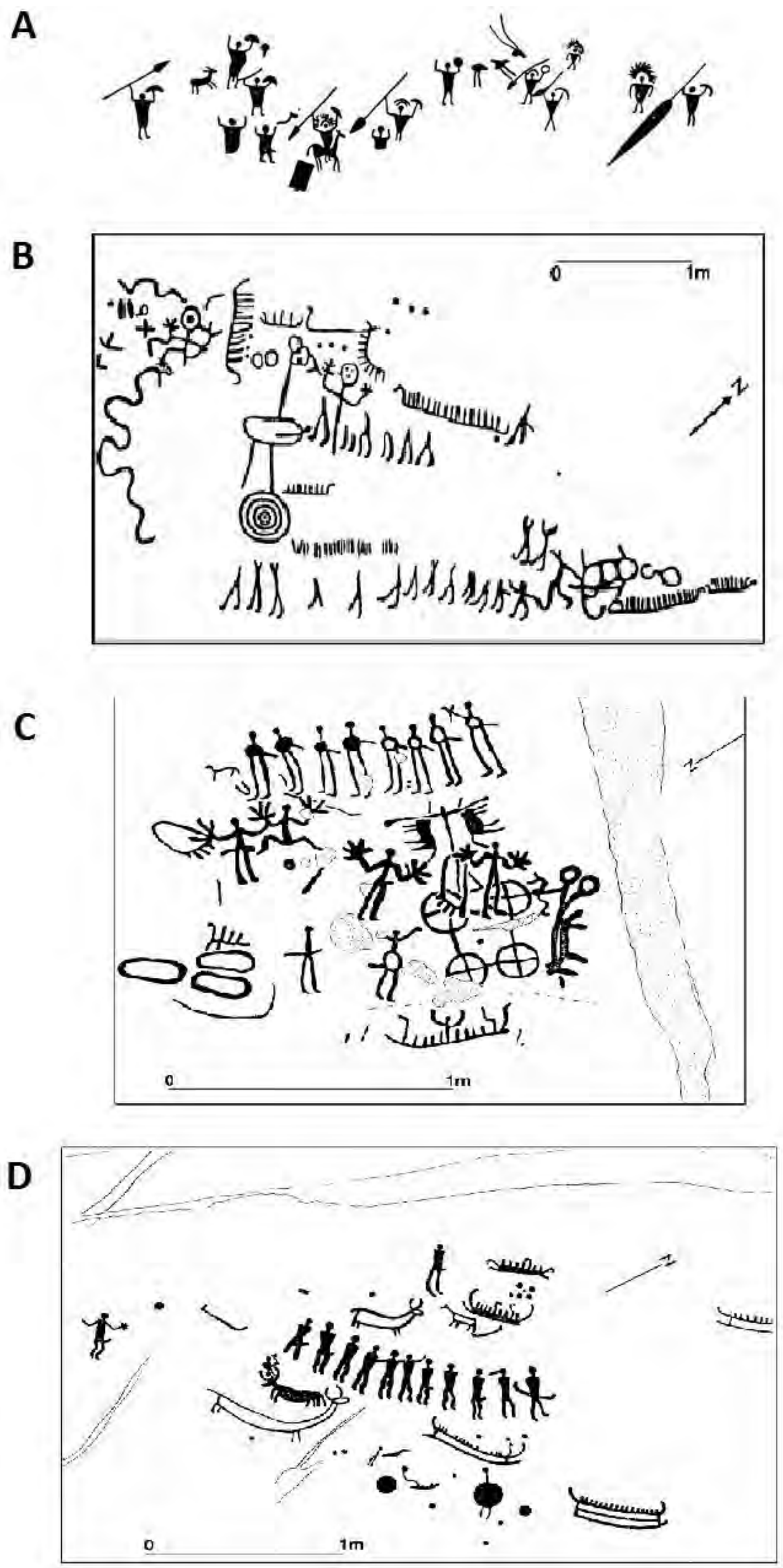


Figure 7.12: Examples of procession in rock art. (A) The "Great Rock" of Naquane, Valcamonica (Italy) Anati, 2008: no figure number); (B) Evenstorp Älvsborgs Län (adapted from Coles, 2003: Fig. 24.); (C) Tanum 25, Aspeberget (adapted from Coles, 2003: Fig. 4.); (D) Askum 70.1, Rished (adapted from Coles, 2003: Fig. 12.)

Processions of human figures have been recorded at various Bronze Age rock art sites (beginning c. 1700 BC) in Scandinavia (Figure 7.12; Coles, 2003) suggesting connections between such activities and commemoration of the solar journey and it may also be notable that possible processional sequences of figures (horseman, dog, deer with 'solar' antlers, and aquatic bird) occur among the LBA (after 1200 BC) rock art panels at Serandina I (Rock 12), Valcamonica (Lombardy) in northern Italy, and feature overt references to solar journey imagery (Marretta, 2015: 113). Ceremonial processions with overt solar directionality is not unprecedented, and for example appears to have been a feature of the initiative practices of Roman Mithraic cult (1st-3rd centuries AD) which involved a 'procession of the sun-runner' (Beck, 2000: 147-148, 154-165)

7.11.1.1 Boyne Valley

At Knowth, Dowth and Newgrange there is architectural evidence which appears to indicate that outdoor public ceremonies, with particular focus on the entrance areas, were important features of calendrically scheduled communal events. This includes the straightening of the façades, the greatest concentrations of art, and other elaborations, including the utilization of large kerbstones and quartz, and the presence of fore-courts and stone settings (Eogan, 1986: 30, 46-48, 179; Sheridan 85/86: 25; Thomas, 1993: 88-89; Stout and Stout, 2008: 28, 59-60; Bradley, 2009: 73-74; Hensey, 2010: 172). The proposition (e.g. Lewis-Williams and Pearce, 2005: 248; Stout and Stout, 2008: 28) that limited numbers of individuals engaged in activities in fore-court areas and entered the monuments on significant occasions is probably correct. The vast majority of people were probably amassed in "public spaces" outside the tombs. For instance, as noted by Stout and Stout (2008: 16) at Newgrange 1, a large crowd could have congregated on the terrace in front of the tomb and thousands more on the next terrace. In addition, the large flat-topped tumuli of Knowth, Newgrange and Dowth would certainly have been conducive to considerable numbers either stationed upon or processing across them (Lewis-Williams and Pearce, 2005: 243-244; Stout and Stout, 2008: 15). It has been suggested that the decorated kerbs of Newgrange 1 (O'Kelly 1982; O'Sullivan 1986, 1993: 22; Stout and Stout, 2008: 22, 24-25) and Knowth 1 (O'Sullivan 1986; Eogan, 1996; Bradley, 2009: 73-74), which include visually prominent compositions around the entrances, may indicate that clockwise or anti-clockwise processions around the mounds could have been important activities during large-scale communal events (e.g. Eogan, 1986: 178-179; Thomas 1990; 1992; Shee Twohig, 2000; Lewis-Williams and Pearce, 2005: 248; Jones, 2008).

Viewshed analysis (Davis et. al, 2010a, 2010b) highlights a number of interesting patterns concerning the visibility of the large passage tombs from different parts of the Boyne floodplain and may also provide indications about patterns of movement around the valley during the

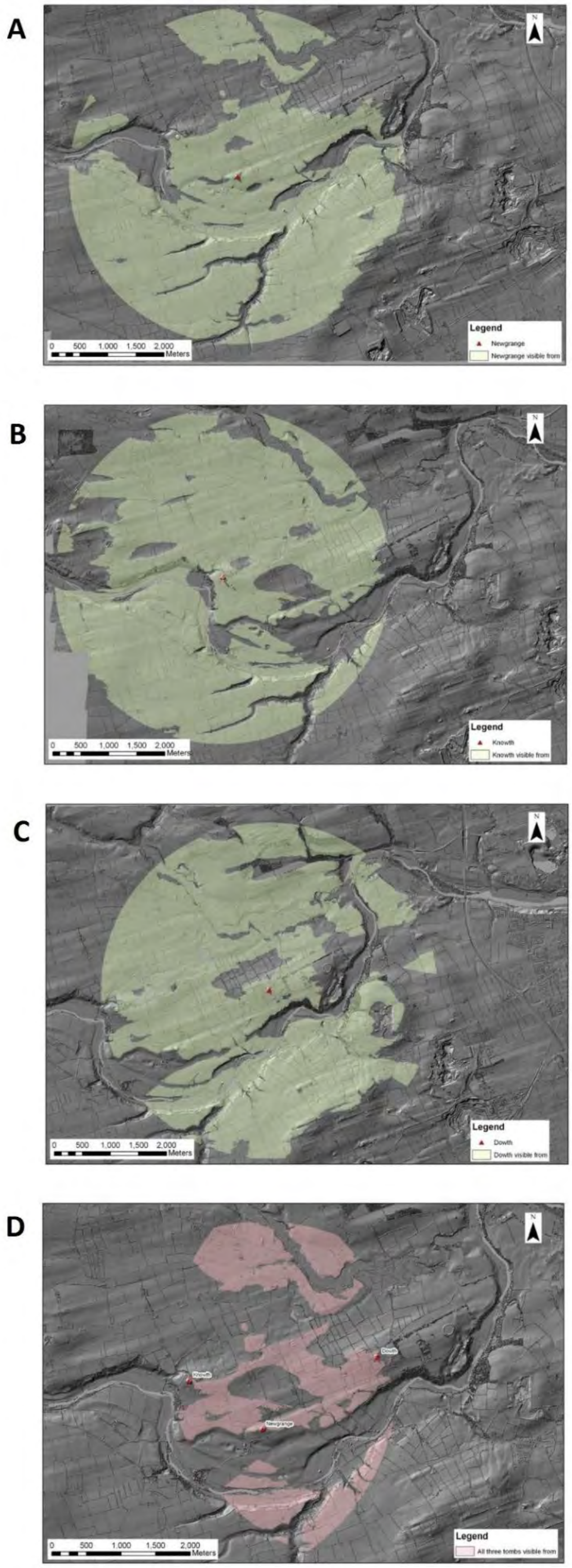


Figure 7.13: Viewshed analysis of views of the large Boyne tombs. Parts of the landscape from which (A) Newgrange, (B) Knowth, (C) Dowth are visible, and (D) a cumulative viewshed (Davis, et al., 2010b: Fig. 28.)

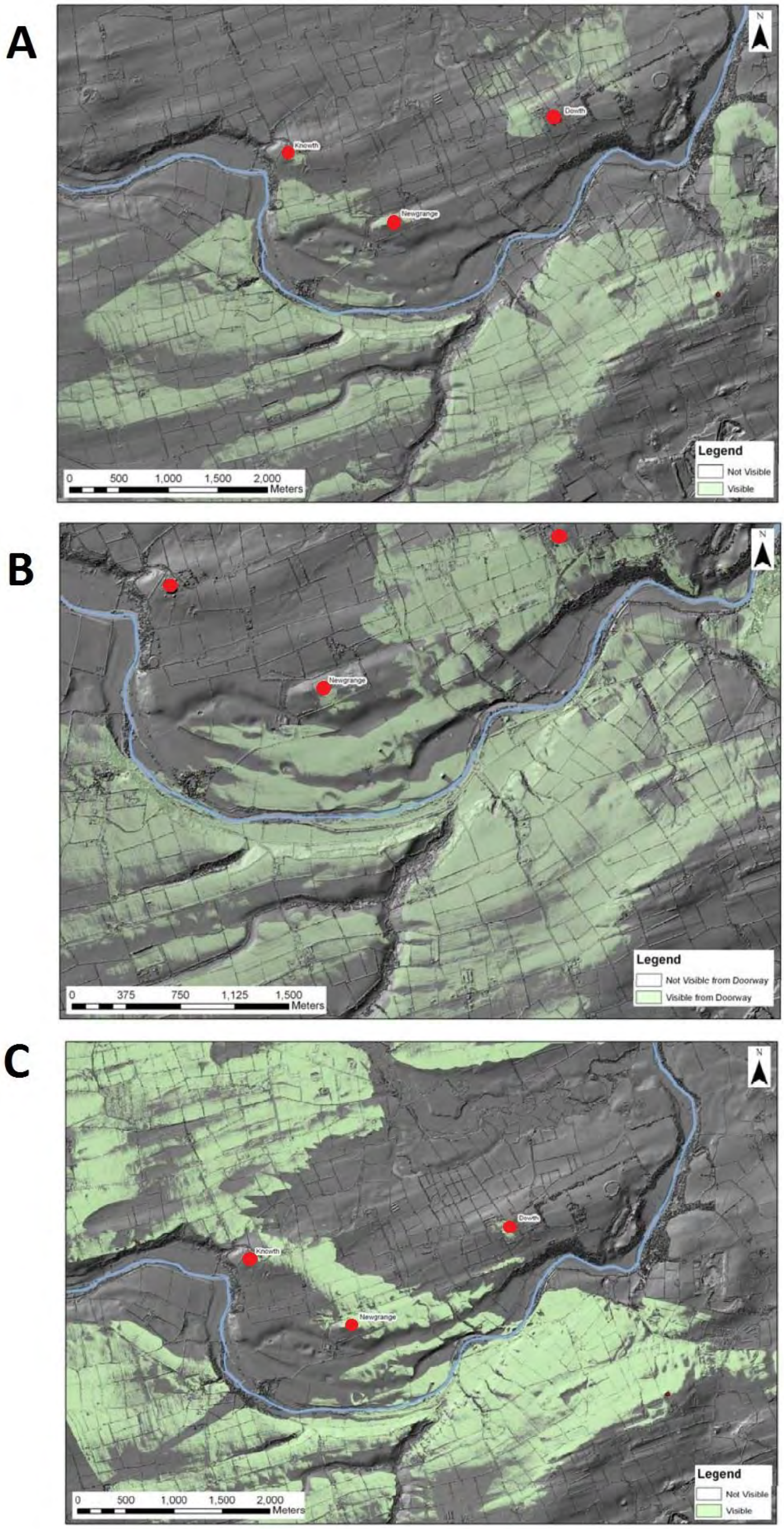


Figure 7.14: Viewshed analysis of views from the entrances of the large Boyne tombs. (A) Newgrange, (B) Knowth, (C) Dowth (adapted from Davis, et al., 2010b: Fig. 29a-c)

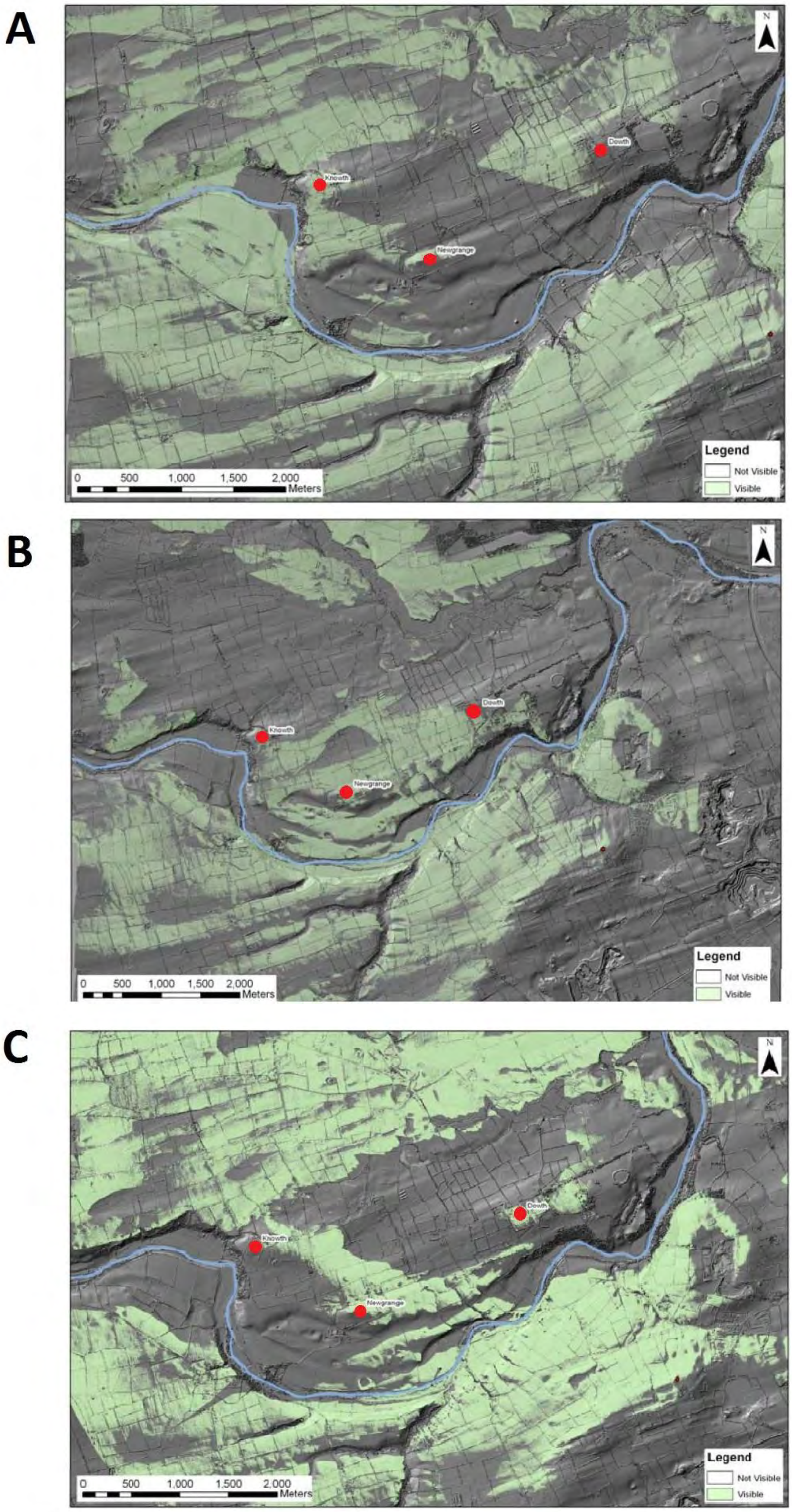


Figure 7.15: Viewshed analysis of views from the bases of the large Boyne tombs. (A) Newgrange, (B) Knowth, (C) Dowth (adapted from Davis, et al., 2010b: Fig. 29a-c)

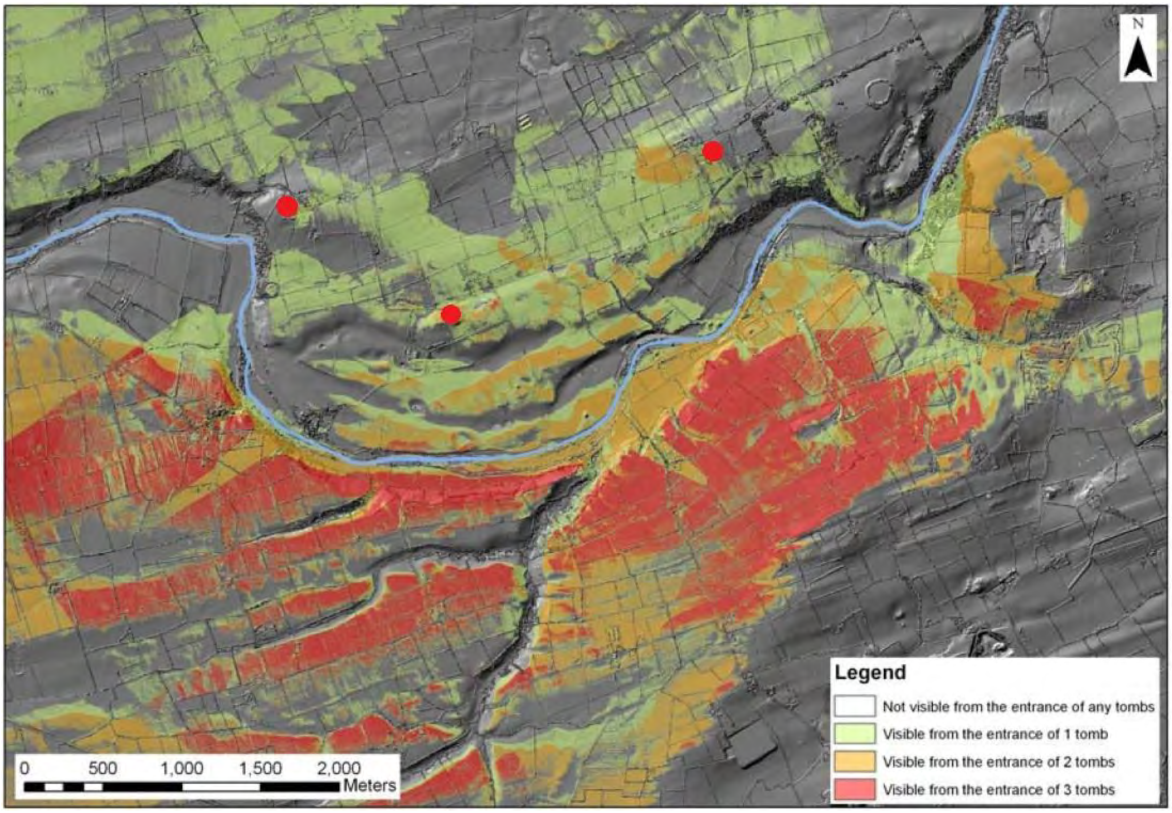


Figure 7.16: A cumulative viewshed from the entrances of the large Boyne tombs (Davis, et al., 2010b: Fig. 30.)

Middle Neolitic (Figure 7.13, Figure 7.14, Figure 7.15, Figure 7.16). As was noted elsewhere (e.g. Lewis-Williams and Pearce, 2005: 198), the large passage tombs are situated in elevated positions and are generally intervisible. However, intervisibility of the tomb entrances is low, Dowth's being the only one visible from the others, and the majority of the landscape area visible from all three tombs lies on the south side of the river (Davis, et al., 2010a: 13, 2010b: 59-65). Davis et. al (2010b: 52-56) also noted that Knowth is most visible from the west, while Newgange is most visible from the monuments spread across the southern part of the floodplain. Knowth is largely invisible from areas east of Newgrange, Dowth is largely invisible from areas west of Newgrange and the area immediately east of Dowth is visually isolated from all three tombs. The tombs are not visible from much of the northern floodplain, apart from the concentration of monuments located on the elevated area around the Mattock River (especially those on its southern banks) which appear to have been situated with the intention of accommodating visibility of all three. It may be advanced that these visibility patterns suggest (a) that movement between the northern floodplain and the Knowth, Newgrange and Dowth complexes would have proceeded via the monuments on the southern banks of the Mattock; (b) that Newgrange represents a 'hub' for movement around the southern area; (c) that direct movement between Knowth and Dowth may have been restricted or absent; and (d) the northern banks of the River Boyne may have been a key feature of movement between the three main complexes. Possible directional movement associated with Newgrange and Dowth during the period of the winter solstice will be considered further below.

7.11.1.1.1 Indicated directional movement at Newgrange

The c. 100m long Newgrange 'cursus' extends from the Mattock valley to the Newgrange ridge where it ends in a rounded bank (Lewis-Williams and Pearce, 2005: 246). This is certainly evocative of procession between the concentration of monuments around the Mattock/Boyne confluence and the Newgrange complex. At Newgrange, procession around the large mound, in a similar fashion to that suggested for Knowth (Eogan, 1986: 178-179), in addition to observation of the solstice sunrise could have featured among the activities undertaken. Stout and Stout (2008: 6-7) have argued that because many ceremonial sites were approached via indirect routes, the modern route to the passage at Newgrange, from the south-west and climbing to the top of the ridge before turning east to the entrance, may emulate the direction of prehistoric movement between these two areas. If correct, then movement from Newgrange 1 to the visually connected southern monuments could have followed this route. Furthermore, if there was movement along the river between the Newgrange complex and Dowth on the winter solstice the latter area appears to be a likely point of departure.

7.11.1.1.2 Indicated directional movement at Dowth

Two possible routeways were recently identified at the Dowth complex (Figure 7.17). One a possible raised routeway (20m wide x 1.4km long) could represent a roughly east-west processional route running between (or past) the destroyed Cloghalea stone circle, through Dowth Henge to Dowth passage tomb (Davis, et al., 2010a: 2, Fig. 5, 2010b: 32-33). If this is a routeway, it could suggest that activity within the Dowth complex involved movement directed to and from the river, in addition to observation of the solstice sunset and potentially procession around the mound. The second possible routeway (c. 40 m wide x >1km long) is double-banked in the style of Neolithic cursus monuments and runs north-west from the Dowth Passage tomb towards the River Mattock (Davis, et al., 2010b: 34). The entire monument was not identified and it was advanced (*ibid*.) that it either (a) continued towards the Mattock River and connected northern and southern parts of the valley, or (b) curved westwards towards Newgrange and Knowth.

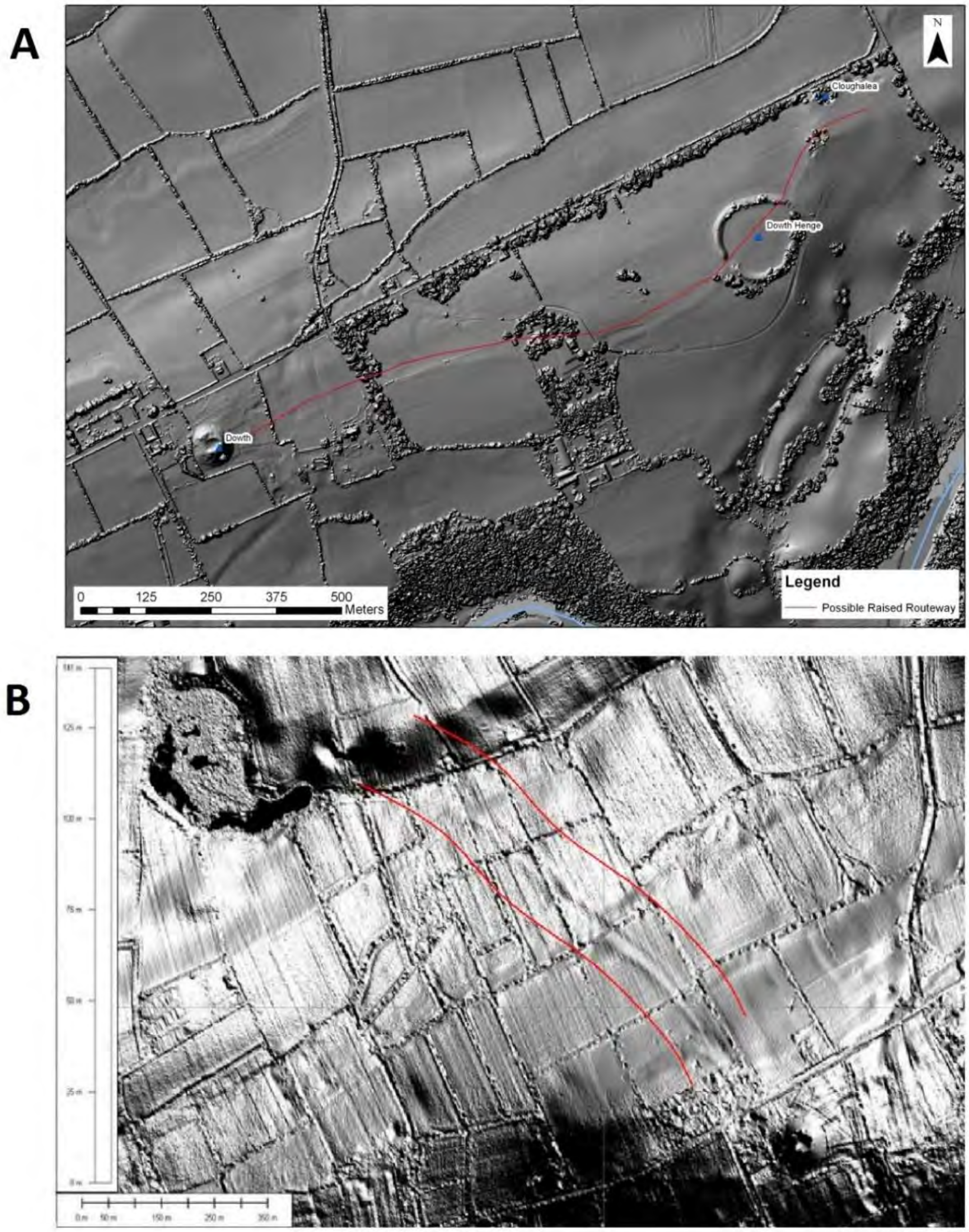


Figure 7.17: Possible cursus monument at Dowth. (A) Dowth possible routeway or boundary from Cloughalea to passage tomb (Davis, et al., 2010b: Fig. 16.); (B) Possible cursus monument running northwest from Dowth (Davis, et al., 2010b: Fig. 18.)

7.11.1.2 Movement around the Boyne Valley

In addition to movements and procession around the Newgrage and Dowth complexes themselves during the Middle Neolithic, a number of possibilities may be proposed concerning movement to and from the large Newgrage and Dowth tombs around the time of the winter solstice (Figure 7.18). Firstly, it may be advanced that directional movement between the north and south of the Boyne Valley could have involved (i) movement along the Newgrange cursus;

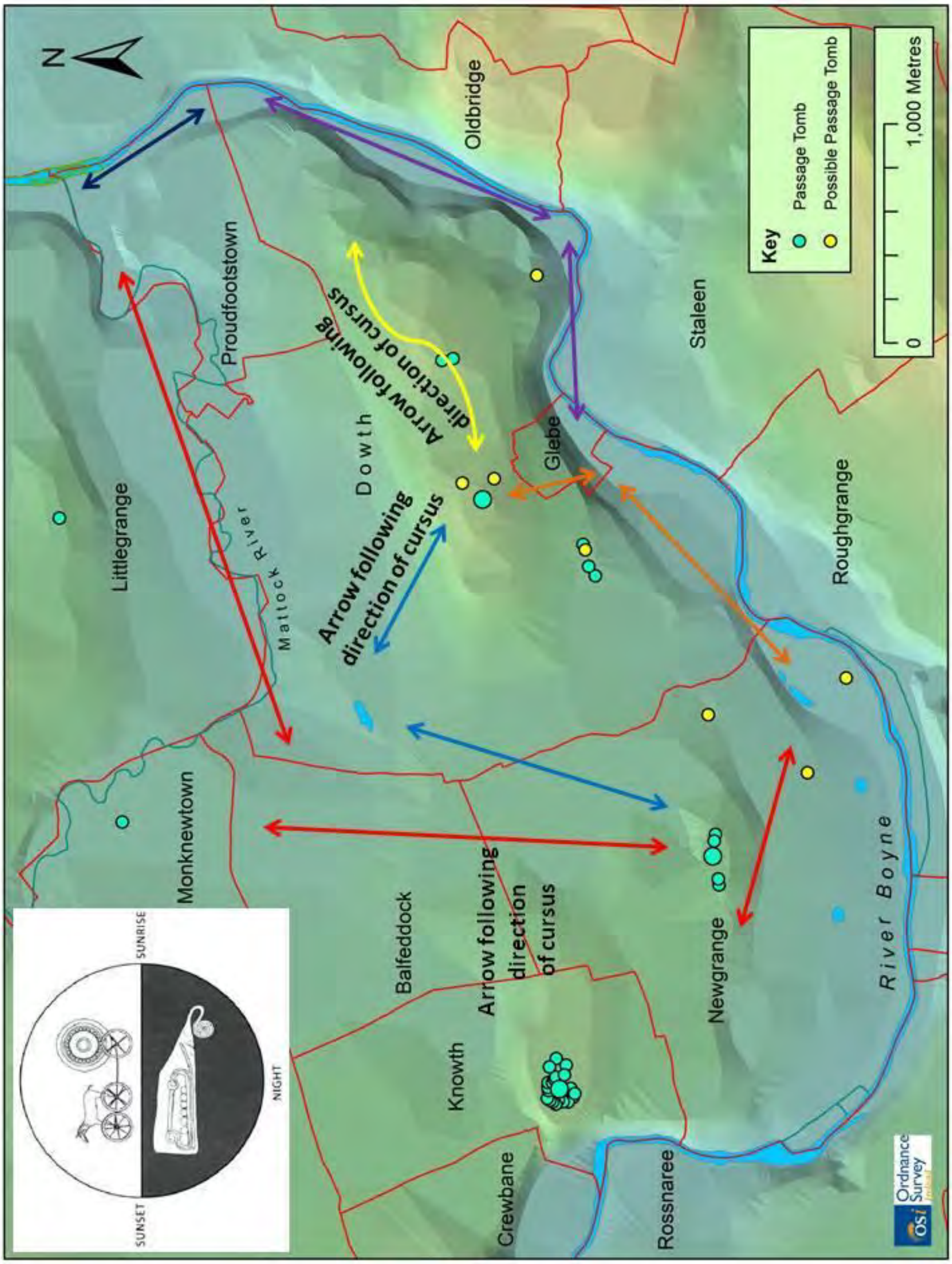


Figure 7.18:Possible directions of movements around the Boyne Valley to, from and between the large passage tombs at Newgrange and Dowth during the Middle Neolithic. Passage tombs and possible passage tombs marked (image by author and Joe Fenwick NUIG, © Ordnance Survey Ireland core data. All rights reserved. Licence number NUIG230615; Lidar data reproduced courtesy of The Discovery Programme, The Heritage Council and Meath County Council)

(ii) movement along the Dowth cursus; or (iii) movement along the river/eastern periphery between the Boyne/Mattock confluence and the area to the east of Dowth. In the case of the latter route the monuments located across the valley would have been largely invisible. Secondly, if there was movement between the Newgrange and Dowth complexes, it could have followed the river along which good views of various monuments contained within both complexes are accommodated before reaching the meander situated to the south-east of Dowth. An alternative northern route, along which views across the landscape would have been restricted, may be indicated if the possible Dowth cursus did in fact swing westwards towards Newgrange.

These possible routes and the idea that during the Middle Neolithic people moved around the Boyne Valley on the winter solstice raises a question about who, if anyone, was observing the various solar phenomena taking place because both sunrise and sunset phenomena are present at Newgrange and Dowth. If both were visited over the course of a single day at the time of the winter solstice then all of these alignments could not have been observed by a single congregation. This indicates that either the penetrative phenomena (Newgrange, sunrise; Dowth, sunset) or the sunlight hitting the backstones (Dowth, sunrise; Newgrange, sunset) were observed, or the community was in some way divided between the two sites and these concurrent events were in fact witnessed (unfortunately this possible scenario cannot be engaged with further within the current study). Alternatively, as the solar phenomena were observable over a period of weeks around mid-winter, a scenario involving an "extended" event involving the visitation of Newgrange, Dowth and other sites over the course of a number of days may be advanced.

Journey	Period	Direction	Solar Journey Replicated	South Route		North Route
				Flow of River	Monuments Visible	Monuments Visible
Newgrange to Dowth	Day	west-east	Night-Time	With	No	No
Dowth to Newgrange	Night	east-west	Day-time	Against	Yes	No
Dowth to Newgrange	Day	east-west	Day-time	Against	Yes	No
Newgrange to Dowth	Night	west-east	Night-Time	With	No	No

Table 7.7: Possible symbolic connections between the daily journey of the sun and directional movements between Newgrange and Dowth

There are some interesting possibilities in terms of possible symbolic connections between the daily journey of the sun (day-time, east-west; night-time west-east), and directional movement between Newgrange and Dowth as outlined in Table 7.7. The day-time journey from Newgrange to Dowth followed by a night-time return journey would result in a strange "reversal". After viewing sunrise at Newgrange, movement to Dowth for sunset as the sun travels westwards would symbolically replicate the night-time journey of the sun. A night-time return journey would then replicate, at least in terms of direction, the day-time journey of the sun. In contrast, the solar journey would be followed during a daytime journey from Dowth to Newgrange followed by a night-time return journey.

In this context an additional layer of reversal concerns the possibility of taking either a northern route away from the river or a southern route along the river, the directional flow of the river and the visibility of monuments. If the river was followed during a daytime journey from Newgrange to Dowth then (a) the night-time solar journey would be referenced, (b) movement would be with the flow of the river, and (c) in terms of viewshed, monuments would be visible. However, if a northern route was followed (a) the night-time solar journey would be referenced and (b) in terms of viewshed, monuments would be invisible. This and the other permutations are outlined in Table 7.7. What is notable is that when taking the possible southern route along the river where the monuments are visible in terms of viewshed, as they would be during the day, the direction of movement is either against the flow of the river but replicating the direction of the daytime journey of the sun or following the flow of the river but directionally replicating the night-time solar journey. Only a night-time journey between Newgrange and Dowth along a northern route does not contain any obvious elements of reversal, as the night time journey of the sun would be symbolically followed and monuments would be invisible both in terms of viewshed and the fact it would be extremely dark at night around mid-winter. It was proposed above that with Newgrange and Dowth being located on separate meanders there may be a suggestion of symbolically moving from an old to a new ceremonial or religious year over the course of the winter solstice and it is possible that some of these symbolic "reversals" were in some way tied into such an idea.

7.12 EARLIER NEOLITHIC BOYNE VALLEY: BUILDING MATERIALS AND SHARED IDENTITY

The materials utilized in the construction of monumental structures could have held symbolic significance to those who constructed them in a variety of ways. For example, it has been advanced that the materials incorporated into Early Bronze Age earthen barrows could provide clues about the identity of those interred within them and/or the relationship between deceased individuals and groups of mourners (Owoc, 2002; Jones, 2002; Brück, 2004). It is also possible that the colour of the materials incorporated into monuments could have resonated with cosmological ideas, dualistic concepts (e.g. day/night, fire/water, life/death) or other forms of symbolism (e.g. Jones, 1999; Cassen, 2000a: 722-727, 733-734; MacGregor, 2002; Owoc, 2002, 2004; Scarre, 2004a; Cochrane, 2006: 326-327; O'Sullivan, 2006: 667; Midgley, 2010: 58-61; Cummings, 2012: 32-41; Darvill and Wainwright, 2014a, 2014b). Materials could also have provided connections to significant places in the landscape (Jones, 1999; MacGregor, 2002; Bukach, 2003; Richards, 2004; Darvill and Wainwright, 2014a, 2014b). In this context in should also be noted that monuments could also be constructed at locations that were themselves important. As argued by Scarre (2004b: 145-147) in the case of various tombs in northern Europe and Portugal which were erected at the sites where the stone was excavated, the very presence of these stone sources could have contributed to the 'special' character of these locations.

It is feasible that such pre-existent importance could also have contributed to the choice of building location for some monuments in the British Isles. For example, it has been noted that portal tombs at Altdrumman, Co. Tyrone, Ballymacdermot, Co. Armagh (Cooney, 2000: 130, 2007: 142; Cummings, 2009: 99) and Arderrawinny, Co. Cork (O'Brien, 1999a: 73-74) were all constructed close to outcrops from which they were quarried. Similarly, the chambers of the multi-phase long-cairn at Trefignath, on Anglesey were constructed of stones quarried from the outcrop on which the megalith was built (Smith and Lynch, 1987). It is also feasible that the notable concentration of wedge tombs and other monuments at Roughan Hill on the Burren in Co. Clare, where a slab quarry has been documented (Jones, 2004: 68), developed because it was a location of particular symbolic significance (Jones, et al., 2105).

However, evidence indicates that during the fourth and third millennia BC, both on the Continent and the British Isles, numerous monuments were constructed from materials transported over many kilometres. In such instances, a monument could have been connected to significant places within the landscape through the incorporation of non-local materials sourced at these locales. Scarre (2004b: 147-149) has argued that this was the case for numerous Portuguese megaliths where slabs were frequently sourced off-site, usually from within a 5km radius, but occasionally more than 10 km from the site of construction. In Kintyre, south-west Scotland, the multi-phase Blasthill Clyde cairn incorporated a variety of different stone type derived from a number of locations, ranging from the immediate vicinity to about 2km distant (Cummings, 2012: 36-41). The utilization of transported materials from up to 32km away has been also been recorded at a number of long barrows in southern England (Piggott, 1962: 58; Donovan, 1977; Worssam, 1990: 229-230; Darvill, 2009b). Currently, the most impressive example of long-distance transport of construction materials in Britain is the bluestones' journey of over 200km from the Preseli Mountains (Pembrokeshire) of south-west Wales to Stonehenge (Wiltshire) in southern England (Darvill, 2009a, 2009b; Bevins, et al., 2014; Darvill and Wainwright, 2014a, 2014b; Parker Pearson, et al., 2015).

Undoubtedly the motivations behind the transport of construction materials over vast distances could have varied and particular locations could have been considered significant for a variety of reasons, which could have been situationally informed and quite culturally specific. For instance, Darvill and Wainwright (2014a: 24-25) argue that the bluestones were transported to Stonehenge because the location in which they originated was believed to have possessed healing properties, and that the stones themselves may have been been perceived as retaining this quality. In contrast, Brück (2004: 321-322) has argued that the incorporation of materials from three different sources within a 2.5km area (soil from the immediate vicinity, clay from c. 1.6km to the west and clay from c. 2.4km to the north) in the Early Bronze Age barrow C37 at Towthorpe (East Yorkshire) in north-east England, could be connected with identity and the representation of familial connections.

Regardless of the reasons for incorporating materials from various locations into a monument, it may be argued that in many instances the distances over which materials were transported could provide clues about the scale of the groups holding a vested interest in a monument's construction. In the Boyne Valley, the Newgrange 1 and Knowth 1 structures were both constructed from materials derived from a variety of locations including a combination of relatively local sources and distant upland and coastal areas. In fact, it appears that much of the material was transported along the coast and up the Boyne (Stout and Stout, 2008: 11).

In the case of Newgrange 1 (Figure 7.20), some greywacke for the passage and chamber orthostats, the roof corbels and kerbstones originated in outcrops found 3-5km to the north or east (Stout, 2002: 30; Tilley, 2008: 160), but the major source was probably Clogherhead c. 10km north of the mouth of the Boyne (Cooney, 2006: 702). Gaps in the passage roof were packed with a mixture of burnt soil from the adjacent area and sea sand derived 20km downstream at the mouth of the Boyne (O'Kelly, 1982: 101). The pebbles in the cairn were derived from the lower riverine terrace, immediately north of the Boyne, possibly 750m north of the monument (*ibid*.), whilst the mound itself was composed of local boulder clay and sods from nearby fields (Stout, 2002: 31). The granite for the basins was probably from the Mourne Mountains 50km or more to the north (Tilley, 2008: 160). Five types of non-local cobbles were used to embellish the façade and entrance area. The white quartz came from the Wicklow Mountains 50km to the south (Mitchell, 1992: 129; Meighan, et al., 2003), whilst the cobbles of granodiorite, (micro)granite, banded siltstone and gabbro came from north-east Ireland (Newry, Mourne Mountains, Slieve Gullion and Carlingford Mountains). Of these, the siltstone cobbles were derived from the shoreline of the Carlingford Mountains and the gabbro specimens were probably collected on

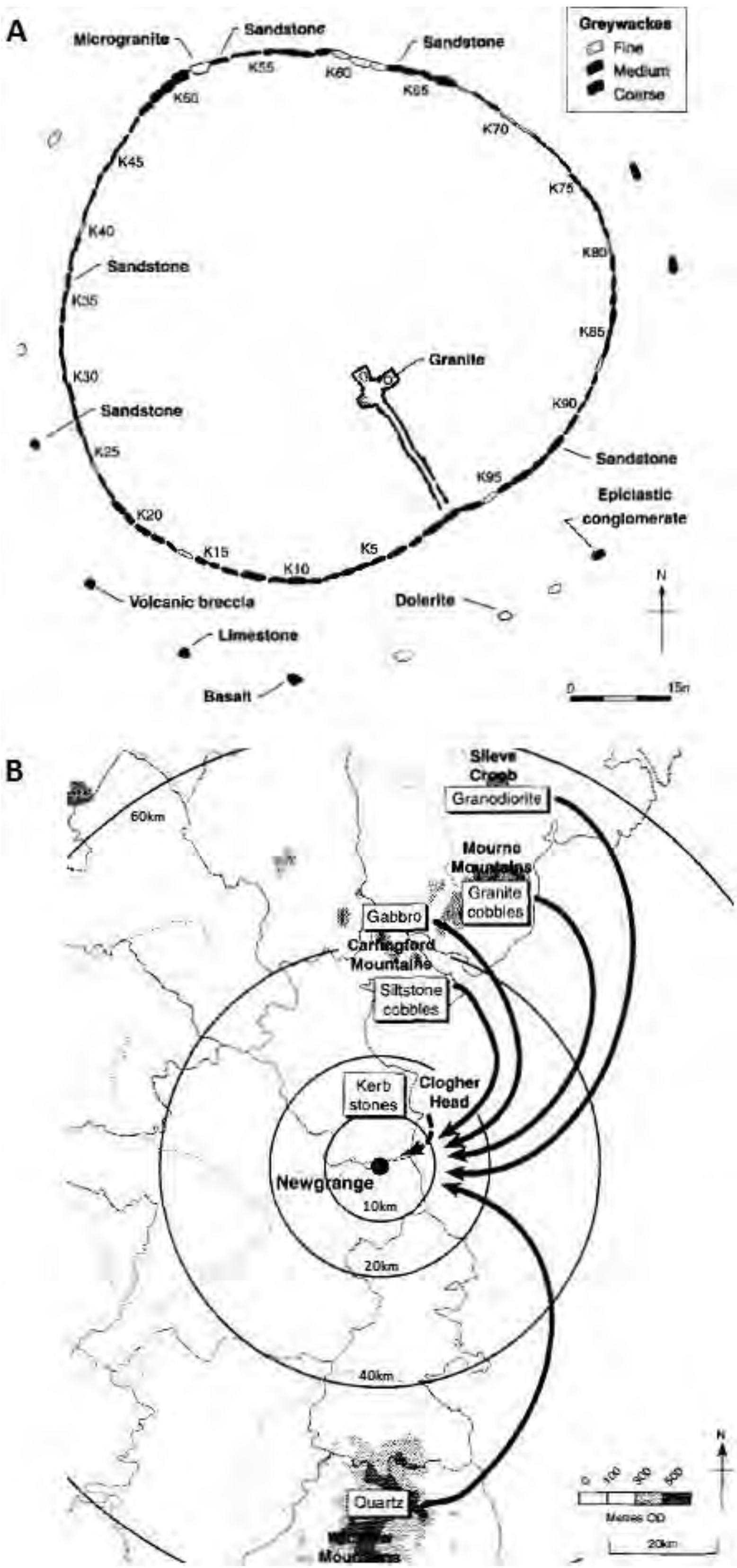


Figure 7.19: Newgrange building materials as indicators of shared identity. (A) The stone types used in the construction of Newgrange. They used mostly greywacke quarried from Clogher Head, north of the Boyne Valley. The other stones were glacial erratics which would have been found locally. A great variety of stones were used in the Great Stone Circle and it is unlikely to have been constructed of stones from the tomb (Stout and Stout, 2008: Fig. 6.); (B) Location of the stone sources utilized for the construction of Newgrange with distances indicated with 20, 40 and 60km radius circles (Stout and Stout, 2008: Fig. 4.)

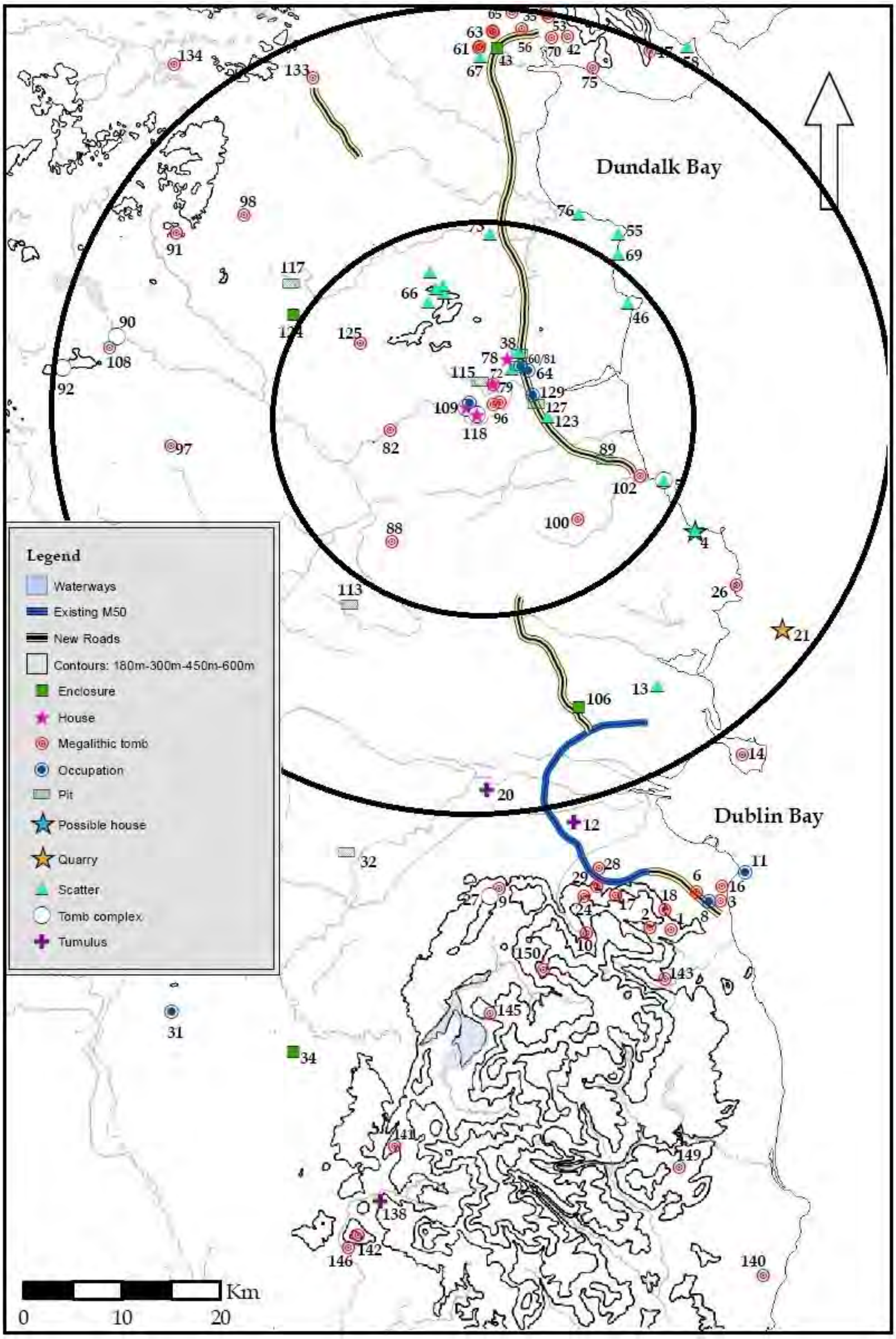


Figure 7.20: Distribution of Middle Neolithic sites in eastern Ireland (Smyth, 2007: Fig. 8.4. with additions). Additions: 20 and 40km radius circles have been added by the current author using the 20km scale as a guide. Note that the sites around the Louth/Down border to the north of Newgrange are encompassed within the 40km circle, while it only reaches a little further than the Meath/Dublin border to the south.

Rathcor beach in Dundalk Bay Co. Louth, c. 40km north of Newgrange (Mitchell, 1992: 135, 145; Meighan, et al., 2002).

The Knowth 1 structure includes blocks of greywacke, sandstone and limestone. The greywacke was obtained from the outcrops located 2-6km to the north or east and/or from Clogherhead. The limestone was probably obtained 1-2km to the north or from local outcrops to the east and the sandstone within the immediate vicinity (Stout, 2002: 30; Cooney, 2006: 702; Tilley, 2008: 160). Again, the covering mound was of local boulder clay and sods from nearby fields (Stout, 2002: 31). The tumulus façade and tomb entrance areas were also adorned with cobbles of quartz, granodiorite and banded siltstone (Eogan, 1986: 47; Jones, 1999: 339; Cooney, 2006: 702-703) which were acquired from the same sources as their Newgrange counterparts. The white quartz was from the Wicklow Mountains 50km to the south (Mitchell, 1992: 129; Meighan, et al., 2003), the granodiorite from the Newry igneous complex and the banded siltstone from the shoreline of the Carlingford Mountains, both located more than 50km to the north (Mitchell, 1992: 135; Meighan, et al., 2002).

Based upon the materials utilized in the Newgrange 1 and Knowth 1 structures it may be advanced that alliances encompassing large social units existed and that these encompassed a core area spreading concentrically for at least c. 20km around the Boyne Valley and upriver/downriver, and involved longer-distance northward connections stretching to the areas accessible from Dundalk Bay and Carlingford Lough (Figure 7.19). The date and nature of the 'quartz façade/platform' may have some implications for the interpretation of alliances or shared group identity between communities based around the Boyne Valley and those located to the south. If the quartz was originally part of a buttress or wall then it is feasible to suggest that the monument could have been 'remodelled' or symbolically 'destroyed' during the later Beaker phase or Early Bronze Age prior to or at the same time as the erection of the stone circle. However, if the quartz layer was a platform of Chalcolithic origin then the only Neolithic quartz incorporated into the structure of Newgrange 1 was that associated with the roof-box (O'Kelly, 1982: 96; Lewis-Williams and Pearce, 2005: 229; Stout and Stout, 2008: 49) and the low oval setting and platform outside the entrance (O'Kelly, 1973: 140-141, 1982: 76). Furthermore, it would strongly suggest that based upon the material incorporated into the passage tomb the connections outside the Boyne Valley could have been stronger to the north (Figure 7.20) and that connections to the south, may not be as materially overt, or notably significant, until the Chalcolithic period. However, affiliations to the south undoubtedly existed during the earlier Neolithic and it would be naive to suggest otherwise, but it is unclear whether any significant shared group identity with the Boyne Valley-associated communities would have stretched as far south as the Dublin/Wicklow Mountains.

7.13 WAS THE ART COMPREHENSIBLE TO THE MANY OR JUST A FEW?

Overt suggestions that passage tomb art represents a medium of exclusivity, political subjugation and ceremonial power have been proposed by numerous researchers (e.g. Lewis-Williams and Dowson, 1993: 55, 59-63; Lewis-Williams and Pearce, 2005: 200-202, 216, 221). It's frequently argued that the meaning of the art would have been restricted to an "elite" minority who sought to retain political and ceremonial control. It must be borne in mind that life expectancy in the Neolithic would have afforded limited years to accumulate and transmit knowledge and in terms of generational turnover the transfer of carving skills and sacred knowledge would have been relatively high. It is also clear that artists of varying skill were involved in its production (Cooney, 2000: 87; Hensey, 2010: 185-186; 2012: 171-172). Moreover, centralized religious authority is more typically connected with the emergence of city-state political organization (Winkelman, 1986b, 2007; see also Wilson, 2013: 77-103). Thus, we should perhaps ask ourselves whether communities, as congregation(s), were "acquainted" with a belief system that we now consider (or recognize) to have been pervasive and infused with not only communal and cyclical practices, but also the daily life of individuals and families (e.g. Bradly, 2005). Furthermore, communities were intensely involved in the construction of monuments and suggestions that people were passive players, somehow 'duped' by ruling elites should perhaps be reconsidered (Hensey, 2010: 280). Notwithstanding, to expand upon a statement made by O'Sullivan (2006: 668), as was the case with Early Christian iconography, it is probable that a deep knowledge of the art and associated beliefs would have been essential, if not an obligation for Neolithic magico-religious and ceremonial specialists who would have been in a position to read more into symbols than others. Although symbolism, in the social and mythological sense, is a complex, multi-layered and deeply abstract phenomenon (*ibid*.), it's notable that the art on Irish Early Christian high crosses was understandable, although perhaps without some finer nuances, to the general population and it is feasible that Neolithic art communicated aspects of ideology in a similar fashion (Stout and Stout, 2008: 18).

7.13.1 Altered States of Consciousness

A neuropsychological theory that has been applied to prehistoric European art in recent decades is that it represents 'entoptic imagery' derived from subjective visions experienced through 'altered states of consciousness'. Altered states of consciousness (ASCs) describe every mental state that differs from baseline or normal woken state (Ludwig, 1966). Although culturally and subjectively mediated, there a series of common ASC experiences (Table 7.8) (Ludwig, 1966: 227-230; Winkelman, 1986a: 175).

Common ASC experiences
alterations in thinking
changes in senses of time and body image
loss of control
change in emotional expression
perceptual distortion change in meaning and significance
a sense of ineffability
feelings of rejuvenation
hyper-suggestibility

Table 7.8: Common ASC experiences

Entoptic imagery denotes the visual phenomena experienced by those engaged in altered states of consciousness. These images are presumed to be universal (Reichel-Dolmatoff, 1978; Lewis-Williams & Dowson 1988, 1993; Lewis-Williams 2001, 2002, 2004) and are generally multi-coloured geometric or abstract shapes that are perceived when the eyes are closed, although they can occur as external hallucinations (Hodgson 2000: 870). Dronfield (1996a: 373-374), prefers an alternative term 'subjective visual phenomena' which he suggests encompasses all entoptic, enthophalmic, phosphene and hallucinatory visual experience. This model argues that individuals experiencing deepening altered states of consciousness often pass through three stages, from geometric patterns (Stage 1), to iconic forms (Stage 2) to complex scenes of animals and self-transformations (Stage 3). The model also stipulates that the three stages need not necessarily be experienced sequentially, nor each stage individually experienced. Lewis-Williams and Pearce (2005: 48-54) and Dronfield (1996a: fig 6, 1996a: 37-39) list a series of images and associated phenomena they consider 'typical' for each stage, which are summarized in Table 7.9. Altered states of consciousness may be induced by numerous means including: (1) ingestion of psychotropic substances (endogenousopiates, endogenousopiates), (2) alcohol, (3) sleep and dream states (hypnagogia), (4) near-death experiences, (5) electrical stimulation, (6) flickering light, (7) fasting and nutritional deficits, sexual restrictions, (8) social isolation and sensory deprivation, (9) meditation, auditory-driving (e.g., chanting, clapping, drumming), (10) extensive motor behaviour (intense rhythmic dancing), (11) extreme exertion and physical stress, (12) fatigue, (13) migraine, (14) temporal lobe epilepsy, schizophrenia and other pathological conditions (see Winkelman, 1986a, 2011; Dronfield, 1995a, 1995b, 1996a, 1996b for discussion of induction techniques).

The idea that passage tomb art represents entoptic imagery has been advanced (Bradley, 1989; Lewis-Williams and Dowson, 1993; Dronfield, 1995a; 1995b; 1996a; 1996b; Lewis-Williams and Pearce, 2005) and critiqued (Dronfield 1996b and responses; Shee Twohig, 2000: 91; Helvenston

<table>
<tr><th colspan="2">Altered States of Consciousness</th></tr>
<tr><th colspan="2">Stage 1</th></tr>
<tr><td colspan="2">Images may appear in combinations; may rotate, expand, contract, combine and change one into another; may also be projected onto real images when the eyes are open</td></tr>
<tr><td>Lewis-Williams and Pearce List</td><td>Dronfield List</td></tr>
<tr><td>(1) a grid and its development into a lattice or expanding hexagon pattern;

(2) sets of parallel lines;

(3) bright dots and short flecks;

(4) angular/undulating zigzag lines;

(5) nested catenary curves (fortification), the outer arc of which comprises flickering zigzags;

(6) filigrees, or thin meandering lines;

(7) spirals</td><td>(1) the meander, which is irregular, steeply curved, and often turns back on itself, unlike the shallow, more regular sine-wave type
[possibly similar to Lewis-Williams and Pearce (4)];

(2), the fortification
[corresponds to Lewis-Williams and Pearce (5)];

(3), the arc spiral;

(4), the filigree
[corresponds to Lewis-Williams and Pearce (6)];

(5) the loop arc, a subtype characterised by turning back upon its terminals and completing a looped pair of concentric arcs;

(6) the multiple spiral
[corresponds to Lewis-Williams and Pearce (7)];

(7) the small arc, a pattern isolated from the generic type of "dot" or "blob"
[possibly similar to Lewis-Williams and Pearce (3)]

* Dronfield did not include parallel lines or grid/lattice on his list, but discussed the latter motif in the context of trance in 1996b</td></tr>
<tr><th colspan="2">Stage 2</th></tr>
<tr><td colspan="2">Individuals try to make sense of the entoptic forms and construe them as objects with emotional or religious significance</td></tr>
<tr><td colspan="2">As individuals move towards stage 3 they often experience a vortex or tunnel, at the end of which is bright light. On the internal surface of the vortex there is sometimes a grid, in the compartments of which appear the first iconic images of people, animals, monsters etc.</td></tr>
<tr><th colspan="2">Stage 3</th></tr>
<tr><td colspan="2">upon emerging from the vortex, subjects enter a true hallucinatory state which may include</td></tr>
<tr><td colspan="2">(1) aural hallucinations;

(2) somatic hallucinations (such as attenuation of limbs and bodies);

(3) intense awareness of one's body;

(4) polymelia (the sensation of having extra digits and limbs);

(5) zoopsia (seeing animals);

(6) changing into animals and other transformations.

A feature of some stage 3 experiences is that the entoptic forms of stage 1 persist, peripherally or integrated with iconic hallucinations.</td></tr>
</table>

Table 7.9: Stages altered states of consciousness

and Bahn, 2002, 2004; Helvenston, et al., 2003; Evans, 2004: 47). It is not possible to discuss this debate at length, but one issue that has been raised is that it would not have been possible for people in altered states of consciousness to produce the carvings (O'Sullivan 1996a: 94, 1996b). Hensey (2010: 177-178) suggested altered states could have been a first step in producing artistic compositions applied at a later point in time. Lewis-Williams (2012: 24) maintains that where entoptic phenomena feature among the motifs of an artistic repertoire altered states are likely to have played a role in its creation, but he concedes that the images were unlikely to have been made by people whilst experiencing altered states.

Another issue is that the application of these ideas does not consider the chronology of the artistic 'styles' (see Hensey, 2010: 178-181 for discussion). In an attempt to rectify this shortcoming, Hensey (*ibid*.) has proposed that some of the "disorganized" stage 1 art could represent recordings of subjective vision, and in stage 2 there may have been instances when a basic range of abstract motifs were part of a 'cultural' repertoire, but the carvings were not inspired by trance experiences. The later stage 3 and 4 art does not contain diagnostically entoptic motifs. It is possible that some of the stage 4 "pick-dressing", which could have been produced for a variety of reasons (see Cochrane, 2009 for discussion), could have had a relationship with ASCs. The current author does not believe that there is necessarily a strong link between the origins and development of megalithic art and altered states of consciousness. However, following Hensey (2010: 178-181), it is conceivable that a 'cultural' repertoire existed and among the range of abstract motifs utilized, a number were derived from altered states of consciousness. Furthermore, as the motifs could have held a degree of multivalency, it is feasible that such motifs could have retained connotations associated with movement between states of consciousness and/or plains of existence within the context of a three-tiered cosmology. In addition, altered states of consciousness have had strong links with religious experience historically (e.g. Winkelman, 1986a, 1986b, 2007; Ustinova, 1998, 2009, 2011: 51-68; Geels, 2011) and as such the neuropsychological model could be a useful tool in this context, even if trance experiences were not closely connected with art production.

7.13.2 Passage Tombs and the Living

There were undoubtedly occasions, such as the turning points of the year, when limited number of individuals entered monuments. In addition it has been advanced that individuals or small groups of people spent time within some passage tombs for the purpose of viewing astronomical events over extended periods (Prendergast, 2009: 86, 2010, 2012: 60; Hensey, 2014: 9) and that "rites of seclusion" (Hensey type B) may have been a widespread and integral aspect of initiation processes (Hensey, 2010: 273-293). There have also been suggestions in the past that the Newgrange roof-box represented some form of interactive oracle or communicative device (Lynch, 1973: 152; Sheridan 1985/86: 28). While not agreeing with this interpretation, it is feasible that certain individuals who entered or spent time in passage tombs could have been magico-religious practitioners with oracular functions (see Winkelman, 1986a, 1986b, 2007, 2010, 2011 for outline of different forms of religious practitioner; see Cochrane, 2006: 35-39 and Sidky, 2010 for recent discussion of the role of shamanism in religiosity). Although it is not possible to elaborate on this idea in the current text, it may at least be advanced that one possible alternative function for stone basins and clay/stone balls, in conjunction with other materials such as animal and human bones, could have been divination and other oracular engagements (e.g. see Gilead, 2002; Dickie, 2007; Greaves, 2012; Smith and Leon, 2014 for recent discussions of ancient Greek and Near/Middle Eastern divination).

7.13.3 After-Death Communications

In ancient Greece there were practices intended to evoke contacts with deceased individuals, deities and spirits (Ustinova, 2011). Specialist practitioners engaged in elaborate and time-consuming procedures, which included seclusion, cold baths, prayers, special diet, sexual abstinence, music and dance, to achieve ASCs and make such contacts (Hastings, 1991; Ustinova, 2011, 67). In a society where contacts with the dead were believed, however, they may also be 'made' by non-specialists given the right conditions. As such, it is feasible that passage tombs could have been utilized for "after-death communications" by not only 'specialists' but more widely within communities by bereaved individuals. In general terms "After-Death Communications" (ADCs) although sometimes perceived as a form of "ghost encounter", are more appropriately defined as "sense of presence experiences" (Kwilecki, 2011; Steffen and Coyle, 2012). These experiences involve bereaved and grieving individuals "receiving messages" from deceased individuals, which range from physical sensations to more cerebral experiences (Whitney, 1992; Klugman, 2006; Hastings, 2012: 2). As such, bereaved individuals may "perceive contact" through various phenomena (Table 7.10) (Klugman, 2006; Kwilecki, 2011: 219-220; Hastings, 2012: 2).

Sense of Presence Experiences
feeling a presence
visual images
sounds, including voices
having conversations
odors
dreams
"meaningfully timed" appearances of animals, rainbows, and other symbolic natural phenomena

Table 7.10: Sense of presence experiences

Numerous psychological, medical and related studies (e.g. Kalish and Reynolds 1973; Haraldsson, 1988; Lindstrom, 1995; Klass, 1996; Klass, et al., 1996; Grimby, 1998; Klass & Goss, 1999; Bennett and Bennett, 2000; Tobert, 2001; Chan, et al., 2005; Field, et al., 2005; Goss and Klass, 2005;

Klugman, 2006) indicate the cross-cultural prevalence of the “sensing of presence” concept and apparent communications after death are a worldwide phenomenon occurring across historical periods. However, these phenomena can be conceptualised in diverse ways depending on the socio-cultural context in which they occur (Klass and Walter, 2001; Steffen and Coyle, 2012). According to attachment and social bond theories (Field, et al., 2005; Klass, 2006), ADC type experiences are normal in the immediate aftermath of a death, as adjustment lies in the mourner’s continuation of a relationship with the deceased (Kwilecki, 2011: 221, and references), but the time elapsed since a death does not affect the ADC experiences occurring (Hastings, 2012: 8-9, 17-18). In terms of coping with bereavement ADCs have a number of benefits (Table 7.11) (Field, et al., 2005; Kwilecki, 2011: 238-241; Hastings, 2012: 16-17). The impact of ADCs as religious reinforcements varies with tradition. But while considering the possible role of ADCs in prehistoric societies, it is notable that when socio-religious conceptual frameworks legitimize ADCs, conversation *with* deceased members of a community facilitates their re-construction as honoured ancestors (Walter, 1996; Klass and Walter, 2001) and where the dead hold prominent cosmological roles or positions, ADC experiences tend to validate faith comparatively forcefully. They can also facilitate conversion to a (religious) faith, as they are commonly construed as evidence of a previously unacknowledged supernatural order (Kwilecki, 2011: 238-241, and references).

Benefits of ADC Experiences
(a) provide instantaneous pain relief
(b) reduce feelings of distress
(c) reinforce comforting religious belief
(d) enable continuing bonds with the deceased beyond the initial stages of bereavement
(e) introduce the possibility of constant, ongoing contact outside “ritual” (or spiritualized) settings

Table 7.11: Benefits of ADC experiences

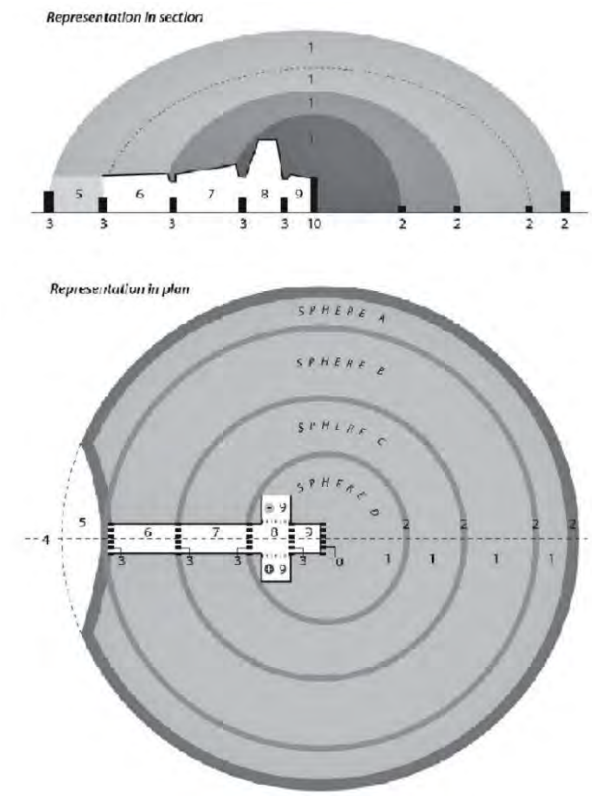
To date, only a limited amount of research has been undertaken into techniques for evoking ADC imagery in restricted sensory environments (Hood and Morris, 1981; Terhune and Smith, 2006, Merz, 2010) and (at present) there has only been one study utilizing a psychomanteum booth (a dimly lit booth containing a chair and a mirror angled to reflect darkness) based on the oracular grottos of ancient Greece (see Addey, 2007; Ustinova, 2011), which involved the explicit objective of eliciting contact with the deceased (Hastings 2012). These studies (Hood and Morris, 1981; Terhune and Smith, 2006; Hastings 2012) indicate that it is possible to evoke ADC experiences in a relatively short space of time though appropriate preparation involving evocative imagery, the presence of objects associated with the deceased and the communication of memories, feelings, and intentions for the process. Furthermore, participants in the Hastings (2012) study spent only 45 minutes alone in the booth (63 of 100 reported contact with the deceased). Hastings (*ibid.*) reported that the "preparation" and "conditions of the booth" appeared to facilitate apparent dialogues with the deceased and that reported experiences included (among others; see Table 7.12) perceived alterations of time and spontaneous imagery for the vast majority of participants, and shifts in bodily sensations (see Merz, 2010 for examples of other phenomena experienced). Some of the imagery reported can be recognized as "hypnagogic", which are the spontaneous images that occur as a person is moving into the first stage of sleep (see Winkelman, 1986a: 180, 2011: 171-172; Lewis-Williams and Pearce, 2005: 44-45 for discussion of hypnagogia), which are not interactive , tend to be brief, and may be realistic or abstracted. These are mostly visual (with occasional auditory and tactile features) and can include faces, buildings, objects, and animals, to elaborate and fantastical landscapes (Hastings, 2012: 18, and references).

Experiences Reported in Hastings (2012) Study		
Visual sensory experiences	**Other Sensory experiences**	**Communication events**
streams and patterns of light tunnels grids streams & spirals of coloured light changes in illumination animals the starry sky visual memories "drop-ins" by deceased beings "angels", "spirit guides", "Jesus"	Physical sensations of energy intense internal body energy "warmth of the heart" touches odors	mental conversations speaking aloud hearing a voice ''extrasensory perception'' Memories questions and answers messages (advice, guidance)

Table 7.12: Sensory experiences reported in Hastings (2012) study

7.13.4 Passage Tombs and ADC experiences?

As outlined above, the utilization of preparatory instructions, the manipulation of expectations and the orchestration of the preparation experience can help to produce ADC experiences in relatively short periods of time. Thomas (1993: 89, 91) highlighted the fact that moving from the outside world to the chambers of passage tombs was choreographed by their architecture. At Dowth, Knowth 1 and Newgrange 1 there is a generalized pattern where the outside of the monuments are predominantly decorated with curvilinear motifs, but the interiors with mostly angular designs (O'Kelly, 1982: 146-149; O'Kelly and O'Kelly, 1983; Eogan, 1986: 146-195; Bradley, 1989: 73, 1995: 116; 1997: 124; Shee Twohig, 2000) and architectural devices constrain the way in which the tombs, symbols and compositions would have been encountered and experienced (Eogan, 1986: 181; Thomas, 1990, 1992, 1993; Shee Twohig, 1996, 2000: 93; Stout and Stout, 2008: 28-40). A series of architectural (sillstones, lintels, jambstones) and graphical (chevrons, scalariforms/ramiforms) thresholds had to be negotiated along the passages before reaching the cells or recesses of the chamber where 'threshold signs', exclusive iconography and unique



	Material elements	Symbolic reading
1	Tumulus layers	Concentric spaces
2	Enclosures	Invisible limits
3	Thresholds	Visible limits
4	Axis	Pathway
5	Forecourt	First compartment
6	Passage	Second compartment
7	Antechamber	Third compartment
8	Chamber	Fourth compartment
9	Cells /recesses	Final compartments
10	Backstone/ground	Ultimate doorway

Figure 7.21: Model of an ideal passage tomb with representation of the spatial structures and symbolic systems (Robin, 2010: Fig. 29.)

paraphernalia (e.g. basin stones) are located (Figure 7.21; Robin, 2010: 147-150, 2012: 412). For example, parallel chevron motifs are associated with architectural limits in the eastern tomb of Knowth 1 (Eogan and Aboud, 1990: 122-124; Robin, 2012: 387) and the last orthostat in the left wall of the passage (L22 and L8 respectively) in Newgrange 1, where opposed triangles occur exclusively inside the three cell recesses (O'Kelly 1982, fig. 41; Robin, 2012: 389, 392).

If it was widely believed that the dead were contactable in Neolithic Ireland then individual expectations would have been that ADCs were achievable. Preparation could have involved consultation of magico-religious practitioners, but this may not have been necessary, if as suggested passage tomb architecture and art recognisably referenced a three-tiered cosmology, the solar journeys, and entoptic phenomena, and/or were indicative of crossing thresholds. The occurrence of particular motifs and architectural elements at critical junctures would have elicited particular responses by evoking meaning and connotations (Shee Twohig 1981: 139; Eogan 1986: 183; Thomas, 1993: 89, 91), thus manipulating expectations. As has been noted elsewhere (e.g. Bradley, 1989, 2009; Lewis-Williams and Pearce, 2005) the passages and particularly the chambers would have been particularly conducive to initiating sensory deprivation and triggering altered states of consciousness. For example, sunlight only reaches the chamber of Newgrange 1 around the winter solstice (Patrick, 1974; O'Kelly, 1982: 21, 124; O'Brien, 1988; Ray, 1989), the

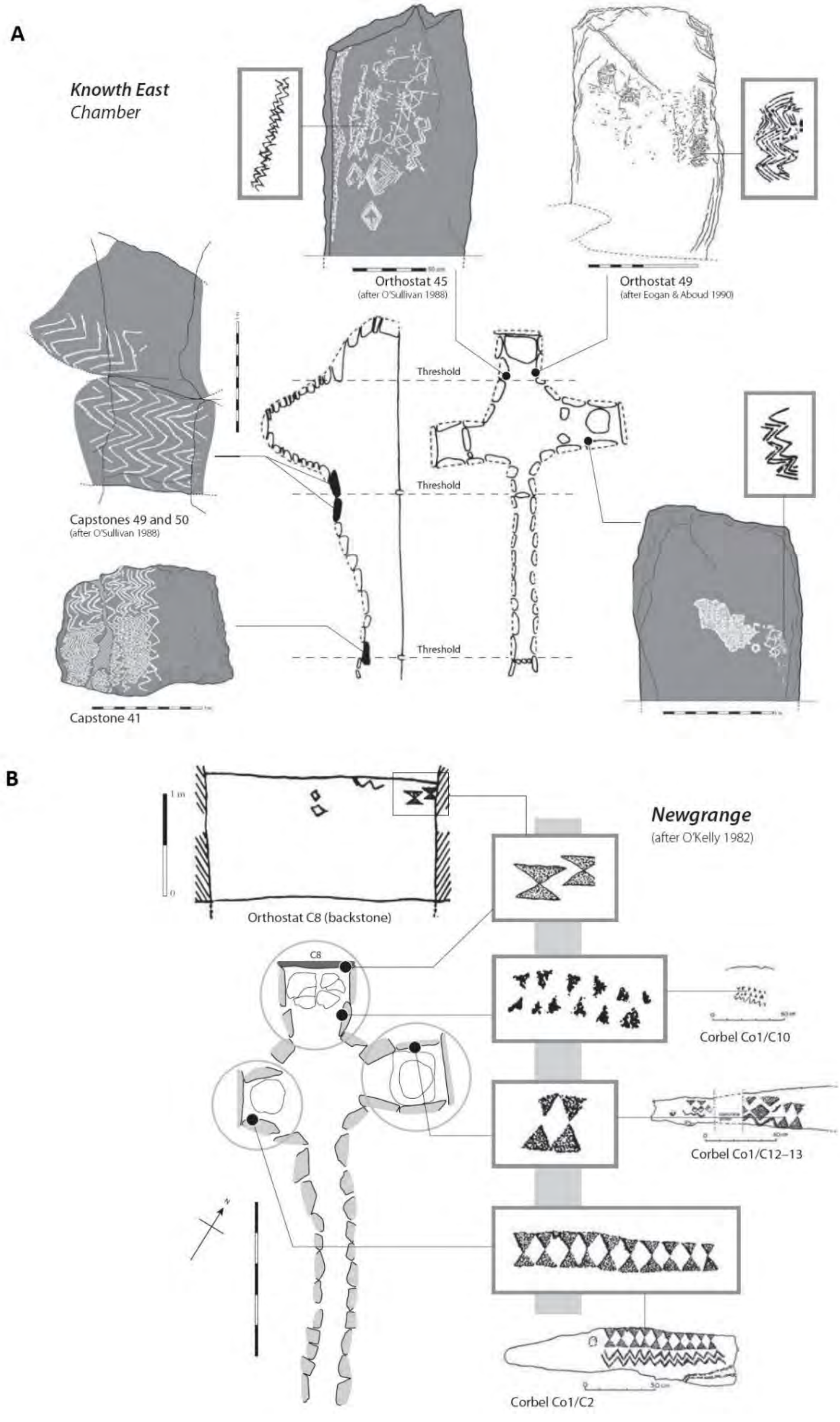


Figure 7.22: Distributions of parallel chevrons and opposed triangles. (A) Knowth East showing the correspondence between the location of the parallel chevrons motifs and the internal partitions of the tomb (Robin, 2010: Fig. 10.); (B) Newgrange showing the distribution of the opposed triangles motif (Robin, 2010: Fig. 15.)

chambers of Knowth 1 (particularly in its final form) would have remained in perpetual darkness (Brennan, 1994: 107; Bradley, 2009: 74), and the "annexe" leading away from the western recess of the chamber in Dowth North would presumably have been similarly dark (O' Kelly and O' Kelly: 1983: 153-154). Lamps or torches would have been a necessity to see the art and in terms of inducing ADC experiences they would have been useful, as they would have caused motifs to 'come to life and dance' (Cochrane, 2008: 166-170) adding to the immersive experience.

In addition, in the Hastings (2012) experiments a low light and a mirror were employed. In this context it is particularly notable that Hensey (2010: 240-248, 251) suggested that stone basins may have been symbolically associated with water and that specimens such as those from Newgrange 1 and the particularly ornate example from the eastern tomb of Knowth 1, may have held water. If this was the case, art located on the roofstones (and walls) could have been reflected in the basin stones. A further element which could have assisted in achieving ADC experiences would have been the physical presence of the dead and grave goods within the monuments, items possibly associated with people in life. It is also feasible that people could have brought items connected with a deceased friend or relative with them into a tomb to enhance feelings of connection. Arguably passage tombs would have been extremely conducive to facilitating relatively easily induced ADC experiences for non-specialists over short periods.

Experiencing ADCs would have allowed people to maintain, even strengthen, connections with those that passed away. Such feelings of connection could have been a fundamental part of the continued regeneration of communal bonds and group identities. A combination of anthropological and neuro-phenomological research indicates that 'portaling', the experience of passing through a doorway, tunnel, aperture, hole, etc., and moving from one reality to another, or onto different plains of consciousness, is a cross-cultural phenomenon identifiable in both ancient and modern societies. In fact, evidence suggests that the human mind encourages the experience of transformation and world-shifting, particularly during activities which cause alterations of consciousness (MacDonald, et al., 1989; Doran, 2004: 28-29), so perhaps passage tombs should be viewed as elaborate doorways which facilitated 'travel' between different realms and tiers of the cosmos.

7.14 Conclusion

It has been adanced that the Boyne Valley was a significant liminal area combining heights and waters and, as argued, conveyed connections with the three-tier division of the cosmos.

Architectural symbolic representation of three-tier cosmology also appears to have been incorporated into the large monuments at Knowth, Newgrange and Dowth, as they incorporated a system of concentric spaces and a series of axial emphases. These spatial divisions were marked by a combination of architectural and iconographic thresholds within the chambers and the passages which physically and symbolically connect the outside world to the centre of the mound. The structural utilization of quartz may allude to a combination of the solar journeys, sun and sunlight, Milky Way/rainbow symbolism, and perhaps related themes of water, renewal, re-birth, while other architectural features and material culture may also allude to 'fertility'. The structure and layout of these megaliths, irrespective of individual orientations, may also have referenced a 'cosmological ideal' connected with the solar journey, with the entrance symbolically located at 'sunrise' and the rear/backstone at 'sunset' and movement towards the chamber could have symbolized sun-wise directionality. A preference for the right-hand side has been identified in architecture, art and depositional practices. This pattern may have made symbolic reference to sun-wise directionality and if the backstone/rear of the chamber also symbolized 'south', the right side would have a symbolic connection with 'sunset' and the left side with 'sunrise'.

In the repertoires of megalithic art found in the Boyne Valley, references to the solar journey and three-tier concepts are evident in such motifs as 'sun-dials', 'solar symbols', 'boats', 'arboriforms' and 'serpentiforms'. Spatial analysis has demonstrated that motifs were not placed randomly, but were distributed at recurring architectural locations within and around monuments, most notably at 'threshold' points. Communities must have had an understanding of their belief systems and cannot have been ignorant of the significance or substance of symbolic representations and megalithic art must have communicated at least aspects of ideology. It has been argued that the distribution of motifs in addition to the utilization of water-filled stone basins, could indicate that one function of these sites was to facilitate engagement in ADCs by non-specialists.

The Knowth alignments and potentially Dowth North may be connected to the turning points of the economic calendar and the beginning of the "ceremonial or religious year" with the Newgrange and Dowth South alignments. The 'imprecise' Dowth South alignment could also have marked the end and/or beginning of particular activities connected with the "economic calendar" or the "darkest portion" of the year. These orientations appear to also reflect the mythology of the solar journeys, with Knowth and Newgrange marking the nine month period from the conception to the birth of the sun and the combination of Newgrange and Dowth marking the daily journey at mid-winter. It has also been advanced that movement between Newgrange and Dowth over the course of a day may have symbolically referenced sun-wise directionality also, but there may have been ‘reversals’ where the direction travelled at a particular time of day opposed the direction the sun itself was travelling.

Cosmology, geography and ‘ritual’ appear to have been intimately linked at Brú na Bóinne. This can be seen at the scale of the individual monument and at that of the complex, but also much more widely in the shared aspects of Eurasian cosmology. Geography, ‘ritual’ and cosmology would have acted together at these different scales in the creation of identities. The evidence and arguments presented so far allow us to begin to perceive aspects of later Neolithic identity in eastern Ireland. Identity does not, however, appear to have been static. In the next chapter, the symbolism and possible changing identities associated with the international Beaker complex will be explored.

8 THE BEAKER COMPLEX, ARCHERY SYMBOLISM AND CHANGING IDENTITIES

8.1 INTRODUCTION

In the following chapter current understandings regarding the emergence, spread and nature of the European Chalcolithic Beaker 'complex' will be reviewed. It will be argued that the Beaker phenomenon represents a 'superordinate identity' ingrained with cosmological, mythological and potentially 'theological' connotations. 'Archery symbolism' is regarded as an essential component of the Beaker 'package' and it is frequently suggested to infer the existence of 'warrior' ideology. An alternative explanation for Archery 'symbolism', centring upon a concept of "cultic" association, will be explored. The implications of the arrival of the Beaker phenomenon in Ireland and the implications for identities associated with the Boyne Valley will also be addressed.

8.2 ORIGIN OF THE BEAKER COMPLEX: CURRENT UNDERSTANDING

During the first half of the 3rd millennium BC, from the Urals to the Atlantic, Europe became enveloped by three similarly structured and arguably interrelated 'cultural' phenomena in the form of the Corded Ware/Globular Amphora/Single Grave/Battle Axe cultures, the Yamnaya and the Beaker complex (Heyd, 2012: 99-101, 104). The current distribution of the Beaker 'phenomenon' reaches from Ireland in the west to Poland and Moravia in the east and from North Africa to the south to Norway and possibly as far north as the Arctic Circle (Figure 8.1). Geographically the "culture" follows the Atlantic and Mediterranean coasts and the main river systems and the overall distribution is sub-divided into Atlantic, Mediterranean, Central European/ Eastern and Northern domains (see e.g. Heyd, 2012: 99-101; Van de Noort, 2012: 63-64). Dating evidence from across Europe (Czebreszuk, and Müller, 2001; Müller and Van Willigen, 2001; Czebreszuk, 2003a; Liversage, 2003; Lemercier, 2004; Vandkilde, 2005, 2007; Sheridan, 2007; Prieto-MartÍnez, 2008; Piguet and Besse, 2009; Burrow, 2012; Desideri, et al., 2012; Healy, 2012; Heyd, 2012: 99-101; Prescott, 2012; Roberts and Frieman, 2012; Lanting, 2013; De Reu, 2014; Wencel, 2015) indicates that Beaker customs and material culture encompased the extent of its known distribution c. 2450-2350 BC.

At present, the initial emergence of Beaker pottery and the associated complex remains somewhat inconclusive. However, based upon available evidence, an Iberian origin is currently supported by most specialists, although there are those who question (e.g. Vander Linden, 2012) or refute (e.g. Jeunesse, 2015a) this model. Central Portugal has produced the largest

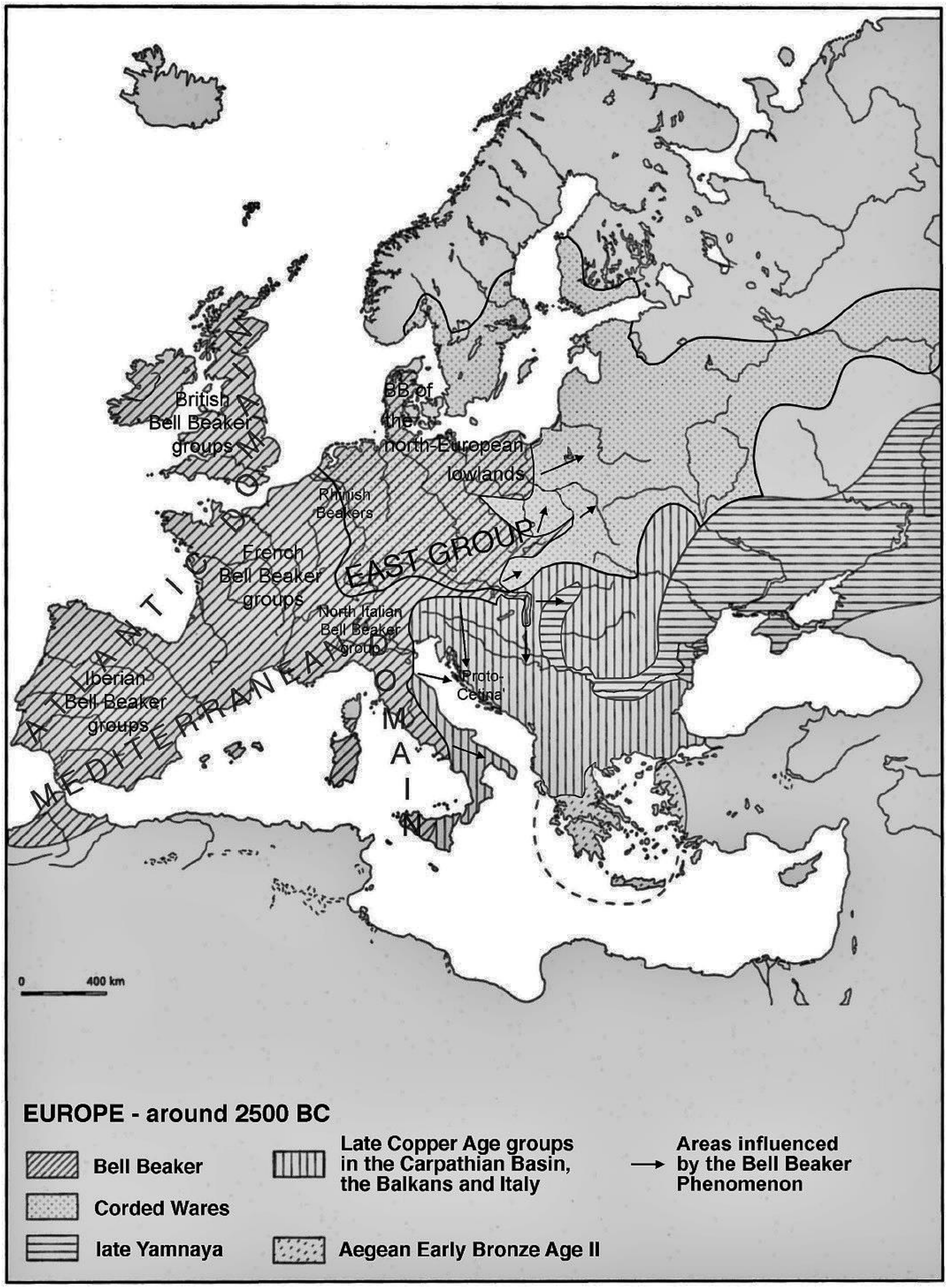


Figure 8.1: Distribution of the Bell Beaker Phenomenon in Europe; with regional groups, peripheries and some sites in the margins (Heyd, 2012: Fig. 7.1.)

concentration of Beaker finds in Europe to date (Case, 2004a: 13; Kunst, 2005; Salanova, 2005; Garrido Pena, 2014: 114), the earliest radiocarbon dates (c. 2700-2600 BC) (Cardoso and Soares, 1990/1992; Cardoso, 2001, 2004, 2014; Kunst, 2005), and appears to have been extremely important in terms of the origin and diffusion of the “phenomenon”. It should however be noted that the early dates from the Tagus River estuary (c. 2600-2500 BC) do in fact have parallels in north and south Portugal and parts of Spain (Cardoso, 2014). Notwithstanding, it is clear that during the 2nd quarter of the 3rd millennium BC (small to medium) maritime Beakers (dotted decorations) and (medium to large) AOO (all over ornament) incised vessels were contemporary and generally occur together in the Tagus area and throughout southern Portugal and the few sites recorded in northern regions (*ibid*.). The ‘observable’ diffusion of both these decorative styles and repertoires (including the most common AOO motifs, the "herringbone" and the "linear" variants), has been recognized along the western Atlantic façade with two main hubs in the Lower Estremadura area (the estuaries of the Tagus and the Sado) and Brittany, north-west France (Salanova, 2000, 2005; Case, 2004a: 13-22; Cardoso, 2004: 151-153; Needham, 2005: 177; Heyd, 2012: 99). However, the area where the Beaker styles first originated has yet to be determined.

As suggested by Turek (2012: 195-196; see also Vander Linden, 2012: 76-80), it is possible that the Beaker pottery styles didn’t originate in a single region, but emerged as a synthesis of elements from a number of areas. It may be suggested that the maritime and AOC (all over cord) Beaker styles emerged, in an as yet unidentified region, through a combination of interactions which developed (or flourished) during the early 3rd millennium BC between Iberia and north-western France along the Atlantic façade, between France and the Netherlands and across the Strait of Gibraltar. Communication between France and the Netherlands is known to have occurred during the late Corded Ware Culture/Single Grave Culture (CWC/SGC) period from c. 2800 BC, as Grand Pressigny flint from the Loire region occurs in Dutch contexts and its exchange endured beyond the emergence of the Beaker ‘phenomenon’ (Vander Linden, 2004: 38, 2012: 72-74; van Gijn, 2009, 2010; Drenth, 2014). Furthermore, evidence indicates that during the 3rd-2nd millennia BC several maritories were developed and maintained along the North Sea coast both north and south of the Rhine-Meuse delta stretching between Brittany (and the Atlantic zone) and the Danish coastline along the Wadden Sea (and the Nordic spheres) (Needham, 2009; Roberts and Frieman, 2012; Fokkens, et al., 2013). It has been advanced (Lanting, 2007-2008; Beckerman, 2011/2012; Fokkens, 2012a) that in the Netherlands, previously advocated as the origin of the Beaker phenomenon (Van der Waals and Glasbergen, 1955; Lanting, and van der Waals, 1976), the transition to the Beaker phase began with the parallel diffusion of both local late CWC/SGC

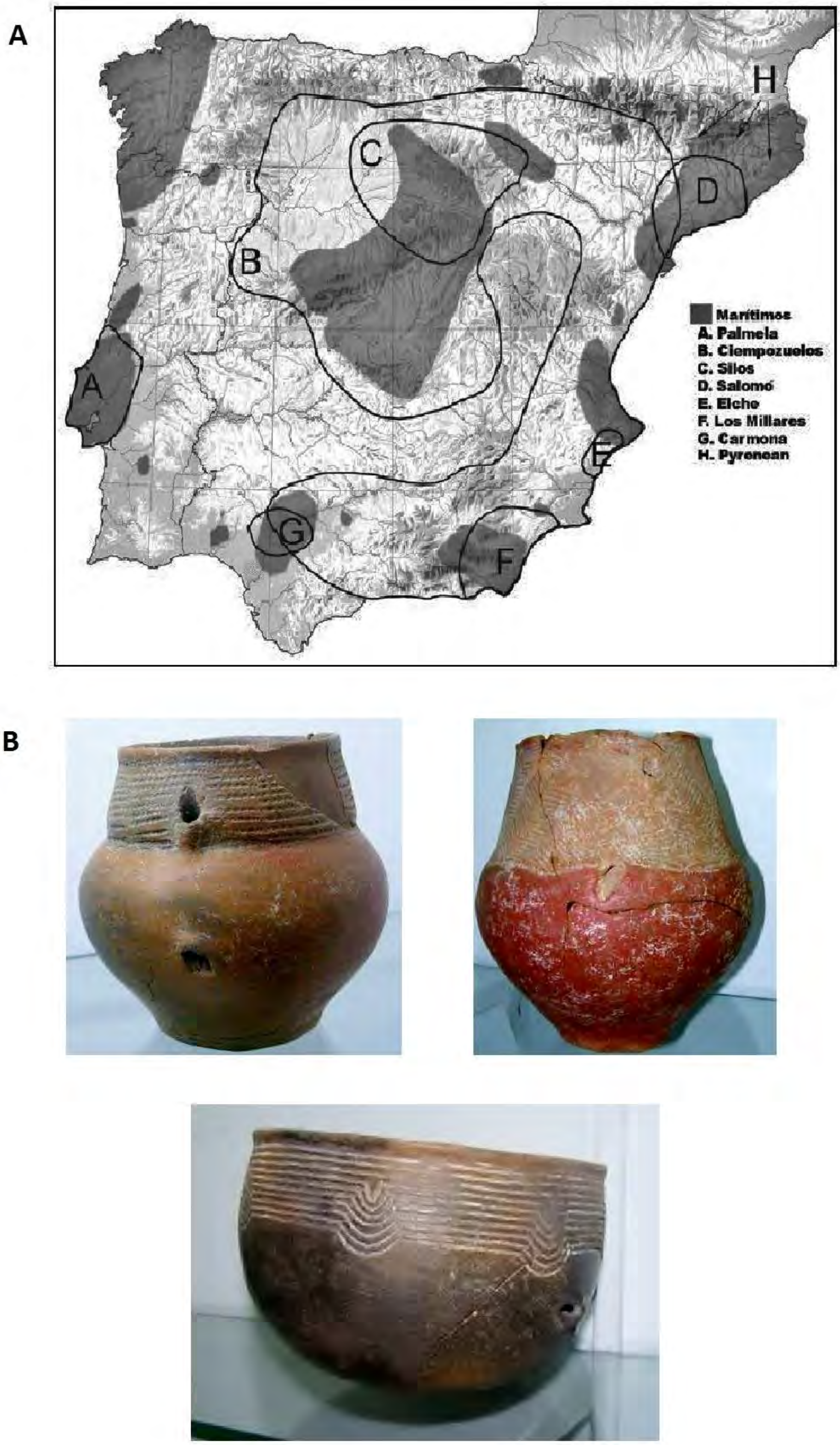


Figure 8.2: Regional Iberian Beaker styles and Moroccan Late Neolithic pottery. (A) Schematic distribution of Maritime and main Regional Beaker styles in the Iberian Peninsula (Bueno Ramírez, et al., 2008: Fig. 13.1.); (B) Moroccan Late Neolithic pottery from the cemetery at Skhirat (Turek, 2012: Figs. 3-5.)

(corded ware culture/single grave culture) and AOO/AOC Beakers, which share cord impressed decoration. The latter style continued into the established Beaker period when the maritime style arrived (c. 2450-2400 BC). The AOO/AOC ceramics may represent a 'hybrid' form introducing decorative elements from the CWC/SGC into the Beaker repertoire (Lanting, 2007-2008: 16) and the characteristic maritime style stamped decoration, which has no analogy in Europe, appears to have originated c. 3350-2660 BC in the Saharan Maghreb of North Africa (Figure 8.2; Case, 2004a: 14-15; Turek, 2012). In this context, it may be significant that there is evidence for contacts across the Straits of Gibraltar during the Neolithic in the occurrence of items of African elephant ivory in parts of Iberia, primarily the Tagus region of central Portugal and southern Spain (Harrison, 1977, 39; Harrison and Gilman, 1977; Cunliffe, 2001: 230; Schuhmacher, et al., 2009). Furthermore, as outlined below (8.4), it is clear that these contacts continued during the Beaker period.

The British burial orientation patterns (see 8.6.2) suggest differing sources of inspiration from the Continent and such conclusions are also indicated by the divisions between northern and southern British Beaker pottery forms (e.g. Boast, 2002: 99-104; Needham, 2005: 171-200; Sheridan, 2012: 45-46). The occurrence of Scottish 'Dutch style' graves, pottery, metalworking connections and at least one possible immigrant have been argued (Sheridan, 2008a: 252-258, 2012: 43-51; Curtis and Wilkin, 2012: 239-241; Shepherd, 2012: 167-169; Vander Linden, 2012: 77-78, 80) and the combination of evidence does support the occurrence of at least small-scale immigration from the Rhine-Meuse delta/Netherlands (or nearby areas), although there are those that disagree with this interpretation (e.g. Fokkens, 2012b: 116-120, 123). Different southern connections are also indicated by the identification of probable continental immigrants (possibly) from such areas as Brittany and the north Alpine area (Evans, et al., 2006; Chenery and Evans, 2011; Fitzpatrick and Barclay, 2011: 23-24; Sheridan, 2012: 43), but more generally it appears that Britain was engaged with various areas of the French-Dutch/North Sea axis as the earliest Beaker types found in Britain emerged between Normandy and the Lower Rhine (Needham, 2005: 174-183; Sheridan, 2012: 45).

The chronology of the Irish chalcolithic has been summarized (4.2.2) and will not be repeated at length. As discussed, evidence indicates that Beaker pottery, metallurgy, and wedge tombs all appeared in Ireland c. 2550/2500-2400 BC (Figure 8.7; e.g. Brindley, 2007: 297-301; Schulting, et al., 2008; Carlin 2011; Carlin and Brück, 2012; O'Brien, 2012a) and as outlined previously (4.4, 4.5.1.1, 4.5.2.2), there appears to have been a significant Beaker presence within the Boyne Valley, with the activity at Newgrange estimated within the current study to date to c. 2494/2476-2284/2273 cal. BC. The regional contacts suggested by various Irish Beaker-type artefacts will not be discussed at length (see O'Brien, 2012a; Carlin and Brück, 2012: 203 for recent summaries).

Figure 8.3: Initial Beaker dispersals and cultural interactions in north-west Europe, mid-3rd millennium BC (Needham, 2005: Fig. 3.)

Notwithstanding, it has been advanced (e.g. Case, 2001; O'Brien, 2012a: 214-218; Sheridan, 2012: 43-44) that the 'Beaker phenomenon' in Ireland was distinct from its manifestation in Britain. In this context it has been advanced (e.g. Carlin and Brück, 2012: 203; O'Brien, 2012a: 214-218, 2012b: 73-74, 2015: 130; Sheridan, 2012: 43-45) that the arrival of metallurgy, Beaker pottery, and wedge tombs, which may represent an insular variant of the Breton allees couvertes, in western/south-western Ireland, points to strong connections with Atlantic France, possibly involving 'Breton colonists'. However, Irish Beakers, notably examples from eastern and northern areas, include forms which suggest contacts with Wessex/southern Britain, the Lower Rhine region, and Central Europe (e.g. Carlin and Brück, 2012: 203; Sheridan, 2012: 50-51), while Irish bracers, for example, include a number of four-holed examples, indicative of northern European influences, in addition to the more commonly occurring two-holed Atlantic variant (Harbison

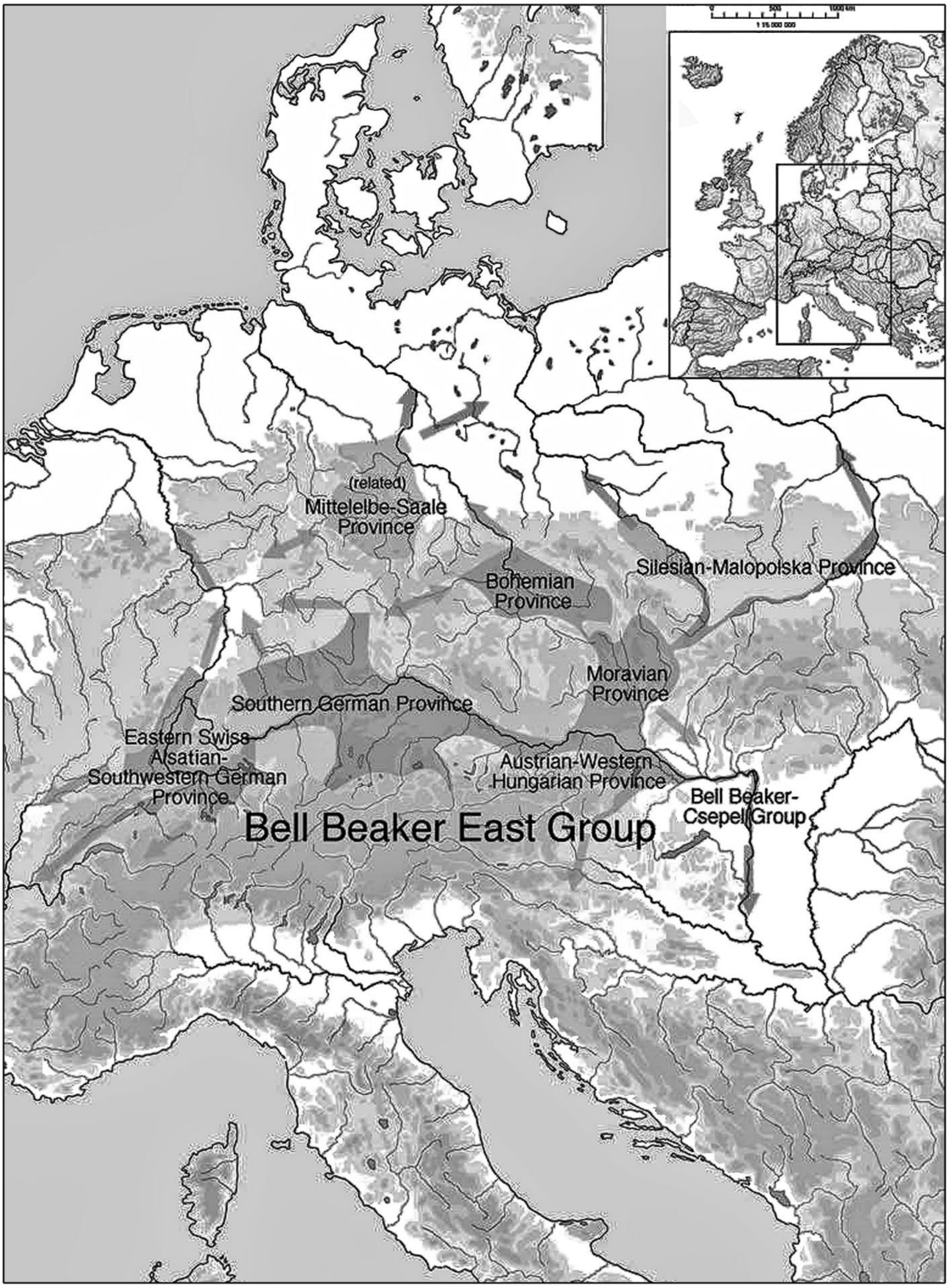


Figure 8.4: Distribution of the Bell Beaker East Group, with its regional provinces, as of c. 2400 cal BC (Heyd, 2007a: Fig. 2.)

1976; Woodward, et al., 2006: 534; Fokkens, et al., 2008: 112; Carlin and Brück, 2012: 203). It is clear therefore, that the Beaker phenomenon arrived in Ireland via contact with the maritime Iberian-French-Dutch Beaker network, but different areas of Ireland appear to have been

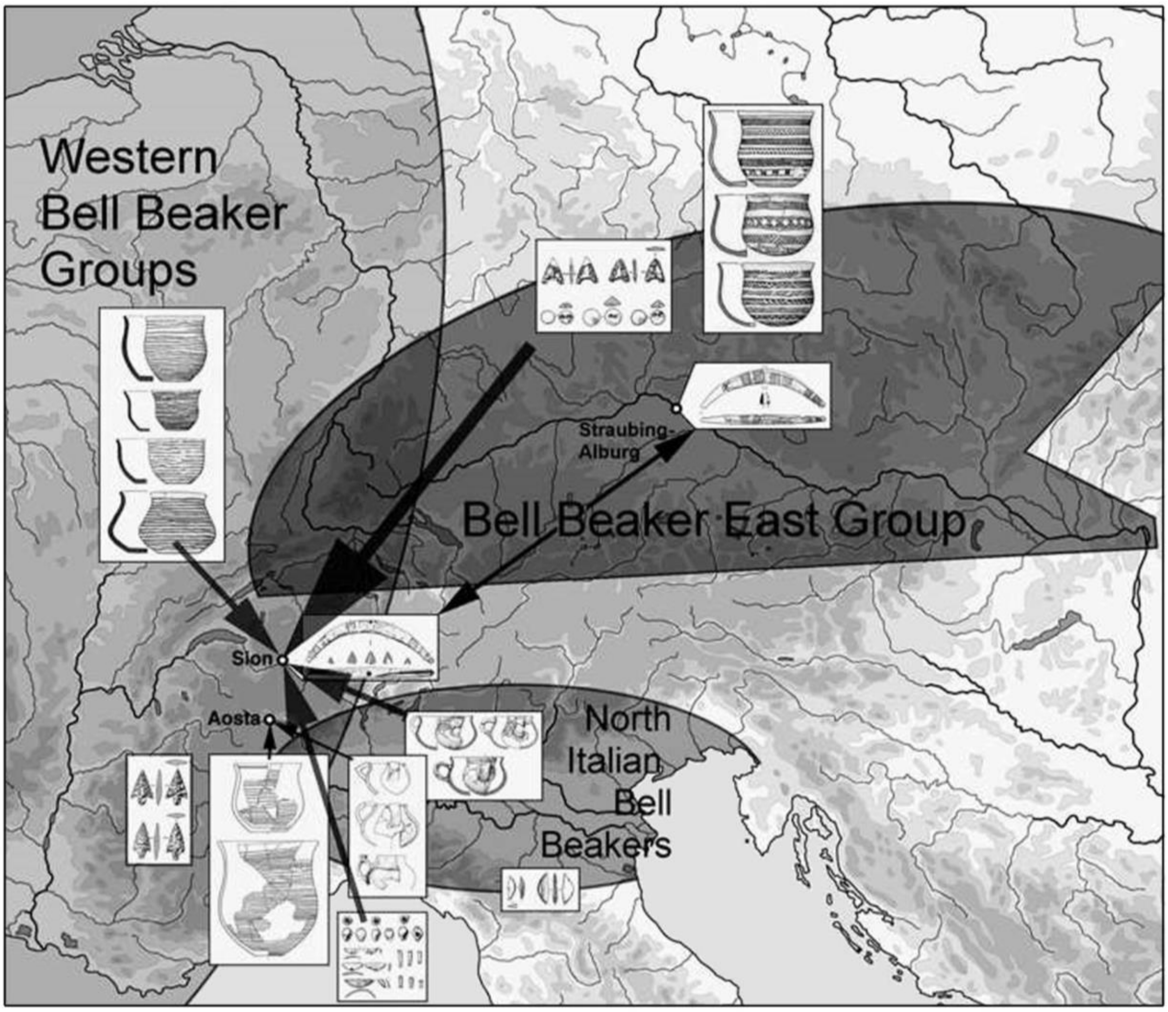


Figure 8.5: The probable geographical origins of the Bell Beaker material culture of Sion and Aosta (Harrison and Heyd, 2007: Fig. 40)

integrated into different parts of this network.

Current evidence (Price, et al., 2004; Desideri, 2008, 2011; Desideri, et al., 2010; Kern, 2012; Lee, et al., 2012; Ricaut, et al., 2012; Brandt, et al., 2013; Brotherton, et al., 2013) suggests that initial expansion of the Beaker complex involved migration from the south-west of the European Continent both northwards and north-eastwards through the Alpine region to Central Europe (Figure 8.5), where varying levels of mobility have been identified, followed by a secondary reflux towards Iberia. The advance of Beaker customs towards the northern and north-eastern peripheries of the distribution (Figure 8.4, Figure 8.6) are yet to be subjected to isotopic and aDNA analyses, but indications are that a combination of sources shaped their arrival. Beaker traits in northern Poland were connected with and derived from north-eastern Germany, Denmark and (Silesia) Bohemia (Makarowicz, 2003a: 137-138, 150; Czebreszuk and Szmyt, 2012: 158-165), while those in southern Poland were an "offshoot" of those from Moravia, with

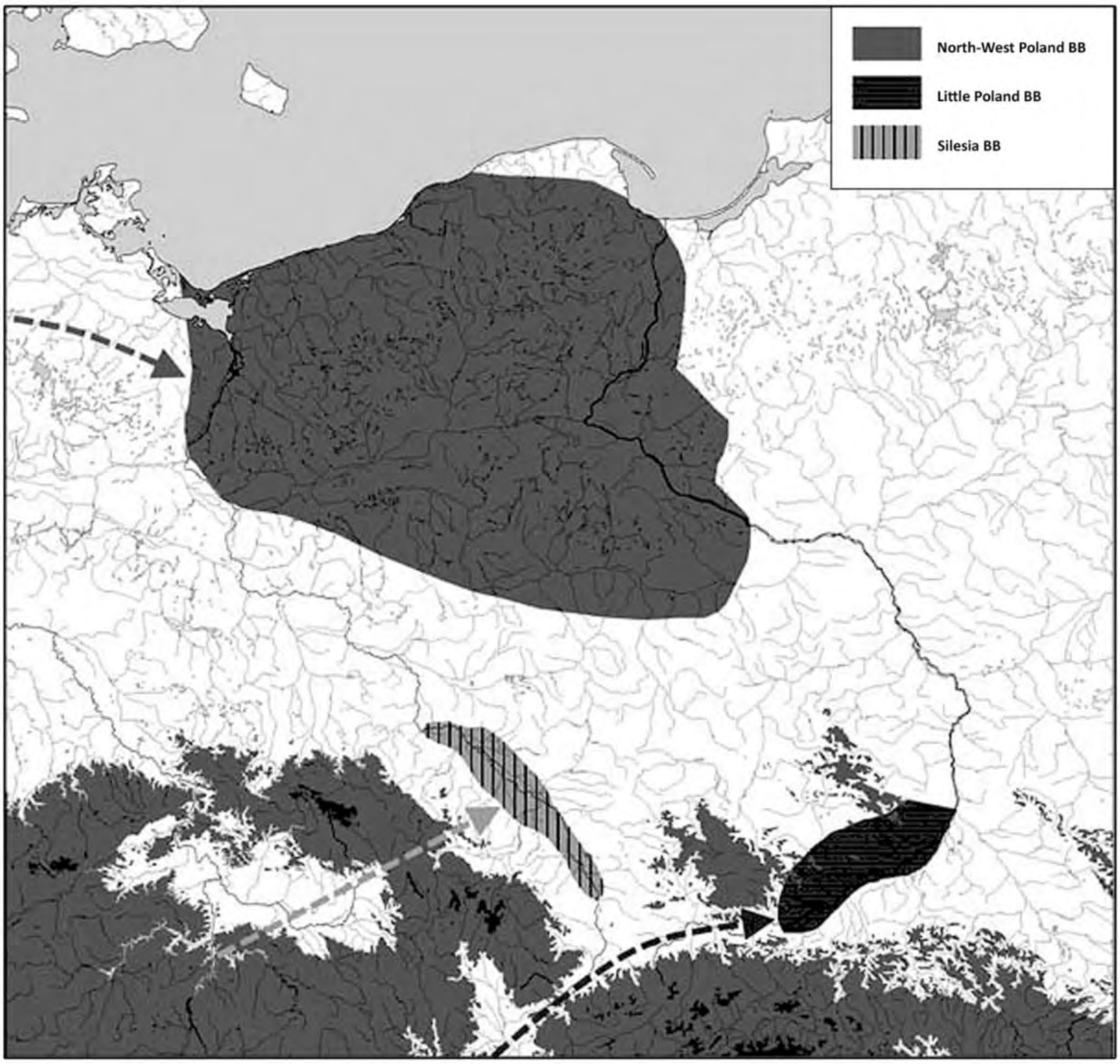


Figure 8.6: Bell Beakers in Poland and its connections with other Beaker centres (Czebreszuk and Szmyt, 2012: Fig. 2.)

additional connections to the Hungarian Csepel-Group (Figure 8.6). A combination of archaeological and anatomical analyses suggests that the appearance of Moravian style Beakers in southern Poland involved small-scale migration (possibly predominantly males) from north of the Carpathians (Budziszewski, et al., 2003; Makarowicz, 2003a: 137, 150, 2003b: 147; Budziszewski and Włodarczak, 2010; Czebreszuk and Szmyt, 2012: 158). The scientific analysis undertaken on Beaker period material is not advanced enough yet to shed light upon potential associations of locals and non-locals or ancestry with particular sets of grave goods and/or ‘archery symbolism’. Nevertheless, the potential that some patterns may be discernible within Beaker-using populations in the future may be hypothesized as these types of patterns have been revealed within the German Early Neolithic Linearbandkeramik (LBK) (Bentley, et al., 2002; Bentley, 2007; Price and Bentley, 2005: 208-211).

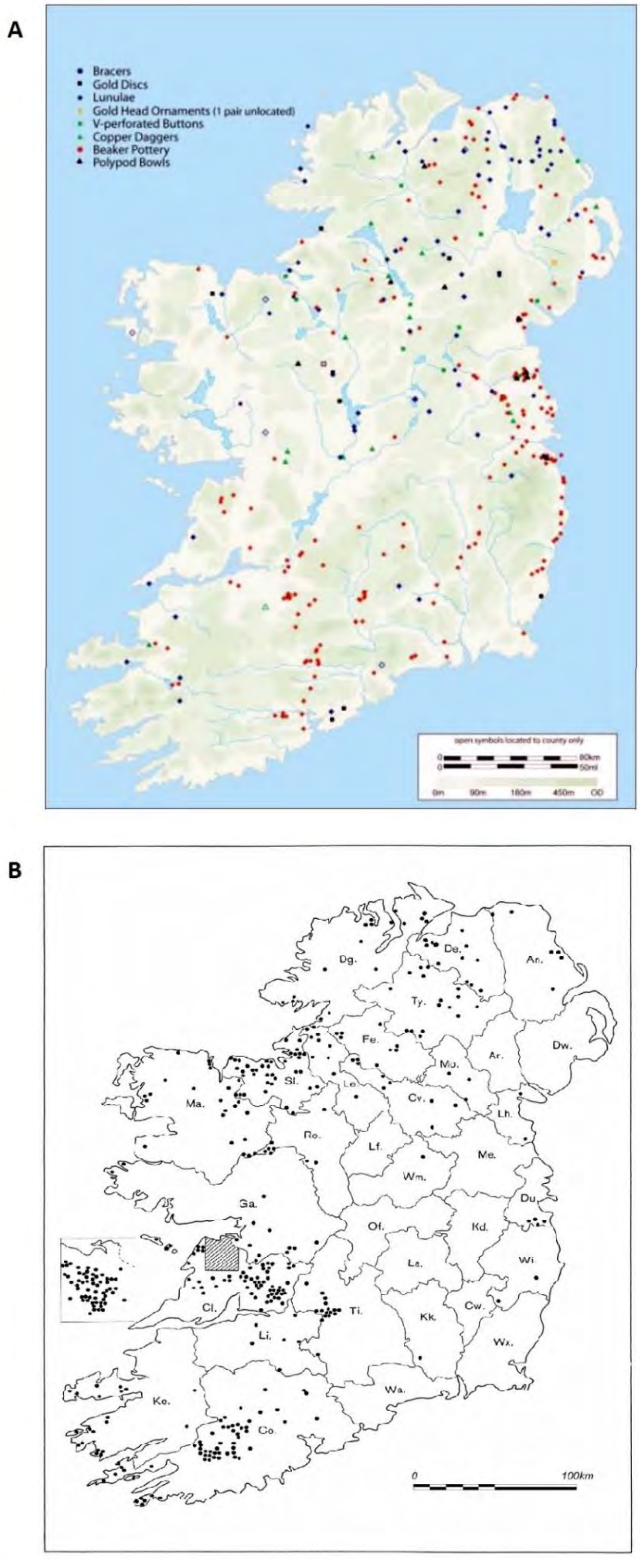


Figure 8.7: Evidence for the Chalcolithic in Ireland. (A) The distribution of all Beaker objects and pottery in Ireland (Carlin, 2011: Fig. 9.30.); (B) The distribution of wedge tombs in Ireland (Jones, et al., 2015: Fig. 1)

8.3 Changing Social Structures?

The Beaker period was undoubtedly characterized by some form of change to the structure of societies, but it should not be assumed that there was a uni-directional advance towards more hierarchical social structures characterized by the rise of socio-political elites engaged in 'prestige networks' and associated consumption practices as has sometimes been argued (e.g. Clarke, 1976; Shennan, 1976; Harrison, 1980; Sherratt, 1987). Kunst (2001, 2005: 221-222, 2006) is perhaps correct in his assertion that in Portugal (and potentially areas of Spain) if there was a significant shift in the social structure this may have occurred prior to the emergence of the Beaker Culture during the local Early Copper Age. It was during this period (within the Portuguese Vila Nova de San Pedro-Culture) that the first fortifications were constructed, trade networks were established (e.g. ivory and ostrich shell from North Africa) and both copper and gold were first exploited. A comparable situation is also evident in southern Iberia where fortified settlements, were established in the south-west in such locations as Valencina de la Concepción, (Seville), La Pijotilla (Extremadura) and Los Millares (Andalusia) in the south-east around the same time (Kunst, 2001, 2006; Guilaine and Zammit, 2005: 188-191; Thorpe, 2013: 594-596; Garrido Pena, 2014: 18) and were engaged in similar networks. Some researchers (e.g. Cámara and Molina 2006; Nocete, et al., 2010) have argued that this represents the formation of Early Chalcolithic 'State Societies', citing a shift to single burial and the association of children with grave goods in such contexts (i.e. a breakdown in 'parental ideology' as expressed in collective burial customs), in addition to the establishment of fortified sites, as corroborative evidence. However, as emphasized by García Puchol et al. (2013: 271-273; see also Gibaja, et al., 2010: 63-64) individual burials were a feature of the entire Iberian Neolithic and these included children with grave goods. Furthermore, it is clear that collective burial customs continued throughout the 3rd millennium BC and the hypothesis appears untenable.

Between c. 2700 and 2500 BC, limited amounts of Beaker pottery appeared alongside indigenous forms on many of the fortified sites in Iberia, but these sites were in a state of rapid decline when Beaker material first appeared (Cardoso, 2004, 2104). However, the use of fortified settlements was maintained during the Beaker-using phase with additional sites, such as the site at La Motilla del Azuer (Ciudad Real) in Central Iberia (Jiménez-Brobeil, et al., 2014), being established c. 2200 BC. Available evidence suggests that in the areas where these fortified settlements occurred there were communities with some level of segmentation or economically based intra-group differentiation. In these areas regional social formations appear to have been segregated into (at least) two interdependent sub-groups, one which occupied the fortified sites, the other consisting of small dispersed farming communities, engaged in numerous family-based agricultural-pastoral activities (Guilaine and Zammit, 2005: 188-191; Cardoso, 2014: 71-73). In many regions of Iberia evidence suggesting the development of social complexity or stratification during the 3rd millennium BC is absent. It has been suggested (Garrido Pena, 2006, 2014: 123) that this may indicate that these groups had a 'transegalitarian' form of segmentary social structure, lying at a transitional stage between the 'local group' and the 'regional polity' or somewhere between ranked and stratified societies (potentially) in the process of evolving from an egalitarian to a hierarchical model.

Following the initial arrival of Beakers in southern France, when sites were established along the coast and the principal rivers going into the continent, burial customs continued to be collective in nature. During the later Beaker phase, sites were mainly concentrated in the lower basin of the Rhône, but they also occur from the Pyrenees to the Alps, and within the Lyon region, Ain, Saône-et-Loire and Auvergne regions. During this period, which appears to have witnessed the arrival of groups from the east, new enclosed or fortified hilltop sites were established and small cemeteries of individual burials developed (Lemercier and Tchérémissinoff, 2011; Lemercier, 2012a, 2012b). Salanova (2005) has argued that in this region the arrival of the Beaker assemblage did not result in the creation of new social structures, but as in parts of Iberia, a shift in the social structure in the later phases is feasible. Nevertheless, the advent of Beaker phenomenon in south-eastern France does not appear to have instigated heightened social competition or initiated a process leading to more complex societies in the region (Pétrequin and Pétrequin, 1988: 262; Vander-Linden, 2006b: 325-326).

In Bohemia and Moravia what has been described as a transitory period of "emulatory competition" among proto-Beaker groups does not appear to have heralded the materialization of hierarchically stratified social organisation (Brodie, 1997: 309-10). It has been advanced (Heyd, 2007a: 335-340, 358-359) that along the Upper and Middle Danube, Beaker societies display an intermediate position between ranked and stratified societies, with signs that they were evolving towards simple chiefdoms (which undoubtedly emerged during the 2nd millennium BC). In this region, no 'central places' or fortified/hilltop sites have been identified and it has been proposed that communities were composed of small, family-based, economically somewhat specialised (breeding cattle or in some instances horses) social units (i.e. generally equal, independent, single farmsteads) and there is no evidence for supra-regional power structures or social organisation. In addition, Heyd (*ibid*.: 351-352) contends that there are no indications of inter-cemetery differentiation, i.e. that there was no hierarchical differentiation between groups. He suggests that they co-existed as equals, with loose regional connections and leadership.

The forms of social organization in other regions following the adoption of Beaker Culture have also been described in similar terms and indications of sudden or radical alterations to the structures are absent. For instance, 'transegalitarian' forms of social organization characterized by relatively dispersed settlement patterns and an absence of fortification and centralization appear to be evident in the Netherlands (Fokkens, 1999), Poland (Makarowicz, P., 2003a, 2003b), and also Denmark and Norway (Vandkilde, 2005, 2007; Prescott, 2012; Turek, 2013c: 14-15) following their relatively late adoption of Beaker Culture.

In Britain, interpretations of social structure have tended to follow the models established in the 1970s and 80s (e.g. Clarke, 1976; Shennan, 1976; Harrison 1980; Clarke, et al., 1985; Shennan, 1982, 1986; Sherratt, 1987) with continued emphasis on the emergence of hierarchical structures and resource controlling 'elites' (e.g. Needham, 2000, 2009; Sheridan and Davis, 2002: 824; Sheridan and Shortland, 2004: 276; Bradley, 2007: 156; Sheridan, 2008c: 67-70; Needham, et al., 2010: 30-33), although there have been suggestions that long-distance trade may have been 'cosmologically driven' (Needham, 2000, 2009; Van de Noort, 2006, 2009, 2012), and some scholars (e.g. Wilkin, 2011; Curtis and Wilkin, 2012) recognize probable regional variations in social structure. Furthermore, with the development of greater chronological understanding of British Beaker burial customs it has become aparent that both 'archery' and 'lavishly furnished' burials in Britain tend to date to c. 2300/2200-1900/1800 BC (e.g. Needham, 2005, 2012; Wilkin, 2011; Woodward and Barclay, 2011: 86-107; Curtis and Wilkin, 2012: 240-241; Sheridan, 2012: 48-52). This could indicate that, as suggested by O'Brien (2012a: 214) in the Irish context c.2200-2150 BC, increased status and role differentiation associated with emergent hierarchisation may not have begun until c. 2300-2200 BC in Britain. In addition, it has been recognized (e.g. Cleal and Pollard, 2012; Garwood, 2012) that 'early' Beaker burials tend to occur on the periphery of ceremonial complexes. These patterns undoubtedly raise questions about the form(s) of Beaker-associated social structures present in Britain c. 2500/2400-2200 BC, but alternatives to the 'traditional' model are yet to be advanced.

It has been advanced (O'Brien, 2012a: 214-215) that Chalcolithic Ireland was not only characterized by a mosaic of regional identities, but also considerable variability in social structures across different "territorial-identities". In the south-west of the country it has been advanced, that wedge tomb-using groups in counties Clare (Jones, et al., 2015) and Cork (O'Brien, 1999a: 254-262, 2000, 2007: 25-26, 2012b: 85-86) were probably small-scale segmentary societies comprised of local, autonomous descent groups that may have been affiliated by marriage relationships into larger clan-like groupings. Although there is little evidence for hierarchisation among or between these groups O'Brien (2012b: 86) has suggested that the small number of internments in these monuments could indicate emergent differentiation between lineages, and perhaps the beginnings of new social formations based on “ruling lineages”, or even “individual leadership”. It has been suggested (O'Brien, 2004: 570, 2012a: 221, 2012b: 91) that increased social differentiation and the emergence of hierarchies may have occurred among groups extensively involved in trade networks, and the circulation, potentially extending to ‘control’, of metal supplies. In this context, O'Brien (2004: 570-572, 2007: 26-27, 2012a: 221-223, 2012b: 90-91), has argued that copper mining at Ross Island (Kerry), and social groups across north Kerry region, may have been controlled by “Lunula Chiefs” within a centrally organised hierarchical society.

8.4 Intensification of Exchange and Trade Networks

Undoubtedly the Beaker period heralded economic intensification, population growth and critically increased mobility and the emergence of new social networks which facilitated the diffusion of people, knowledge and materials. Recent research (Brodie, 1997; Case, 2004a: 22; Vander Linden, 2004, 2006a, 2006b, 2007a, 2007b; Desideri and Besse, 2010) has proposed that these networks were maintained, at least partially, by the occurrence of exogamous marriage patterns, a hypothesis which has been affirmed by a growing body of scientific analyses (Budziszewski, et al., 2003; Price, et al., 2004; Heyd, et al., 2005; Evans, et al., 2006; Needham, 2007; Desideri, 2008, 2011; Desideri, et al., 2010; Chenery and Evans, 2011; Kern, 2012; Lee, et al., 2012; Ricaut et al. 2012; Brandt, et al., 2013; Brotherton et al., 2013), indicating that at one level social ties were created between many groups through immigration/emigration and the development of new kinship patterns. Although discussion of the forms of trade and exchange that may have been employed during the 3rd millennium BC is outside the scope of the current study, it is apparent that engagement in the extensive networks that were maintained and developed during the Beaker period (many of which appear to have continued into the 2nd millennium BC) were an important feature of the period and perhaps a key component of the ‘culture’. In fact numerous researchers (e.g. Hurtado Pérez, 1997, 1999; Case, 2004a: 22; Vander Linden, 2004: 38, 2007a; Needham, 2005, 2012; Salanova, 2005, 2008; Lemercier, et al., 2007; Desideri and Besse, 2010; Kohring, 2011; Cleal and Pollard, 2012; Fokkens, 2012a, 2012b; Lemercier, 2012a, 2012b; Roberts and Frieman, 2012; Van de Noort, 2012; Garrido Pena, 2014) have commented on the fact that across Europe various Beaker using communities were established strategically to engage in these (frequently maritime/riverine) networks and that pre-existing communities involvement in these systems may have contributed to Beaker adoption.

The existence of communication and trade networks extending eastwards (and south-east) beyond the 'borders' of the "Beaker world" are also apparent. For instance, contacts between Polish Beaker groups on the north-eastern periphery of the distribution and communities to the east are indicated by the occurrence of Beaker-type decoration on pottery, Danish flint daggers and occasional Beaker-type copper artefacts around the Baltic and as far east as northern Belarus (Heyd, 2007b: 99; Turek, 2013c: 15). In addition, material originating in the Beaker–Csepel communities of Hungary, who controlled the strategic areas on the Danube and the eastern fringes of the Beaker distribution, has been recorded on various non-Beaker sites in eastern Croatia and Serbia, particularly along the Middle Danube and Serbian Morava rivers (Heyd, 2007b: 95, 100; Kalafatić, et al., 2008: 42-44; Turek, 2013c: 12-14), and material with Beaker motifs occurs further to the south-east in the Transylvanian area of Romania (Heyd, 2007b: 99; Turek, 2013c: 14). The occurrence of Beaker-type material on the small island of Palagruža in the middle of the Adriatic Sea, between northern Puglia (54 km from the coast) and southern Dalmatia (100 km) suggests engagement between Beaker groups and eastern Mediterranean societies, as does the occurrence of Beaker-type decoration in Slovenia, Albania and Malta (Heyd, 2007b: 95-98, 100; Turek, 2013c: 11, 15). Contacts between Greece, the Near/Middle East and the western Mediterranean is alluded to in the occurrence of Asian elephant ivory in Iberia (Schuhmacher, et al., 2009) and alleged Beaker type material in Crete and Greece (Heyd, 2007b: 100-101; Turek, 2013c: 15-16), and it has been suggested that the occurrence of possible Greek-style material in Italy and Iberia may support such contact (Rahmstorf, 2008). However, the nature and degree of contacts between Beaker-using communities and areas of the eastern Mediterranean is still unclear and open to discussion (see Heyd, 2007b; Rahmstorf, 2008; Turek, 2013c).

The occurrence of Beaker material and occasional burials on the larger islands of the western Mediterranean is indicative of maritime contacts around the region (Turek, 2013c: 10) and the Maghreb region of north-west Africa (Gilman, 1974; Harrison and Gilman, 1977: 91, 93-95; Harrison, 1977: 39-42, 1980: 157-158; Cunliffe, 2001: 230; Schuhmacher, 2002: 267-270, 273; Papa, 2008/2009: 60; Bokbot and Ben-Nçer, 2006), in addition to numerous rock art sites featuring depictions of Iberian/Beaker-type artefacts in the High Atlas and Anti-Atlas mountain ranges in the latter region (Papa, 2008/2009: 59-61) are indicative of maritime contacts across the Straits of Gibraltar and around the western Mediterranean region. Trade across the Straits of Gibraltar is perhaps most visible in the occurrence of African elephant ivory and ostrich eggshell in central Portugal and southern Spain (Harrison, 1977, 39; Harrison and Gilman, 1977; Chapman, 1990: 178-195; Cunliffe, 2001: 230; Mitchell, 2005: 56). It may be advanced that the results of recent analysis of the Iberian material (Schuhmacher, et al., 2009) could indicate that the Tiaret region of Algeria, an area where Beaker-type finds have been recorded, could have been the source of ivory and eggshell, as it would have been one of the most suitable areas in the Maghreb for African savannah-type fauna, and elephants survived in the region into the Roman period (Gilman, 1974: 280; Harrison and Gilman, 1977: 91).

It would be naïve to believe that a plethora of substances and materials were not disseminated over long distances, but many of these would not necessarily be archaeologically visible. For instance, salt which would have been an important commodity, was mined during the Chalcolithic, if not earlier, in the Zamora area (Castile and León) north of the Duro River in north-west Spain (Weller, 2002; Guerra Doce, et al., 2011) and must have been traded extensively, but evidence for its presence in archaeological contexts is absent, (to the best of the current authors knowledge). It is also known to have been mined during the Neolithic in Romania (Weller and Dumitroaia, 2005) and France (Morin, et al., 2006). The earliest dates for salt extraction from Hallstatt in Germany are from the mid-2nd millennium BC (Grabner, et al., 2007), but it is possible that workings in the region began at an earlier stage. Evidence for small-scale salt production has also been noted on occasion at sites dating to the earlier 2nd millennium BC. Briquetage ceramics, coarse pottery designed for extracting salt from seawater, have been found at EBA burnt mounds in Britain and within Unẽtician ceramic assemblages in eastern Germany (Harding, 2000: 251-252; Roycroft, 2006).

Amber from the Baltic, the long-distance trade of which was established in the 4th millennium BC, appears across Europe, typically in the form of v-perforated buttons, during the Beaker period (Czebreszuk, and Makarowicz, 1993; Czebreszuk, 2003b, 2007; Heyd, 2007a: 344; Rowlands and Ling, 2013), including contexts as far west as Iberia (Bueno Ramírez, et al., 2008: 151; Murillo-Barroso and Martinón-Torres, 2012) and Britain (Shepherd, 1985; Beck and Shennan, 1991; Woodward, 2002; Sheridan, 2008b). In addition to amber specimens buttons of whale and both African and Asian elephant ivory were more common in Iberia (Schuhmacher, et al., 2009, 2013; Garcia Sanjuán, et al., 2013; Nocete, et al., 2013). V-perforated buttons and beads of jet (a large proportion of which originated in Whitby, north Yorkshire), and other similar black-coloured materials, were in circulation throughout the British Isles (Harbison, 1977; Pollard, et al., 1981; Shepherd, 1981, 1985, 2009; Sheridan and Davis, 1988, 2002; Woodward, 2002; Hunter, et al., 2007; Sheridan, 2012: 48).

South-to-north networks along the Alpine Valleys were employed in the circulation of Mediterranean mussels (*Spondylus*) and gastropod (*Columbella rustica*) shells into Central and Eastern Europe, especially into southern Germany and eastern Switzerland, apparently indicating a central Mediterranean connection with the shells originating on the Italian coast during the Beaker period. This communication corridor along the Alpine Valleys initially developed during the 4th millennium BC and had been utilized for the transport of southern Alpine 'Monte-Lessini' flint daggers to areas north of the Alps (Heyd, 2007a: 344-345). During the mid-3rd millennium BC Grand Pressigny curve-bladed flint daggers were exported in large numbers from the Loire in France across Western and Central Europe (Vander Linden, 2004: 38, 2012: 72-74; Needham, 2005: 177; Skak-Nielsen, 2009: 350; van Gijn, 2009, 2010; Drenth, 2014) as were straight-bladed daggers of Danish flint (from northern Jutland and the eastern shores of Zealand and Møn), which were also traded to Sweden and Norway (Apel, 2001: 294-304; Vandkilde, 2005: 32, 2007; Sarauw, 2007: 80, 2008a: 37, 2008b). The shape of the Danish daggers was inspired by those of Central Europe (Apei 2001; 248-51; Vandkilde 2005: 26) which were in turn derived from the Italian template which originated in the 4th millennium BC (Heyd, 2007a: 344-345).

The most emblematic materials to have been widely circulated during the Beaker period are of course metals, primarily copper and gold. The networks of copper distribution, which involved a variety of regional sources, would have been of prime importance (e.g. Amzallag, 2009; Roberts, 2009; Roberts, et al., 2009; Earle, et al., 2015; O'Brien, 2015). The artefacts present in Scandinavia for instance were primarily made of imported metals (e.g. Liversage and Northover, 1998; Melheim, 2011; Ling, et al., 2013, 2014; Rowlands and Ling, 2013) while in western Europe a number of regions produced and exported copper (e.g. Northover, 1982; Roberts, 2007, 2009; Müller and Cardoso, 2008; Fontijn, 2009; Stos-Gale and Gale, 2010; Roberts and Frieman, 2012; Valério, et al., 2014; O'Brien, 2015: 77-123), including the British Isles (e.g. O'Brien, 1990, 1995, 1999b, 1999c, 2003, 2004, 2015: 125-155; Ixer and Budd, 1998; Rohl and Needham, 1998; Northover, 1999; Northover, et al., 2001; Fontijn, 2009; Timberlake, 2009; Bray and Pollard, 2012; Timberlake and Marshall, 2013), in addition to such areas as the Alpine region (e.g. Artioli, et al., 2013; O'Brien, 2015: 117-121, 161-184) and the Balkans (e.g. Görsdorf, et al., 2004; O'Brien, 2015: 37-54). Tin sources appear to have been more limited at a European level and following the development of Bronze (towards the end of the Beaker period in some areas), south-western England may have been an important source alongside Iberia and Brittany (Budd, et al., 1994; Pare, 2000).

The earliest copper artefacts in southern England (c. 2600-2500 BC) were made from copper imported from as yet unidentified Continental sources (Northover, 1999). However, the overwhelming majority of early copper objects (c.2500-2400 BC) in Ireland (>95%) and Britain (80%) were made from a distinctive fahlore ('A metal') suggested to derive from a single source (Ixer and Budd, 1998; Rohl and Needham: 1998; O'Brien, 1999b: 147-149, 1999c: 35-36;

Northover, et al., 2001: 28). The copper mine workings on Ross Island (beginning c. 2500-2400 BC), near Killarney (Kerry) in south-west Ireland (O'Brien, 1995, 1999c: 36-37, 2004: 127-154, 2015: 127; Ixer and Budd, 1998: 32; Northover, et al., 2001: 28-29; Lanting, 2004), being the most probable source of this ore (Ixer and Budd, 1998: 32-36; O'Brien, 1999b: 149-151, 1999c: 37, 39-41, 2015: 129-130; Northover, et al., 2001: 40-41, 45, 2004; Northover, 2004).

Iberia appears to have been an important gold source and it has been argued that alluvial gold was sourced in Central Portugal along the Tagus (Bueno Ramírez, et al., 2008: 151-155) and south-western Iberia appears to have been a major source of gold during the Beaker period with two differentiated and independent supplies of raw material systems (fluvial placers vs. mines and local vs. regional scale) and at least four source areas (Nocete, et al., 2014). It appears that in Central Europe gold sources were different to those utilized in Western areas (Vandkilde, 2005: 24-25) and thus may have been sourced north of the alps or in south-eastern Europe (see Morteani, and Northover, 1994; Armbruster, 2013). Gold appears to have been sourced and circulated around the British Isles and various regions in both Ireland and Britain have been mooted as the primary source (Chapman, et al., 2006; Warner, et al., 2009, 2010; Standish, et al., 2014, 2015).

8.5 Beaker-using communities and contemporary non-Beaker societies

It is clear that there was contact between Beaker-using communities and contemporary non-Beaker societies both during various local and regional transitions to the Beaker period and subsequently. For instance, as noted elsewhere (Chapter 4) there are clear indications for overlaps between native Grooved Ware and the incoming Beaker complexes on sites in Britain and Ireland (see also Brodie, 1997; Needham, 2005, 2012: 17-23; Wilkin, 2011; Carlin and Brück, 2012; Cleal and Pollard, 2012; Curtis and Wilkin, 2012; Garwood, 2012) and similar circumstances have been noted across Europe (e.g. Czebreszuk and Makarowicz, 1993; Makarowicz, 2003a: 137-138; Cardoso, 2004, 2014; Salanova, 2005, 2008, 2011; Vandkilde, 2005, 2006, 2007; Heyd, 2007a; Czebreszuk, and Szmyt, 2012).

However, there were instances where groups made a conscious decision not to adopt Beaker Culture despite living in close proximity to contemporary Beaker groups. For instance, such a situation is evident in Iberia where communities belonging to native Chalcolithic cultures co-exited alongside but never merged with new Beaker groups in the Lower Estremadura area along the Tagus River in Central Portugal (Cardoso, 2014: 73). Another example is the Upper Danube area of Central Europe where various communities of Corded Ware and Beaker using groups existed side-by-side for nearly 300 years during the 3rd quarter of the 3rd millennium BC until the

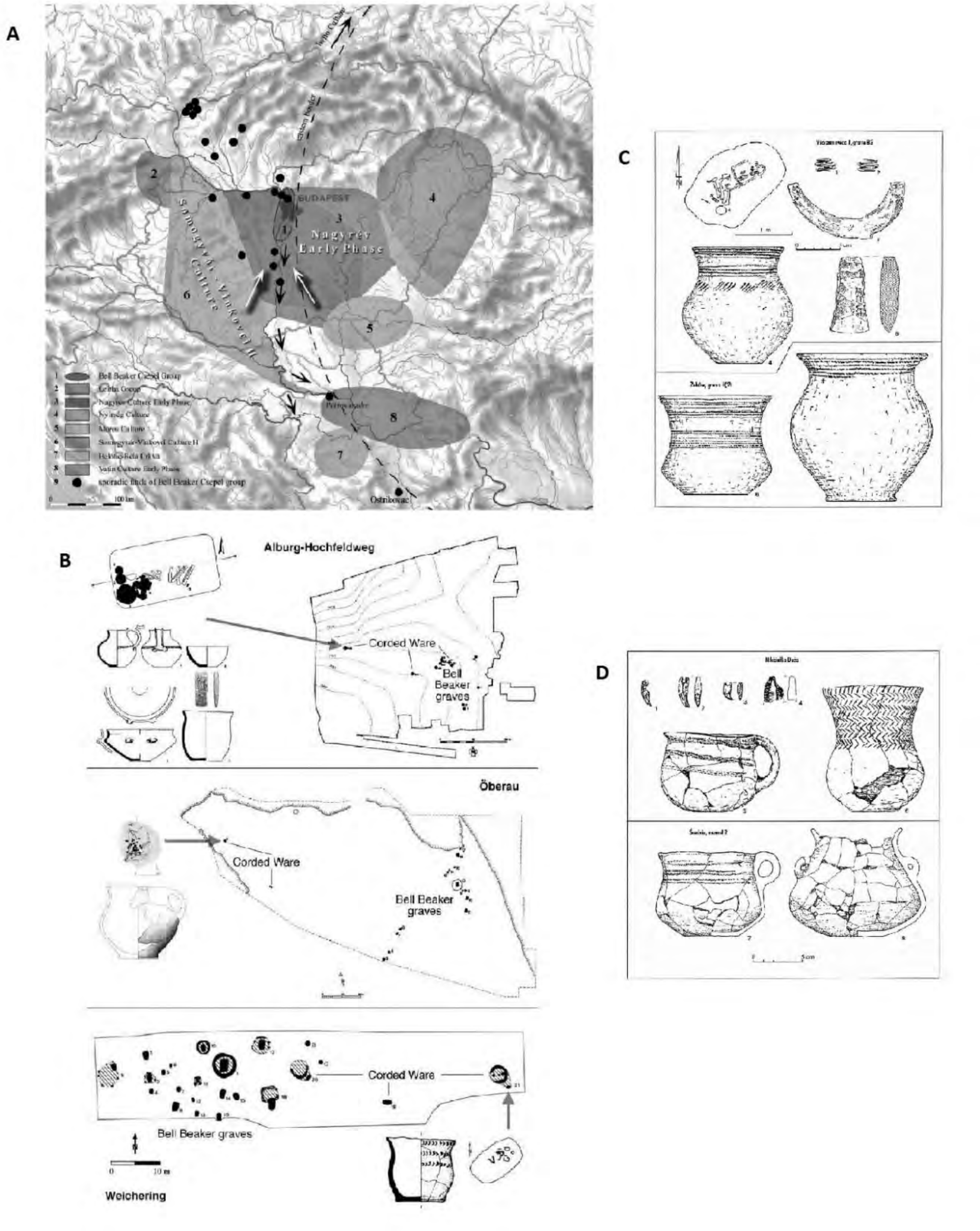


Figure 8.8: Beaker and contemporary groups. (A) The Beaker-Csepel group in Hungary and its proximity to neighbouring groups (Endrődi, 2013: Fig. 1.); (B) Bi-cultural Beaker-Corded Ware cemeteries at Straubing-Alburg, Straubing-Öberau, and Weichering in Germany (Heyd, 2007a: Fig. 24.); (C) Examples of stylistic influences exerted by the Polish Beaker groups on the Cracow-Sandomierz Corded Ware group. Inventory of grave 83 in Mierzanowice and ceramic artefacts from grave 1[2] in Żuków (Budziszewski, et al., 2003: Fig. 16.); (D) Mixed assemblages showing Corded Ware and proto-Mierzanowice phase features from Nikisiałka Duża and Średnia in Poland (Budziszewski, et al., 2003: Fig. 18.)

beginning of the Early Bronze Age (Heyd, 2007b: 361-368, and references). Evidence for contacts between Beaker groups and contemporary cultures are particularly strong in the peripheral areas of Moravia, Poland and Hungary, as indicated by the presence of Beaker-type material on non-

Beaker sites in adjacent areas (Heyd, 2007b: 92-94, 99; Růžičková, 2009: 58-59). The Beaker–Csepel communities in Hungary were located in extremely close proximity to neighbouring proto-(early) Nagyrév communities of the Corded Ware culture in Slovakia and Hungary (Figure 8.8). Particular confirmation of this situation is indicated by the occurrence of graves belonging to the latter culture in a distinct cluster at the edge of, but separate from, the Beaker cemetery at Budatétény and Nagyrév-type vessels in a pit within a Beaker settlement at Szigetszentmiklós-Üdülősor (Endrődi, 2013). A particularly complex situation is apparent in Poland where Beaker-Inwo communities lived alongside other cultural groups, including communities of Globular Amphora Culture, CWC/SGC groups (including proto- Únìtice communities) and proto-(early) Trzciniec Culture groups (c. 2400-2000 BC). Indications are that in addition to connections between the Beaker and the CWC/SG groups there were also affiliations with the proto-(early) Trzciniec and proto- Únìtice communities (Figure 8.8). However, there is little evidence for contact between the Beaker-Inwo (or the CWC/SG groups for example) and their Globular Amphora Culture neighbours and it has been suggested that these groups were isolated from one another in the Kujawy area for c. 200 years (c. 2400-2200 BC), and there appears to have been only a negligible amount of cultural borrowing between these groups (Budziszewski, et al., 2003; Makarowicz, 2003a: 150, 152, 2003b: 147; Budziszewski and Włodarczak, 2010; Czebreszuk and Szmyt, 2012; Górski, et al., 2013; Wencel, 2015). There are occasional examples of bi-cultural Beaker-Corded Ware cemeteries at such locations as Straubing-Alburg, Straubing-Öberau, and Weichering in Germany (Figure 8.8; Heyd, 2007a: 362-368), suggesting possible social connections between neighbouring groups. There are also instances, such as the emergence of Food Vessel traditions in Britain (e.g. Sheridan, 2004b; Wilkin, 2011; Curtis and Wilkin, 2012; Wilkin and Vander Linden, 2015: 110-111) and Ireland (e.g. Waddell 1990; Ó Ríordáin and Waddell, 1993; Mount, 1997a, 1997b, 2013; Brindley 2007; Cahill, and Sikora, 2012; O'Brien, 2012; Bayliss and O'Sullivan, 2013; Grogan, 2013), where new cultural groups developed from, or alongside, Beaker using communities, and variously replaced or existed in juxtaposition to Beaker-using groups.

8.6 The Act of Burial

Acts of Chalcolithic-Bronze Age burial, and their associated customs, have come to be analysed and understood from a variety of perspectives. These include exploration of burial practices in terms of fragmentation and circulation (e.g. Woodward, et al., 2005; Brück, 2006a; Duffy and MacGregor, 2008; MacGregor, 2008; Chapman, 2010); as social transactions reconstituting the social identity of the deceased and redefining relationships among the living (e.g. Mizoguchi, 1993; Thomas, 2000; Woodward, 2002; Fowler, 2005; Oestigaard and Goldhahn, 2006); and

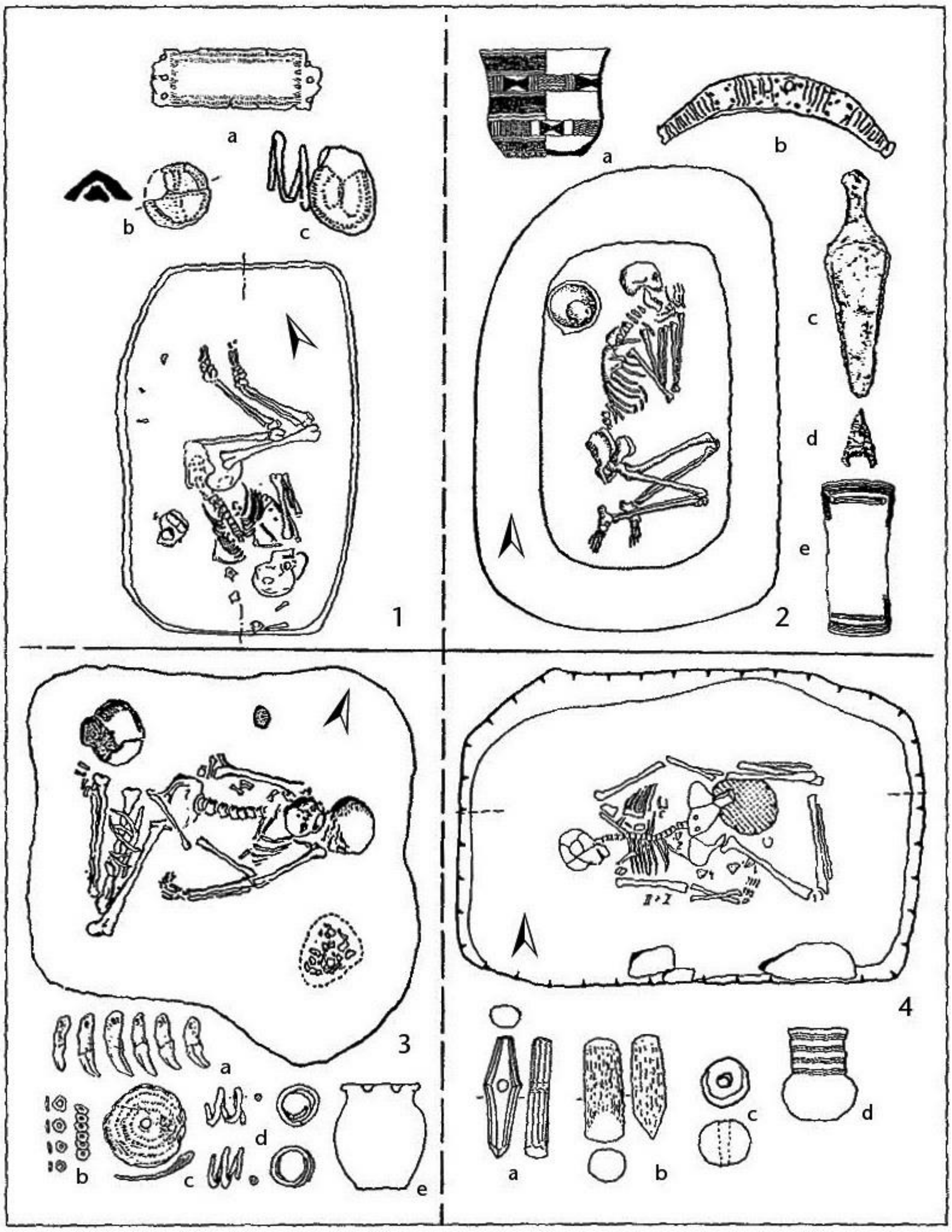


Figure 8.9: Corded Ware and Bell Beaker burial rites. Top: Bell Beaker. Bottom: Corded Ware. Right: male. Left: female (Vandkilde, 2006: Fig. 8.)

variously in terms of age, gender and kinship ties (e.g. Lull, et al., 2005; Sanahuja, 2007; Sánchez Romero, et al., 2007; Sarauw, 2007; Brück, 2009; Sánchez Romero, 2009; Appleby, 2011; Rogers, 2013).

8.6.1 Beaker Period Burial Customs

The burial customs utilized during the Beaker period vary regionally, but this is down to a degree of continuity existing with those of the preceding period in most areas. In Iberia various forms of burial were utilized including single graves which are comparatively rare, megalithic and corbelled tombs, and both artificial and natural caves. In addition to new sites, various Neolithic megaliths and caves (both artificial and natural) were re-used, suggesting a degree of continuity in burial practices (Kunst, 2005: 221-222; García Sanjuán, 2006; Bueno Ramírez, et al., 2008; Aranda Jiménez, et al., 2009; García Puchol, et al. 2013; Garrido Pena, 2014: 119-122). A similar situation is apparent in France (L'Helgouach, 2001; Chambon, 2004; Salanova, 2005; Vander Linden, 2006a, 2012: 77; Salanova and Tcheremissinoff, 2011; Lemercier, 2012a, 2012b; Vergnaud, 2013), Italy and western Switzerland (Besse and Desideri, 2005; Desideri, et al., 2012). A level of continuity is also evident in the burial practices of Central and Northern European areas, where the Late Neolithic Single Grave/Corded Ware Cultures were replaced in eastern Switzerland, Bohemia, Moravia (Turek, 2000, 2004, 2011a, 2011b, 2013a, 2013b; Krutova, 2003; Heyd, 2007a; Mikołajczak and Szczodrowski, 2012: 182-183), the Low Countries (Fokkens, 1999, 2005, 2012a ; Cauwe, et al., 2001; Van der Beek, 2004; Vander Linden, 2012: 76-77), Denmark (Sarauw, 2007, 2008a) and Poland (Budziszewski, et al., 2003; Makarowicz, 2003a, 2003b; Czebreszuk and Szmyt, 2012) as the custom of single burial continued, although there were exceptions (Chapman, 2010). The practice of single inhumation burial appears to have become established as the predominant tradition in Britain (e.g. Case, 1995, 2001, 2004a, 2004b; Thomas 2000; Fowler, 2005; Sheridan, 2008c, 2012: 44-45; Vander Linden, 2012: 77-78) following the adoption of Beaker customs, but there does appear to have been a degree of variety and change over time (Case, 2004b: 195-197; Gibson, 2004, 2007; Needham, 2005: 200-209, 2012: 5-17; Fitzpatrick and Barclay, 2011; Wilkin, 2011; Cleal and Pollard, 2012; Curtis and Wilkin, 2012; Garwood, 2012; Healy, 2012; Shepherd, 2012).

As highlighted by Fokkens (2012a: 30) the 'Beaker Culture' is characterized by both a veneer of recognizable similarity and characteristic regionality in terms of style and paraphernalia and as outlined in Chapter 5 the associated symbolism displays varying levels of continuity and innovation. As the 'Beaker Phenomenon' is generally characterized by high levels of regional cultural continuation and integration of newly introduced symbolism (e.g. Salanova, 2005; Fokkens, 2012a; Mikołajczak and Szczodrowski, 2012; García Puchol, et al., 2013: 271; Wilkin and Vander Linden, 2015: 109) there appears to have been a compatibility between pre-existing ideologies and those encapsulated by the Beaker 'ethos'. Needham (2005, 2012) described this process as the "fusion horizon" in Britain and this concept may be widely applicable to the different regional interpretations of a Beaker 'idea'. Going further it may be advanced that this indicates that the Beaker 'ethos' underpinned a belief system and ideological framework which was negotiated and not only compatible with, but actually reconciled with pre-existing beliefs at various regional and local levels. The 'Beaker complex' appears to display a hybrid ideology – at least in terms of symbolism – as many of the diagnostic features appear to have carried regional or widespread emblematic importance across Europe prior to 'Beaker' emergence, which further suggests a fusion of pre-existing ideological ideas under a new guise. The way in which a particular form of artefact can emerge in one region and become integrated into a supra-regional 'cultural complex' to become a proto-typical 'cultural symbol' has been demonstrated in the case of Late Neolithic 'boat shaped' battle axes in northern Europe (Hübner, 2005; Furholt, 2014: 72-74) and it may be advanced that similar processes were operating during the emergence and spread of the 'symbols' that became 'defining' elements of the 'Beaker complex'. Throughout the Beaker distribution, the most conspicuous and widespread innovations in funerary paraphernalia are the inclusion of (a) particular styles of ceramic vessel; (b) archery equipment (and associated objects); and (c) an increased presence of "exotic" items. In essence, these categories form the essential characteristics of "standardized" funerary practice and a "homogeneous custom" which resonates throughout the "Beaker world" in both communal and individual burial contexts.

In Ireland the Chalcolithic period witnessed the re-emergence of megalithism in the form of wedge tombs, the majority of which are located in western areas. Analysis of available dates suggests that they appeared in both the north and south sometime during the period c. 2540-2300 BC and many appear to have continued in use into the EBA (Brindley and Lanting, 1991-2b; O'Brien 1999a, 2012; Schulting, et al., 2008; Carlin, 2011: 126-135). Another phenomenon which began in the Chalcolithic and continued into the EBA was renewed deposition in Neolithic monuments. Such reuse has been noted among all of the major Neolithic traditions and over 50 instances have been recorded (Carlin, 2011: 135-140; Mount, 2012: 1, 2013: 184-185; Carlin and Brück, 2012: 196-198), including portal tombs (Herity, 1964; Kytmannow, 2008; Lynch, 2014), court tombs (Herity, 1987; Schulting, et al., 2012a), Linkardstown-type monuments (e.g. Brindley and Lanting, 1991-2a; Schulting, et al., 2012a) and passage tombs (e.g. Ó Ríordáin, 1968; Brindley, et al., 2005; Bayliss and O'Sullivan, 2013). The Beaker burials that have been discovered in Ireland are generally not 'classic' crouched inhumations, but fall within the range of practices found elsewhere in Western Europe and include both inhumations and cremations (see Carlin, 2011: 123-171; Carlin and Brück, 2012: 196-199; Mount, 2012; for recent reviews of the available evidence). However, a rare inhumation burial was discovered towards the mouth of the Boyne at Mell where Beaker activity also included occupation features. The partially stone lined grave contained an east-west oriented prone adult female (c. 2490-2200 cal. BC) with legs flexed, head to the west, accompanied by animal bone and two convex scrapers (Figure 8.13; McQuade, 2005: 35-36; Roche and Grogan, 2005a; Mount, 2012: 4). As has been noted (Carlin, 2011: 152; Carlin, and Brück, 2012: 196) this deposition, including the orientation, resembles Beaker burials in northern Britain.

8.6.2 Burial position and orientation

There were somewhat subtle, yet significant differences between Beaker and CWC/SGC burial practices and a notable element of this differentiation was in burial position and orientation suggesting an intentional attempt by Beaker groups to symbolically and/or ideologically segregate themselves (Figure 8.9). In most former CWC/SG areas (Benz, et al., 1998: 308; Müller, 2001: 589; Vander Linden, 2006a; Heyd, 2007a: 331; Sarauw, 2008a: 28; Fokkens, 2012a: 30; Mikołajczak and Szczodrowski, 2012: 183) a defining symbolic characteristic of the Beaker burial rite was the specification of burial position and orientation. These were customarily laid out with the main orientation being north-south with both sexes being interred in foetal positions facing east, with men always on their left side heads to the north, and women on their right heads to the south. These 'standardized' burial positions and orientations mirror or are directly opposite those of the preceding (and contemporary) CWC/SGCs in Central and North-East Europe where males were buried on their right, orientated west and facing south, and women on their left, orientated east and facing south (Benz, et al., 1998: 311; Vandkilde, 2006: 380; Heyd, 2007a: 331; Mikołajczak and Szczodrowski, 2012: 183; Shepherd, 2012: 274).

In Britain, Beaker burial orientation patterns are beginning to indicate a number of chronological as well as the more established geographical distinctions between northern and southern regions. Early burials in Wessex (including the Amesbury Archer and Boscombe Bowmen) were oriented north-west to south-east (Fitzpatrick and Barclay, 2011: 198). This pattern has also been recorded in the Upper Thames area (Sofaer Deverinski, 2002: 201), in east Yorkshire in a minority of early burials associated with (early) AOC Beakers and also occurs among male burials in north-east Scotland, but there is no geographical clustering or discernible Beaker style or decoration uniting them (Shepherd, 2012: 263-264). Furthermore, in east Yorkshire a sub-set of males associated with flint daggers have orientations varying between east and north (Shepherd, 2012: 263). On the continent the same pattern has been observed to be customary in the north-eastern Netherlands (Lanting, 2007-2008: 100; Shepherd, 2012: 274). Another pattern of potentially early chronological position identified in the Wessex area are females (accompanied by Step 2/3 Beakers) buried on their left side heads to the south, facing west, an orientation only previously observed in the Corded Ware tradition (Shepherd, 2012: 275).

In southern Britain (including Wessex) the practice that became customary was for males to be placed on their left side, head to the north facing east and the overwhelming majority of females were interred on their right side with the head to the south facing east (recent discoveries in the Wessex area were accompanied by Wessex/Middle Rhine or related types of Beaker). This tradition is the same as that found in Central/North-East European Beaker areas and in male 'weapon' associated burials in western parts of the Continent (Brodie, 2001: 489-490; Sofaer Deverinski, 2002: 201; Fitzpatrick and Barclay, 2011: 198, 211; Shepherd, 2012: 274-275) and has also been recorded among later Beaker burials in Yorkshire (Shepherd, 2012: 263, 274).

In north(-eastern) Britain the predominant custom to become established was males being interred on their left orientated east and females on their right orientated west, all facing south, the reverse of the gender differentiation found within the CWC/SGCs (Brodie, 2001: 489; Shepherd, 2012: 261-265, 274). Little skeletal evidence survived in the early 'Dutch-style' burials in Scotland so the early establishment of this orientation pattern cannot be confirmed, but the graves are oriented east-west suggesting that the tradition was followed (Shepherd, 2012: 274-275). The same pattern is also found in the central Netherlands (as well as occurring in a minority of burials in the north-eastern part of the country), and similar orientations are evident in Iberia (Salanova, 1998: 317, 2003; Lanting, 2007-2008: 100; Fitzpatrick and Barclay, 2011: 211; Shepherd, 2012: 274). Indications of a further pattern among later Beaker burials in east Yorkshire is beginning to emerge. This sub-group is currently represented by two unsexed burials positioned on their right side with alternate orientations of head to the south facing east and head to the north facing west, but Shepherd (2012: 263) has recognized that these share affinity with patterns identified in the indigenous Food Vessel tradition of the region. In the latter both males and females were customarily placed on their right, east-west orientations with individuals facing south were common, but there were also a minority buried with heads to the south facing east and heads to the east facing north.

8.6.3 New Social Statuses

Societies across Europe at this time may have been experiencing the advent of new social statuses that may have challenged the status quo, but may have also been open to challenge and interpretation. Individual differentiation, be it social, politically or otherwise motivated, is evident among Beaker burials and within cemeteries in the regions in which they have been recorded. At one level differentiation was enacted along relatively orthodox gender lines, with somewhat standardized sets of objects being associated specifically with males and females (Müller, 2001; Budziszewski, et al., 2003; Krutova, 2003: 213-214; Makarowicz, 2003b; Case, 2004a: 22-25, 2004b; Needham, 2005: 200-209, 2012: 5-17; Vandkilde, 2006: 379-381; Heyd, 2007a: 341;

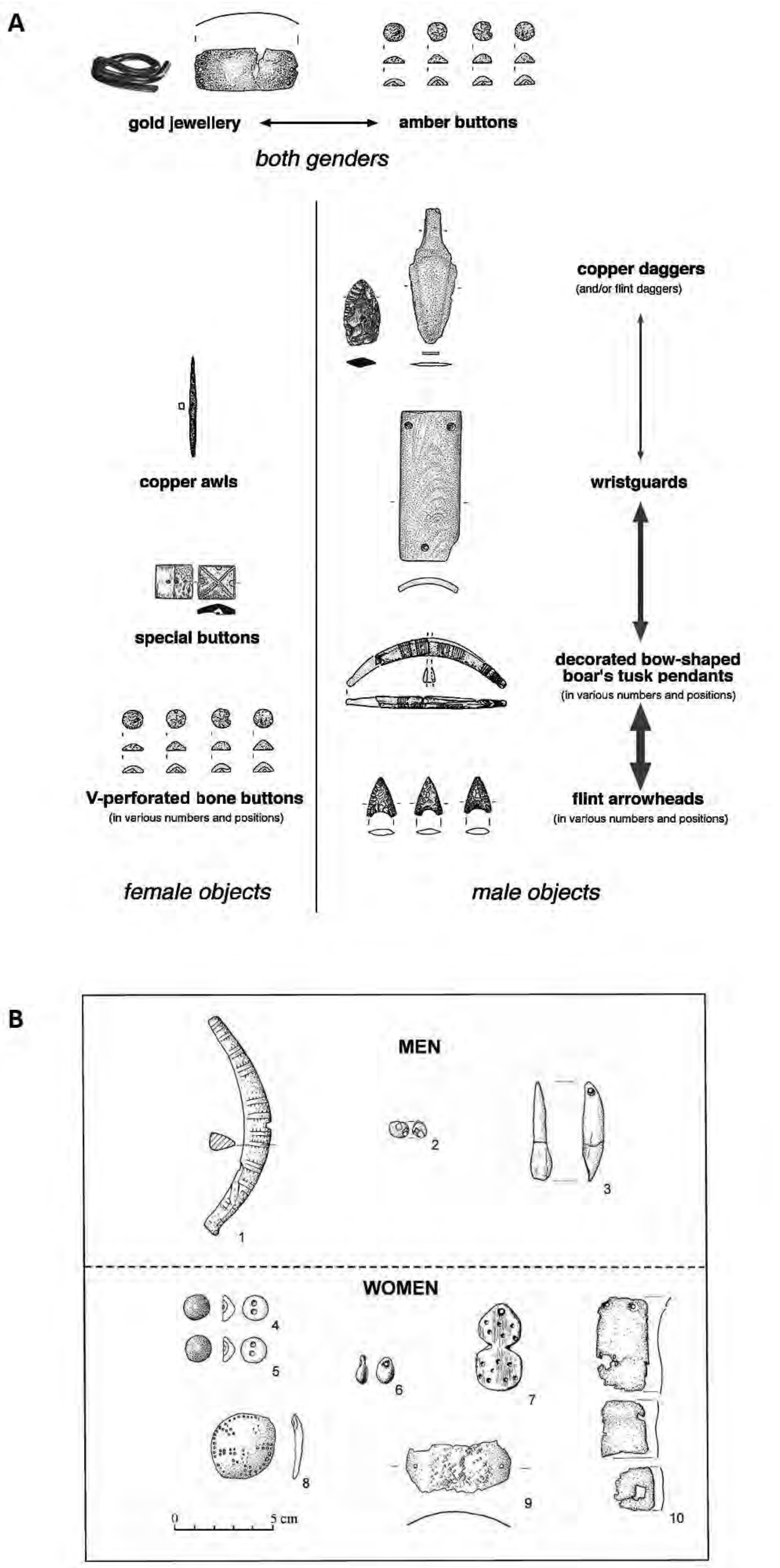


Figure 8.10: Gendered grave goods. Figure 8.7: (A) Gendered grave goods in the Beaker East group (Heyd, 2007a: Fig. 9.); (B) Gendered grave goods in the Polish uplands (Budziszewski, et al., 2003: Fig. 13.)

Moragón, 2011: 55-57; Turek, 2011a, 2011b, 2013b; Wilkin, 2011; Curtis and Wilkin, 2012; Garwood, 2012: 301; Healy: 2012) broadly in terms of 'weaponry', tools and dress accessories, with this treatment also extending to children (Turek, 2000, 2011b, 2013a, 2013b; Case, 2004b: 197; Heyd, 2007a: 352-357; Garwood, 2012: 301; García Puchol, et al., 2013: 272-273).

In addition to Beaker pottery, with some regional variation the material deposited in graves (and/or in 'votive' contexts) includes archery equipment including arrows, 'arrow straighteners' (primarily Central and Eastern Europe) and 'wristguards'; palmela points (essentially limited to Iberia, southern France and North Africa); daggers of copper and flint; copper awls; axes of stone and copper (Western Europe) and axe-shaped pendants (Iberia and southern France); anthropomorphic figurines and 'eyed-idols' (Iberia); v-perforated buttons of varying material (e.g. jet, amber, ivory, bone); various styles of jewellery crafted in such materials as bone and boar tusk (including 'bow shaped' pendants), jet, amber, copper and a variety of forms in gold, (e.g. perforated, discs, lunulae, plaques i.e. diadems or headbands, beads, hair-, temple- or ear-rings, spiral bracelets).

The number of objects deposited is another form of differentiation and a burial may include one item from the 'standardized sets', a combination of elements or even none (Case, 2004a: 22-25, 2004b: 197; Needham, 2005: 200-209, 2012: 5-17; Heyd, 2007a: 335; Moragón, 2011: 55-57; Wilkin, 2011; Curtis and Wilkin, 2012; Healy: 2012; García Puchol, et al., 2013: 271; Garrido Pena, 2014: 120;) and it is feasible that some of the more well equipped examples may represent 'prestige burials', possibly signalling an individuals' influence or reputation in life (Vander Linden, 2006a, 325-326). In terms of social status, another form of differentiation may have revolved around specialization, and craft specialists or artisans, for example, could have been noteworthy figures and some burials may indicate such craft practitioner personae (e.g. Case 1995: 55, 60; Brodie, 1997: 298-311; Makarowicz, 2003b: 148; Turek, 2004; Heyd, 2007a: 360; Fitzpatrick and Barclay, 2011: 212-226).

8.7 'ARCHERY' SYMBOLISM

It has been advanced that Beaker 'archery symbolism' represents one of a series of supra-regional cultural incarnations of a 'warrior' ideal or ideology displayed in burial contexts (Guilaine and Zammit, 2005: 162-167; Vandkilde, 2006; Heyd, 2007a). The earliest evidence in Europe for graves equipped with 'weapons' date to as early as c. 4400 BC in the south-east of the Continent across the western Pontic region, the Balkans, and eastern Carpathian basin (Guilaine and Zammit, 2005: 166, 177-179; Heyd, 2007a: 357-358, 2011, 2012: 104; Horváth, 2009: 116, 118-120, 2014: 524-525). Evidence suggests that around the beginning of the 3rd millennium BC, ideological ideas

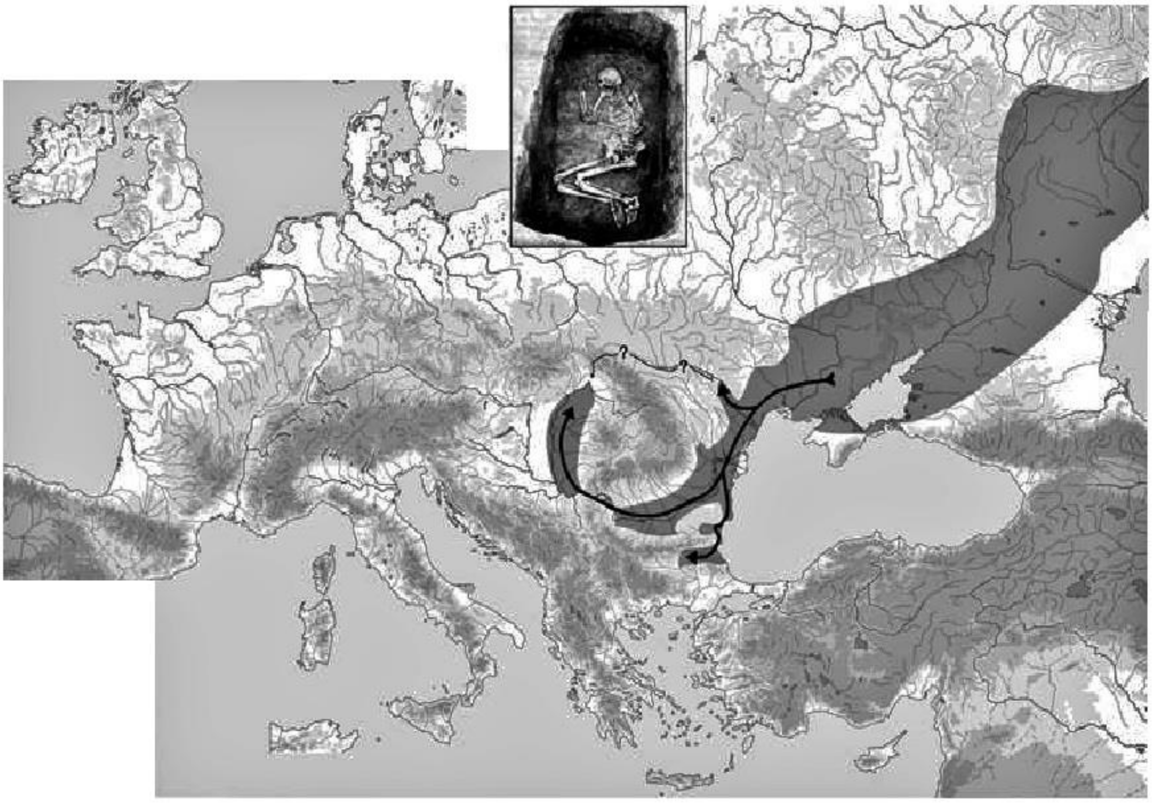


Figure 8.11: Main directions of the Yamnaya migration event c. 3100/2900-2700 BC (Harrison and Heyd, 2007: Fig. 43.)

associated with the deposition of weaponry in funerary contexts spread towards Central and Northern Europe, where they may have played a significant role in the emergence of the Corded Ware complex (Heyd, 2007a: 357-358, 2012: 104; Wencel, 2015), and potentially as far west as the French/Italian Alpine area (Guilaine and Zammit, 2005: 130-132, 162-166, 177-179; Harrison and Heyd, 2007; Horváth, 2014: 524-525; Jeunesse, 2015b). Heyd (2007a: 357-358) argues that this diffusion of ideas involved two primary strands. The first being the adoption of similar styles of grave-goods (emphasis on: stone axes, flint adzes, and amber ornaments displaying solar-symbolism) deposited in both collective and individual graves within the Globular Amphora Culture to the north of the Carpathians, and the second being Yamnaya Culture migration (which emphasised tanged copper daggers among their burial paraphernalia) (Figure 8.11; *ibid*.: 347, 357-358). In this context it is notable that recent isotope (Haak, et al., 2008; Kern, 2012) and aDNA analysis (Brandt, et al., 2013; Allentoft, et al., 2015; Haak, et al., 2015) is beginning to indicate high levels of (potentially large-scale) migration into Central Europe from the Carpathian basin and/or Pontic region during the early 3rd millennium BC, thus supporting the hypothesized connection between the funerary and symbolic practices of the CWC/SGC (emphasis on: stone battle-axes, flint daggers, stone axes) and the Yamnaya.

Figure 8.12: Selection of archery burials from different regions. (A) Reconstruction of an idealised Beaker archer (Heyd, 2007a: Fig. 18.); (B) Archery equipment elements recovered from Beaker burials from northern Jutland, Denmark. 1: Fredsø (Thisted); 2: Rødding (Viborg); 3: Borbjerg (Ringkøbing) (Vandkilde, 2005: Fig. 8.); (C) Archery equipment elements recovered from Beaker graves in the Polish upland. 1: Samborzec, grave III; 2, 6-7: Samborzec, grave X; 3: Złota, Grodzisko II, grave 173; 4-5: Święcice, grave 5; 8-9: Beradź, grave 5 (Budziszewski, et al., 2003: Fig. 9.); Archery equipment elements recovered from Beaker graves in England. 1: Driffied C3l (East Yorkshire); 2: Mere 6a (Wiltshire); 3: Alsop Moor (Derbyshire); 4: Roundway 8 (Wiltshire); 5: Dorchester XII (Oxfordshire); 6: Barnack (Cambridgeshire) (adapted from Case, 2004b: Figs. 1-2.)

As highlighted by numerous authors (e.g. Case 2004a: 22-28, 2004b: 197, 200; Vander Linden, 2004: 39-43, 2006; Needham, 2005, 2012; Heyd, 2007a; Woodward, et al., 2011: 86-107; García Puchol, et al. 2013) the inclusion of particular styles of ceramic vessel and archery equipment, primarily arrowheads and wristguards, and flint or copper daggers, form essential characteristics of “standardized” funerary practice throughout the “Beaker world”. Other common, but more regionally specific, artefacts found in the archery package include palmela points in South-West Europe and North Africa (Case, 2004a: 28; García Puchol, et al. 2013: 271; Garrido Pena, 2014: 120), ‘bow-shaped’ pendants primarily in Central/Eastern Europe (Piggott, 1971; Makarowicz, 2003a: 145, 2003b: 142; Heyd, 2007a: 341; Fokkens, et al., 2008: 213; Růžičková, 2009; Budziszewski and Włodarczak, 2010: 62-63, 150; Fitzpatrick and Barclay, 2011: 59-61), and new styles of belt-ring in Britain (Sheridan and Davis, 2002, 2011; Woodward, et al., 2011: 92-94; Curtis and Wilkin, 2012: 240-241; Sheridan, 2012: 43, 48). The ‘bow-shaped’ pendants have been interpreted variously as pendants, clothing fasteners and quiver-ornaments among other suggestions (Piggott, 1971; Růžičková, 2009: 57-58; Fitzpatrick and Barclay, 2011: 59-61), while the belt-rings are generally suggested to have been developed to stop garments from interfering with bows (Woodward, et al., 2011: 92-94; Sheridan, 2012: 43, 48).

Although ‘classic’ archery graves are not found in Ireland, items commonly associated with such burials have been found (Figure 8.13), including examples within the vicinity of the passage tombs in the Boyne Valley. For example, three barbed-and-tanged arrowheads were recovered from the occupation outside Newgrange 1 (Figure 8.13; Lehane, 1983: 152), another from the western timber circle (Sweetman, 1985: 210) and a hollow-based arrowhead was sealed by slip from the cairn of the destroyed satellite passage tomb Site Z (O’Kelly, et al., 1978: 333). A star-shaped V-perforated button was found within the passage tomb at Dowth (Wilde, 1857: 122; Harbison, 1976: 14) and two barbed-and-tanged and one hollow-based arrowhead were found within the occupation deposits focused around Knowth 1 (Eogan, 1984: 245-322, 331-346; Eogan and Roche, 1997: 223-255; Roche and Eogan, 2001).

Similar evidence has been found at a number of other passage tombs in the eastern half of the country. To the north of the Boyne Valley, a small number of Chalcolithic finds were discovered within the Loughcrew (Meath) complex (Carlin, 2011: 138-140), including an unperforated jet button and a barbed-and-tanged arrowhead within cairn R2 (Coffey, 1896: 32; Harbison, 1976: 14), a barbed-and-tanged arrowhead in cairn U (Buick, 1895: 59) and a possible flint wristguard (Type B2) in the topsoil within 400m of cairn K (Carlin, 2011: 139). Further north, a barbed-and-tanged arrowhead was recovered from the passage tomb on the summit of Slieve Gullion (Armagh) (Collins and Wilson, 1963; Carlin, 2011: 140). To the south of the Boyne Valley, three v-perforated buttons were discovered within the chamber of the Mound of the Hostages passage tomb at the Hill of Tara (Meath) (Carlin, 2011: 138-139). Their original associations are unclear, but two were found within and close to an Early Bronze Age burial (Burial 18) respectively

Figure 8.13: Archery equipment and v-perforated buttons in Ireland.(A) The distribution of bracers in Ireland (Carlin, 2011: Fig. 9.21.); (B) The distribution of tanged copper daggers in Ireland. Examples provenanced to county are represented by open symbols. (Carlin, 2011: Fig. 9.22.); (C) The distribution of v-perforated buttons in Ireland (Carlin, 2011: Fig. 9.19.); (D) Barbed-and-tanged arrowheads from Newgrange (O'Kelly, 1983: Fig. 64); (E) Type A bracer found at Fourknocks (Carlin, 2011: Figure 5.13); Female inhumation burial at Mell (Carlin, 2011: Figure 5.22.)

(O'Sullivan, 2005: 104-110), but may originally have been associated with cremated human bone from the base of the pit dated to c. 2393-1983 cal. BC (Brindley, et al., 2005: 290). To the east of the Hill of Tara, north of the River Devlin, evidence for a Beaker presence on the Fourknocks (Meath) ridge alongside the passage tomb, Late Neolithic occupation and possible timber circle included a tanged arrowhead and a broken siltstone wristguard (Type A2) (Figure 8.13; King, 1999: 172-173; Carlin, 2011: 139). To the south, east of Waterford Harbour around Tramore Bay three barbed-and-tanged arrowheads were recovered from the passage tomb (or related monument) at Harristown (Waterford) (Hawkes, 1941; Green, 1980: 412, 417; Carlin, 2011: 133).

In addition to these passage tomb associated finds, two hollow-based arrowheads were recovered from a portal tomb at Kiltiernan (Dublin) beside one of the tributaries of the Shanganagh/ Carrickmines River (Ó Eochaidhe, 1957; Carlin, 2011: 141) and archery equipment was interred within two possible cremation burials in Co. Kildare. The first, a cist burial marked by a standing stone at Furness contained a flint flake, three fragments of a trachyte wristguard (Type A2), a possible disc bead, three Beaker sherds and the cremated remains of two adults, a male and a possible female (Macalister, et al., 1913; Carlin, 2011: 145; Carlin and Brück, 2012: 196). The second, a possible pit burial at Corbally contained unidentifiable cremated bone, Beaker sherds, a thumbnail scraper and a barbed-and-tanged arrowhead (Purcell, 2002: 33; Carlin, 2011: 153; Mount, 2012: 3).

In the eastern half of the country, archery-paraphernalia appears associated with cremations and in close association with megaliths. In the case of the latter, in at least a number of instances these items were discovered within the monuments, while some of those found in external locations may have originally been deposited internally and subsequently removed, others were clearly associated with activity focused around them, but these close associations also appear significant. Although the focus is on the east of the country in the current study, similar 'archery equipment' associations are evident elsewhere, including at a double-cist at Kinkit (Tyrone), Ballywholan court tomb (Tyrone), a burial at Drumstaple (Derry), Carrowmore 49 (Sligo), a bog-find close to Carrowkeel (Sligo), and a potentially disturbed burial in the hilltop enclosure at Longstone (Cullen) (Tipperary/Limerick) (Wood-Martin, 1888: 68; Watts, 1960: 115; Danaher, 1973; Glover, 1975; Harbison, 1976: 7, 14, 24; Carlin, 2011: 138, 146, 199, 253-254).

Outside Ireland, exceptionally furnished 'archery' graves sometimes occur (Figure 8.14), such as at Fuente Olmedo (Valladolid) where a tumulus burial included three native Iberian Ciempozuelos style vessels, a gold diadem, a wristguard, a flint arrowhead, a tanged copper dagger and eleven copper Palmela points (Delibes De Castro, 1977: 62-68) or that of the 'Amesbury Archer'

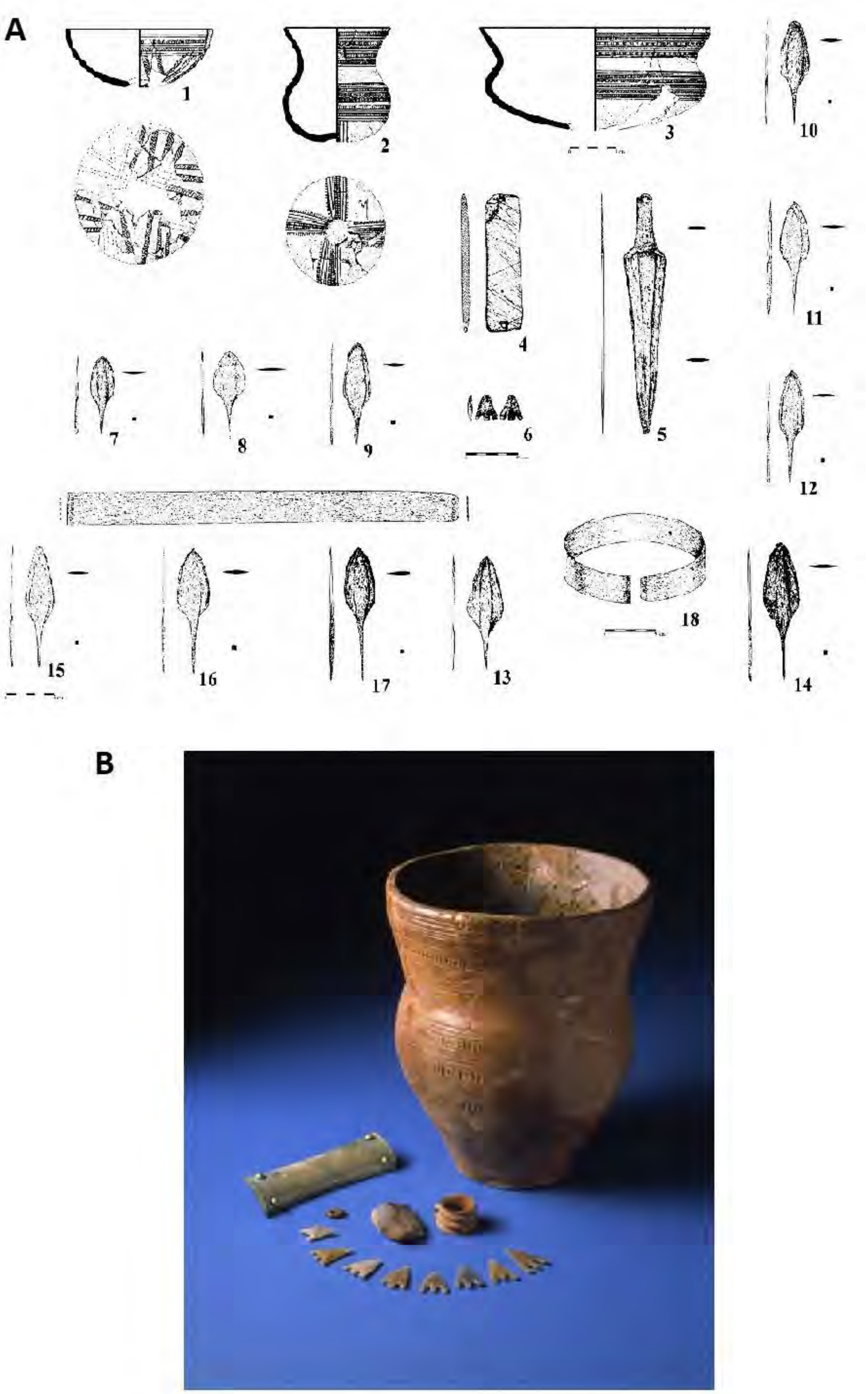


Figure 8.14: Exceptionally furnished 'archery' graves. (A) Fuente Olmedo (Valladolid) Spain (Garrido Pena, 2006: Fig.7.4.); (B) Culduthel (Inverness) Scotland (National Museums Scotland, no date)

(Wiltshire) discovered near Stonehenge in southern England with three copper daggers, two small gold hair tresses, two wristguards, 16 barbed and tanged arrowheads and five pottery vessels (Fitzpatrick, 2002, 2003, 2009; Fitzpatrick and Barclay, 2011). It is also interesting to note from an Irish perspective, that isotopic analysis suggests that an adult male (c. 2280-2030 cal BC) buried with archery equipment at Culduthel (Highland), south of Inverness in Scotland, was probably from north-eastern Ireland. The grave goods included a beaker pot, a flint 'strike-a-light', an amber bead, a Langdale tuff bracer with gold capped copper rivets, a bone belt-ring, and eight barbed and tanged flint arrowheads (Clarke, et al., 1985: 170, 173-174, 267; Woodward and Barclay, 2011: 148; Sheridan, 2012: 48).

The 'Amesbury Archer', buried under a barrow on Boscombe Down, was a powerfully built 35-40 old-year male and a migrant, believed to have been from the Alpine foothills of Germany (Switzerland or Austria) (Evans, et al., 2006; Fitzpatrick and Barclay, 2011) suffered from a large dental abscess which had made a hole in his jaw-bone and was missing his left kneecap and as a result had a severe limp. In fact it would have been impossible for him to fully extend the leg and as a consequence he would have had to swing his injured leg around the side of his body in order to walk (McKinley, 2011). Initially there was an inference that this individual was an aristocratic elite, possibly a chief or even a "king" based upon the number and quality of the grave goods (Fitzpatrick, 2002), but this interpretation was subsequently revised and more recently it has been proposed that he may have been a craftsman, potentially a metalworker (Fitzpatrick, 2009, Fitzpatrick and Barclay, 2011). However, this second interpretation has also been contested and it has been advanced (Westermann and Kanstrup, 2007: 26, 29) that he was primarily presented in a "warrior persona" and that the objects placed around him in the grave, including the Beaker pottery, signified his 'status' or 'prestige' and his "influence over various craftsmen". These interpretations rely on a possible connection between this individual's life and his burial persona, but the question must surely be asked if an individual with such restricted mobility and constant and severe pain would have held such a position of authority?

In not dissimilar circumstances Thomas (1991: 35) has suggested that this may not have been the case. One of the burials in a flat cemetery at Borrowstone, Kingswells in Aberdeen eastern Scotland contained an individual buried with bow and wristguard who suffered from pronounced ankylosis of the spine. Thomas (*ibid*.) concluded that this individual could not have been a warrior and the artefacts represented an 'idealized' burial persona exclusively rather than being associated with the reality of the lived identity of the deceased. It is also interesting to note that in Britain, where evidence is available, many of the males buried with archery equipment were comparatively "elderly" (Thorpe, 2013: 596) and such individuals holding positions of authority or leadership would appear logical. As noted by Garwood (2012: 301) the ‘standardized’ assemblages may point to a “warrior ethos” as argued by Heyd (2007a: 357-358), but the idea that these represent members of a distinct warrior elite is certainly debatable, yet a warrior/archer “persona” (Case 1995: 55, 60, 2004a: 29, 2004b: 200; Brodie 1997: 298-311) of some description is at the very least evoked.

There are also a small number of typologically early Beaker graves in which females were buried with ‘mixed gender’ assemblages in Central/Eastern Europe. Three of these individuals were buried in chambers surrounded by a circular ditch with equipped with archer’s wristguards and miniature copper daggers in addition to more ‘typical female objects’ (Krutova, 2003: 213; Fitzpatrick and Barclay, 2011: 211-212; Turek, 2011a, 2011b, 2013b). The most well-furnished of these was discovered at Tišice (grave no. 77/99; Bohemia). This woman was accompanied by two stone wristguards, a miniature copper dagger, a copper awl, an amber bead, two gold hair ornaments and six vessels (including four decorated Beakers). These women have been interpreted (Turek, 2011a, 2011b, 2013b) as representing members of a social elite, possibly female warriors or “Beaker Amazons”.

A more nuanced interpretation has been advocated by Fokkens (1999, 2005, 2012a: 30, 2012b: 116, 120-123; et al., 2008), who has argued that these archery-associated personae represent consciously constructed identities of ‘exemplary’ ancestors connected with a European wide ‘understanding’ of how the dead should be represented. Case (2004a: 29, 2004b: 200) was one of the few to suggest a specific role for these ancestors in death and an associated symbolic significance to the underlying ‘ethos’ and its associated ‘mythology’. He proposed that these ancestors were deployed to protect the living from malevolence from the spirit world and engaged in otherworldly ‘hunting’ of animals, human foes, and perhaps ‘monsters’ or ‘demons’. He suggested that the ‘symbolic’ hunting equipment which accompanied the deceased would be ‘employed’ in this context with the projectiles serving to kill the quarry, the knife to cut its throat, and the beaker to drink its blood.

8.7.1 Function and meanings of Beaker pottery?

Decorated Beaker ceramics represent the strongest ‘unifying’ link between communities across regions within the ‘culture’ (Kohring, 2011) being found variously in domestic settings, surface scatters, and both ceremonial and funerary contexts (e.g. Shennan, 1976, 1977; Case, 1995, 2001, 2004a, 2004b; Brodie, 1997, 2001; Hurtado Pérez, 1999; Czebreszuk, 2003a; Cardoso, 2004, 2014; Salanova 2004; Vander Linden, 2004, 2006a, 2007a; Besse and Desideri, 2005; Vandkilde, 2005, 2007; Garrido Pena, 2006, 2014; Rojo Guerra, et al., 2006, 2008; Garrido Pena, et al., 2011;

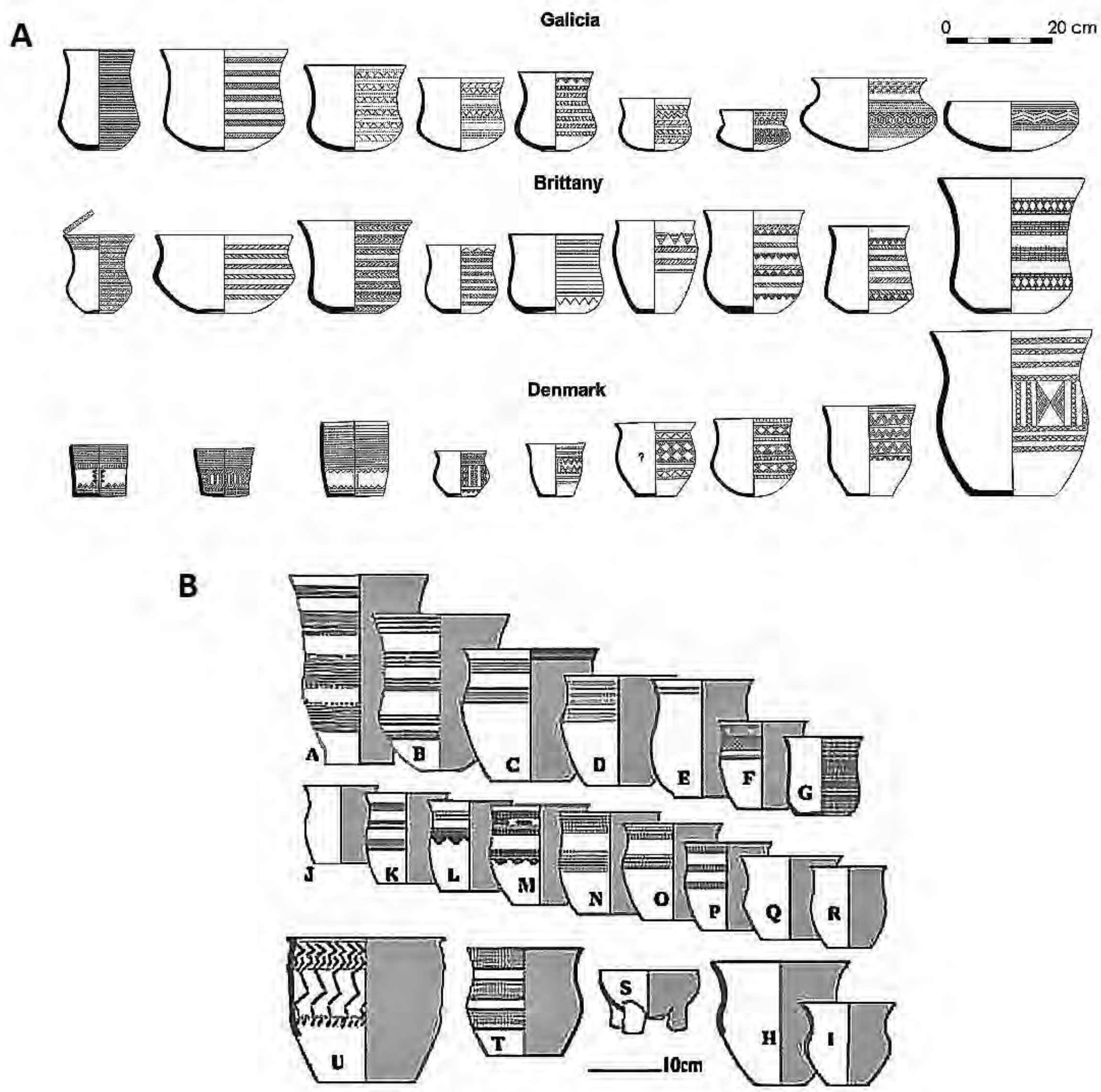


Figure 8.15: Beaker pottery. (A) The stylistic uniformity of the European Bell Beaker style shown based on a selection of funerary vessels from Galicia, Brittany and Denmark (Prieto-Martínez, 2011: Fig. 4.2.); (B) Illustration of different styles of Irish Beaker pots (Carlin, 2011: Fig. 9.1.)

Kohring, 2011; Czebreszuk and Szmyt, 2012). Nevertheless, local sub-types exist within this milieu, with regional styles often being differentiated on the basis of ornamental technique, the organization of designs and variability in form (Figure 8.15; e.g. Boast, 1995, 2002; Case, 1995, 2001, 2004a; Mizoguchi, 1995; Salanova, 2001, 2004, 2008; Czebreszuk, 2003a; Liversage, 2003; Cardoso, 2004, 2014; Vander Linden, 2004: 44-48, 2007a; Lemercier, et al., 2007; Besse and Desideri, 2005; Needham, 2005; Vandkilde, 2005, 2007; Endrődi and Pásztor, 2006; Piguet and Besse, 2009; Kohring, 2011; Prieto-Martínez, 2011; Czebreszuk and Szmyt, 2012). In general terms, to varying degrees populations that became Beaker-using adopted a series of new ceramic forms, motifs and decorative techniques (which didn't exist within most native repertoires) and

Cardoso (2004: 153) suggests that these local and regional stylistic variations demonstrate varying levels of communal integration and negotiation within the wider ‘global trend’ (Figure 8.15). Fokkens (2012a: 31) reached a similar conclusion noting that Beaker pottery was both adopted in many different cultural environments and that it appears that even “vague copies” incorporating Beaker decoration and/or form(s) appear to have sufficed in terms of demonstrating collective or communal affiliations with a “new identity”. Others (e.g. Sarauw, 2008a: 31-32; Kohring, 2011: 150) have highlighted the local/regional variations in style, assemblages and contexts of use to emphasize the fact that the ceramics are likely to have carried a combination of generalized and more subtle or specific meanings, including intrinsic references to the practices which they were associated. As such, at local levels the symbolism and connotations of Beakers may have included aspects that were simultaneously and/or contextually directed externally towards outsiders on one hand and internally towards other members of a given community on the other (Sarauw, 2008a: 31). The associations that these ceramics had could have been varied, but connections with consumption and commensal activities may have been among the most conspicuous.

However, not all Beakers were utilized in, or associated with, consumption and some were associated with ‘industrial’ activities and contexts. For example, in Iberia Beaker pottery has been recovered at a significant ‘salt production’ site Molino Sanchón II (Zamora) in association with briquetage which was used for extracting salt from seawater (Guerra Doce, et al., 2011). A close association between Beaker pottery and metallurgical processing has also been demonstrated with vessels having been found at such sites as the mining camp of La Loma de la Tejería (Teruel) (Rodríguez de la Esperanza and Montero Ruíz, 2003; Guerra Doce, 2006: 252; Montero Ruíz and Rodríguez de la Esperanza, 2008) and in close association with metallurgical processing at various locations including the settlement sites of Zambujal (Torres Vedras) and El Ventorro (Madrid) (Kunst, 1987: 188-189, 592; Priego and Quero, 1992; Garrido Pena, 1997: 198; Guerra Doce, 2006b: 252-253). At the latter site the copper slag was discovered on their interior of two crucible sherds with Beaker-style decoration (Garrido Pena, 1997: 198; Guerra Doce, 2006b: 252) and similar evidence for the use of Beaker pottery as reduction pots to smelt copper ores has also been recorded at a number of other Iberian sites (see Guerra Doce 2006b: 252-253, and references). In an Irish context, both Beaker pottery and evidence for ore processing were found within the ‘work camp’ adjacent to the copper mines at Ross Island (Kerry) (O'Brien, 1995, 1999c: 38-39, 2004: 155-303, 2007: 21-24, 2015: 127, 129; Brindley, 2004; Northover, 2004). It is certainly feasible that connections with ‘industrial’ activities could have been among the contextually-dependent symbolisms associated with Beaker vessels.

Figure 8.16: Beakers and Feasting. (A) Representation of an elit/warrior wearing elements of the Beaker set (Garrido Pena, 2014: Fig. 1.); (B) Origin of the handled pitcher in the Final Neolithic and diffusion in the Bell Beaker culture (Piguet and Besse, 2009: Fig. 2 4.); (C) Ritual scene of a hospitality banquet with Beaker pottery (Garrido Pena, 2014: Fig. 7.); Ciempozuelos Beaker 'trio' (Bueno Ramírez, 2010: Lám. II.)

Traditional interpretations of Beaker ceramics have tended to connect them with 'elite' consumption activities (Figure 8.16; e.g. Clarke, 1976; Shennan, 1976; Harrison 1980; Sherratt, 1987). In recent decades consideration of the symbolic meaning of Beakers in connection with consumption and feasting has perhaps been most systematic and dynamic in Iberian contexts (Figure 8.16). Although some authors have continued to follow traditional 'elite' interpretations (e.g. García Sanjuán and Hurtado Pérez, 1997; Hurtado Pérez, 1999; Garrido Pena and Muñoz López-Astilleros, 2000), questions have been raised about the widespread applicability of this model (e.g. Case, 1995; Brodie, 1997; Kohring, 2011). Notwithstanding, the presence of Beaker pottery both in settlement and funerary settings suggests that commensal activities took place in various contexts and that some type of ceremonial practices linked the dead with the world of the living, perhaps in the form of funerary feasting (Figure 8.16; Garrido Pena, 2006: 86-88; Rojo Guerra, et al., 2006, 2008; Garrido Pena, et al., 2011: 120-124; García Puchol, et al., 2013: 272). Sherratt (1987) was the first to broach the subject of a possible connection between Beaker pots and the consumption of alcohol and developing the idea further, more recently it was hypothesized (Garrido Pena and Muñoz López-Astilleros, 2000) that these alcoholic beverages could have been combined with hallucinogenic substances. The potential links between Beakers and alcohol has even led to the question as to whether they represent the evolution of alcohol-induced martiality and associated 'hooliganism' (Fokkens, 2012a: 30), but the likelihood of such an actuality is rather improbable. Connections with both altered states of consciousness and perhaps by extension communion or communication with the 'Otherworld', and allusions to various 'types' of communal gathering, appear more likely to have been among the activities and symbolization implied by Beaker vessels than alcohol fuelled violence.

Analysis of Iberian Beaker vessel capacities and forms suggested that vessels were variously utilized for the consumption of beverages, storage and/or brewing, and for serving solid foods (Garrido Pena, et al., 2011: 113-117). Beer residues have been identified in samples of both Early Neolithic and Beaker pottery from numerous Iberian sites (Guerra Doce, 2006b: 249-251; Rojo Guerra, et al., 2006; Garrido Pena, et al., 2011: 111) and these finds include wheat beer discovered in a Beaker decorated storage vessel, at the Carlos Álvarez rock-shelter (Soria) (Rojo Guerra, et al., 2008) and it has been advanced (Garrido Pena, et al., 2011: 111) that such large storage pots may have been utilized in brewing activities. Residue indicating a beer mixed with a hallucinogen (hyosciamine) was identified in a Maritime Beaker from a sepulchral cave at Calvari d'Amposta (Tarragona) (Guerra Doce, 2006b: 249; Rojo Guerra, et al., 2006: 253). Other alcoholic beverages have also been identified in Iberian contexts including mead in a plain vessel from a secondary chamber of a rock-cut tomb at Valle de las Higueras (Toledo) (Guerra Doce, 2006b: 250-251; Garrido Pena, et al., 2011: 111) and possible alcoholic beverages made from pear and dairy products mixed with wheat in vessels from the Dolientes I settlement (Soria) (Rojo Guerra, et al., 2006: 251-252; Garrido Pena, et al., 2011: 111). In addition to alcoholic beverages, animal bones have occasionally been discovered in association with burials (e.g. García Puchol, et al., 2013) and ceramics containing food residues have also been positively identified in funerary contexts. The latter includes a small plain carinated bowl from a grave at La Sima (Miño de Medinaceli) which contained animal fat (Rojo Guerra, et al., 2006: 251), which was also identified in a Beaker bowl and two undecorated vessels from the tomb at Valle de las Higueras (Toledo) in addition to a plain plate which once held fish (Guerra Doce, 2006b: 251-252; Garrido Pena, et al., 2011: 111). In addition to evidence for alcohol, these finds connect Beaker pottery further with communal gatherings, commensal activities and in all likelihood funerary feasting (Garrido Pena, 2006; Rojo Guerra, et al., 2006, 2008; Garrido Pena, et al., 2011; García Puchol, et al., 2013).

At regional levels, and particularly identifiable within predominantly single grave-using areas of the Beaker complex, it is evident that in these funerary contexts the pottery was involved in the display of social identities. Although individual differentiation, be it social, politically or otherwise motivated, is evident among Beaker burials and within cemeteries, the ceramics themselves do not appear to have served primarily or solely to have articulated social positions or prestige (Shennan, 1977: 56; Brodie 1997). Rather, the social identities to which they were connected may have been primarily those connected with age and gender. For instance, it has been demonstrated that in Britain vessel volumes and shapes differed in male, female and child burials (Boast, 1995; Case, 1995; Mizoguchi, 1995; Brodie, 1998; Shepherd, 2012: 265-273). In Bohemia and Moravia gender difference appear to have been displayed by different means. In general terms, Beakers pots appear to be more common in male graves, but female graves often contain more coarse ware vessels than those of males (Shennan, 1977: 53; Turek and Cěrný, 2001: 606). Furthermore, in these regions the Beaker pots also appear to have displayed gender through a combination of volume, form and decoration and in the case of one handled vessels particular forms of plastic ornament occur exclusively on pots deposited in either male or female burials (Turek, 2011b: 79).

8.7.2 Function and meanings of daggers?

Two dagger forms were in use within the Beaker distribution (Figure 8.17), the curve-bladed style with its origin in Neolithic France and the straight-bladed design, copper versions of which were most frequent in western Europe (including Ireland), disseminated from the CWC of southern Germany/eastern Switzerland from earlier southern Alpine (Italian) Neolithic proto-types (Apel, 2001; 248-51; Case, 2004a: 25-26; Needham, 2005: 177; Heyd, 2007a: 344-347; Skak-Nielsen, 2009: 350). Numerous scholars (e.g. Vandkilde, 2005: 10, 2006: 394; Randsborg, 2006: 43; Thrane, 2006: 492) have postulated that copper and flint daggers were intended to be weapons for close combat. However, doubts have been raised about this interpretation and a variety of alternative uses have been advanced (e.g. Stensköld, 2004: 99, 217-18; Fowler, 2005; Harding, 2006: 506-507; Aranda Jiménez, et al., 2009; Skak-Nielsen, 2009). Following a review of use-wear analysis, Skak-Nielsen (2009: 351, and references; see also Heyd, 2000 for further references) suggests that they were primarily used for cutting and in terms of being utilized for stabbing (Skak-Nielsen,

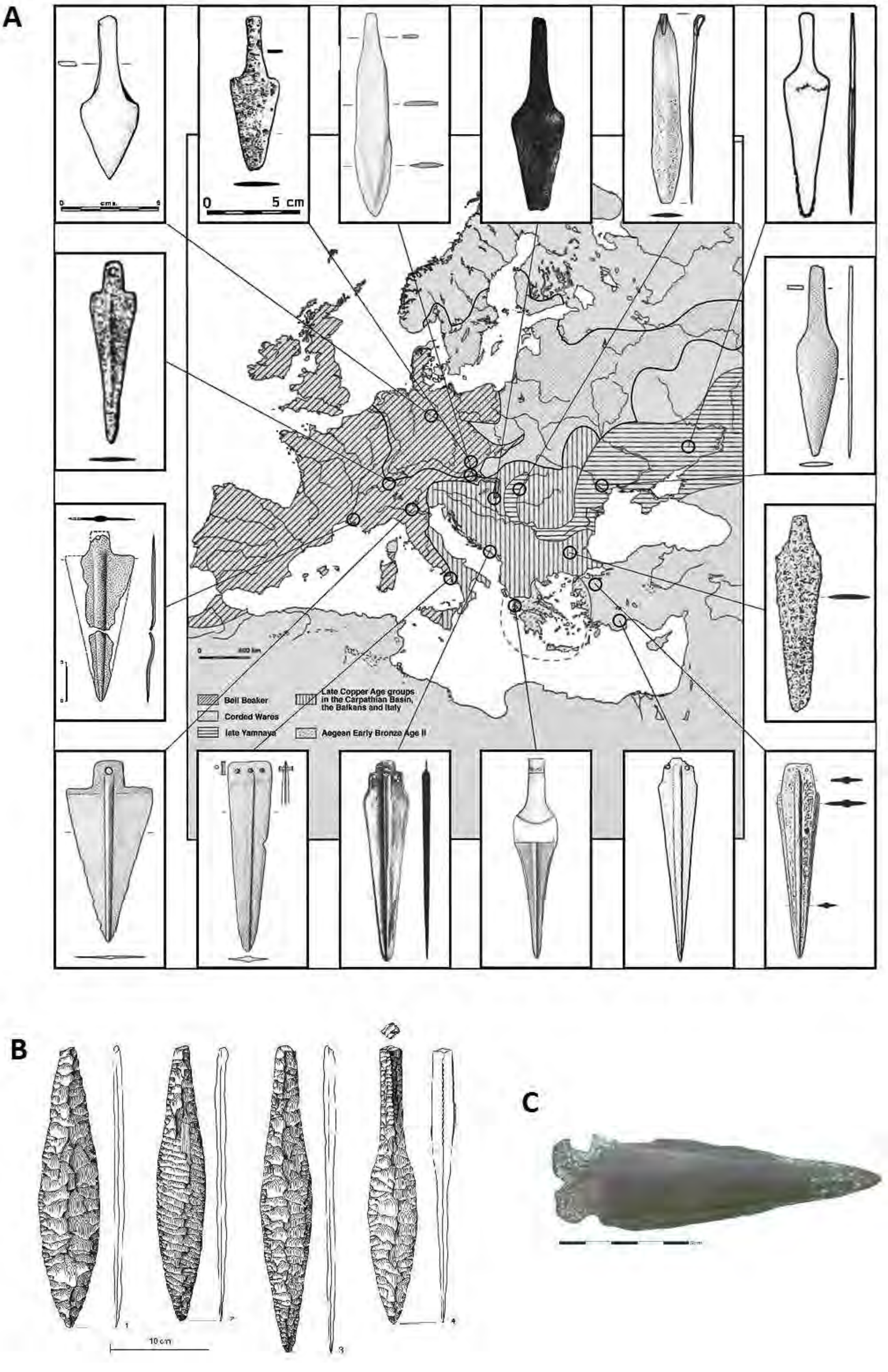


Figure 8.17: Daggers. (A) Main pre-Beaker dagger types of the 3rd millennium BC and their schematic distribution in Europe (Heyd, 2007a: Fig. 11.); (B) Danish flint dagger sub-types (Vandkilde, 2005: Fig. 2.); (C) Tanged copper dagger from Whitespots, Co. Down (Ireland) (Becker, 2006: Fig. 25.)

2009: 354), these objects would have been most suited to being thrust in downward or upward motions rather than horizontally. He concluded (*ibid*. 357) that daggers, be they of flint, copper or bronze, could have been used primarily in the despatch of cattle or other livestock in contexts of slaughter and/or sacrifice. Another interesting hypothesis is that they could have been utilized in cutting umbilical cords (Fowler, 2005: 354).

There are also some high-quality flint daggers that would have been purely symbolic items (or to put it another way, finely worked flint objects that were crafted to resemble enlarged daggers aesthetically), as they lacked practical functionality (Apel, 2001: 313-319; Sarauw, 2007: 74). These blades were significantly longer than the average flint daggers (c. 14-15 cm) and maximum lengths reach c. 44 cm, the same length as some of the first sword blades made of bronze. A similar argument for a lack (or at least limited amount) of functionality could perhaps be advanced for the miniature copper daggers found with females in Central Europe (Krutova, 2003: 213; Turek, 2011a, 2011b, 2013b). In the case of the former the “oversized ‘decorative’ specimens”, are perhaps comparable to the oversized and ‘useless’ MBA swords such as the Ommerschans-Plougrescant type, which were never intended for combat (see Fontijn, 2003, 2007), and the oversized Dutch TRB flint axeheads (Wentink, 2006).

8.7.3 Function and meanings of ‘wristgaurds’?

The potential functionality of the highly crafted and polished stone wristguards/bracers has been examined from a number of perspectives. For instance, it has been demonstrated that use in falconry is unlikely (Woodward, et al., 2011: 126-130; Wallis, 2014). Use-wear analysis of British wristguards (Woodward, et al., 2006, Woodward, et al., 2011: 74-85) has shown that some display evidence for wear and damage, but many were ‘fresh’ when deposited suggesting that at least some had been crafted specifically for funerary occasions. Examination of their position in British and Central European graves (Fokkens, et al., 2008) has shown that in funerary contexts at least they were generally worn in an ornamental position, perhaps attached to a leather backing (Figure 8.18). Certainly the four-holed variety, a small number of which have been recovered in Ireland, are frequent in Britain and most common in Central Europe and the Lower Rhine region (Harbison, 1976; Woodward, et al., 2006, 2011; Fokkens, et al., 2008) could have been worn functionally, but a more symbolic and less functional interpretation has been suggested (Fokkens, et al., 2008; Woodward, et al., 2011; Turek, 2015). However, as concluded by Fokkens et al. (2008) the two-holed style (as well as the single-holed variety), which have a generally Atlantic-Mediterranean distribution, being found in Ireland, Britain, France, Iberia and Morocco (Figure 8.18; Harbison, 1976; Harrison and Gilman, 1977: 93-95; Harrison, 1977: 39-42, 1980: 157-158; Case, 2004a: 26, 28; Fokkens, et al., 2008) would have been impractical as functional items and

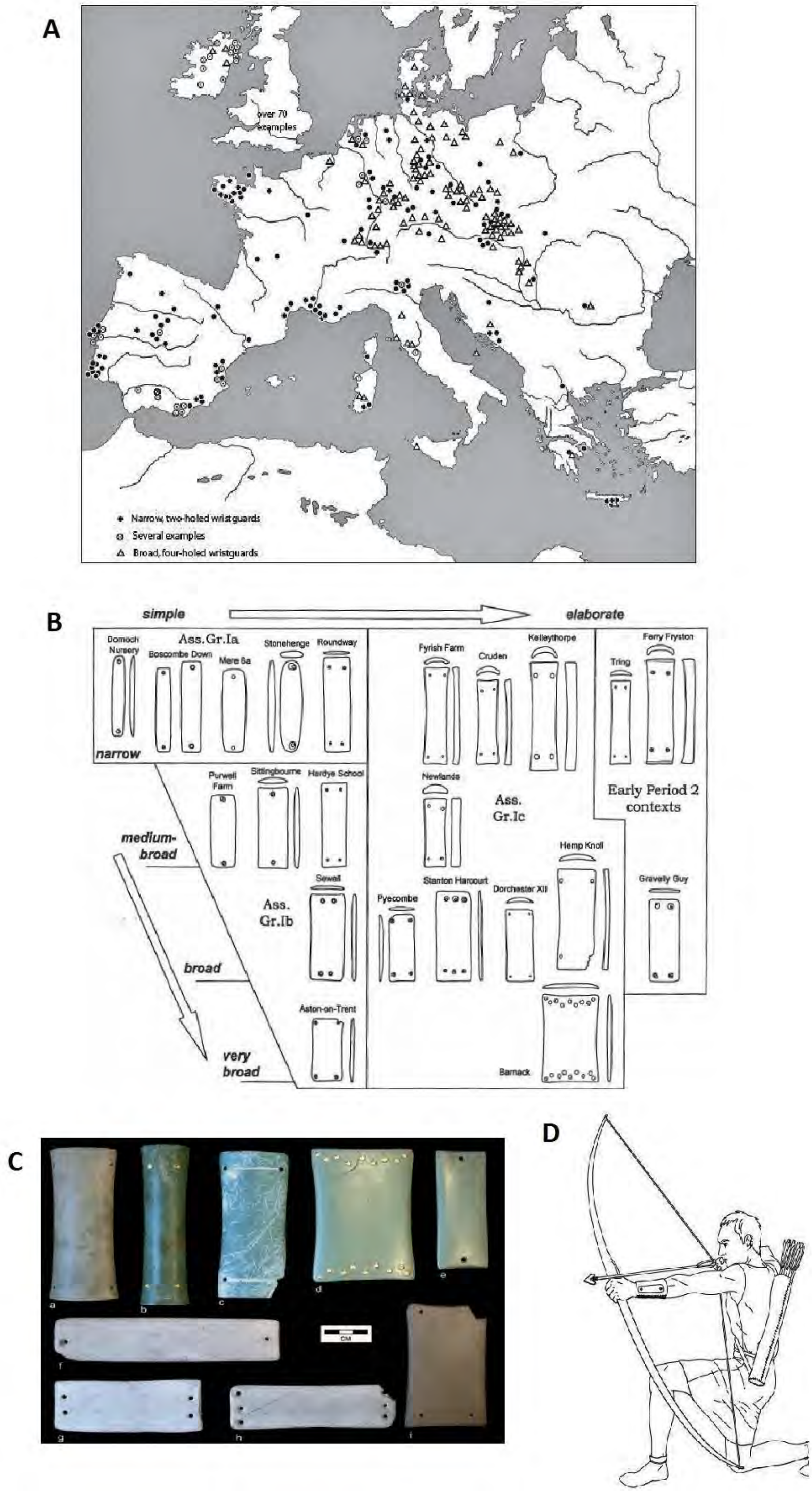


Figure 8.18: Bracers/Wristguards. (A) Distribution of bracers/wristguards in Europe (Rahmstorf, 2008: Fig. 7.); (B) Variation in bracer form in Britain (Needham, 2012: Fig. 1.2.); (C) Representative range of bracer types and lithologies in Britain (Woodward, et al., 2006: Fig. 2.); (D) Possibly the most common way of wearing stone wristguards (Fokkens, et al., 2008: Fig. 10)

must have had a more decorative, symbolic or evocative application as objects of display. In this context, although it is not possible to elaborate on the proposition, it may be notable that Case (2004a: 26) suggested that a relationship may have existed between the bracer form and that of Iberian schist/slate plaques, undecorated examples of which were similarly perforated.

Analysis of typo-chronological development in Britain (Figure 8.18) suggests they became more elaborate over time with flat narrow bracers evolving into both broad and plano-convex sectioned forms (Woodward, et al., 2011: 46-59; Needham, 2012: 12-13) and that in at least some instances specimens were made of materials which were 'highly prized' during the Neolithic, such as Langdale tuff from Cumbria (Woodward et al. 2006, 538, 2011: 19-45, 116-119; Needham, 2012: 12-13; Sheridan, 2012: 48). The ornamental nature of these items is not only indicated by the materials utilized, their craftsmanship and highly polished finishes but also by exceptionally elaborate examples. For instance, a small number of British specimens with gold rivet-caps (Figure 8.18; Woodward, et al. 2006: 541, 2011: 70, 73, 80; Needham, 2012: 12-13; Sheridan, 2012: 48; Needham and Sheridan, 2014: 909) and an exceptional gold wristguard was found at Vila Nova de Cerveira (Viana do Castelo) in Portugal (Garrido Pena, 2014: 116).

8.8 ARCHERY AS A PRACTICE - HUNTING

The employment of archery as a practice has been debated by various scholars (e.g. Sarauw, 2007; Fokkens, et al., 2008; Sosna, 2012; Schulting, 2013; Piqué, et al., 2015) and it appears to have varied during the Beaker period across Europe. It has been suggested (Oeggl, 2009; Piqué, 2015) that prehistoric bows would have been employed for several purposes as their manufacture would have entailed significant labour investment and the requisite accessibility of suitable raw materials. In addition, analysis of Neolithic bows in Iberia (Figure 8.19; Piqué, 2015: 171, and references) has indicated that a variety in shapes and sizes were utilized and that these variations related to specific functional differences rather than chronological developments. As such, these differences appear to indicate the intentional manufacture of bows intended for predetermined purposes and contrasting utilization, on the one hand for hunting and on the other engagement in violence and hostilities. Piggott (1971: 89-92) argued that the Beaker 'bow-shaped' pendants were representations of composite recurve bows, citing the depictions at Göhlitsch in Germany and those at Sion in Switzerland as supportive evidence. However, as outlined by Fitzpatrick and Barclay (2011: 161-163) the complete and fragmentary Neolithic-Bronze Age bows found to date in the British Isles (Figure 8.19) and western areas of the Continent are all of the 'self-bow' (i.e. made from a single piece of wood) form, although inconclusive evidence for recursive bows has been recorded from a Globular Amphora Culture burial (c. 3030-2340 cal. BC) at Bożejewice

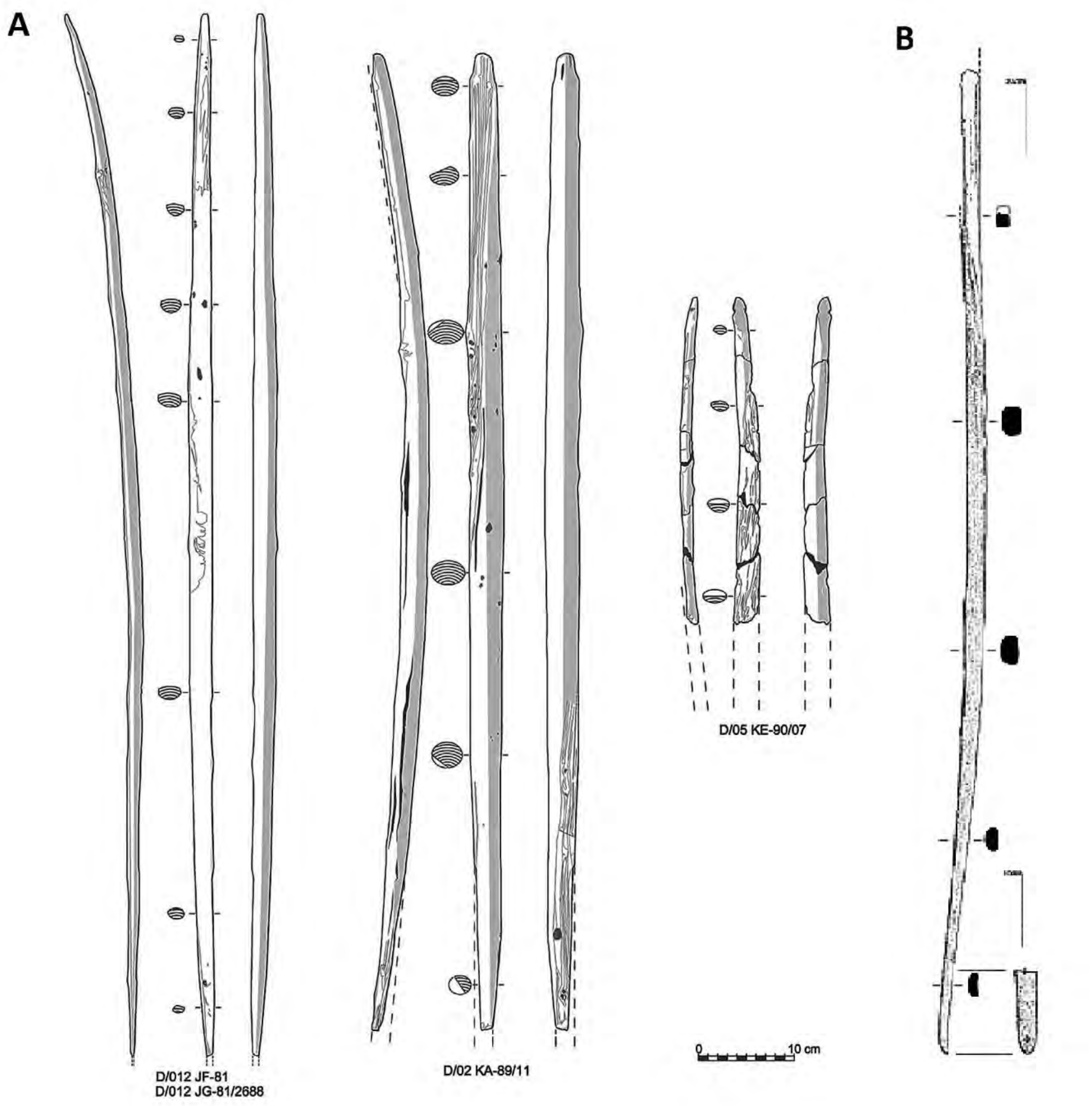


Figure 8.19: Evidence for hunting. (A) The bows from La Draga (Spain) (Piqué, et al., 2015: Fig. 4.); (B) Bowstave (c. 2399-2042 cal. BC) found in Ballybeg Bog, Co. Offaly (Ireland) (Murray, 2004: no figure number)

(Kujawy-Pomerania) in northern Poland and the primary burial in Raunds barrow 1 (Northamtonshire) in the English East Midlands. In addition, the current absence of definitive evidence for composite bows usable by mounted archers and the overwhelming absence of horses from Beaker contexts (Shepherd, 2012: 278; Sheridan, 2012: 51), an exception being the specialized horse herders/breeders of the Hungarian Csepel-Group (Heyd, 2007a: 339), suggests that horsed archery was not typical of Beaker-using communities.

Nevertheless, there is certainly evidence to indicate that archery-based hunting took place, but its visibility in the archaeological record, and perhaps engagement in such practices varied greatly regionally and it does not appear to have played more than a minor role in Beaker using subsistence economies. Occasional unequivocal physical evidence for archery-based hunting activity has been documented, for example, two Beaker period finds from a former lake at Langeland in Denmark (Skaarup, 1985: 392; Sarauw, 2007: 75). One of these was a pike with an arrowhead shot into the skull, the other the remains of a red deer closely associated with an arrowhead.

Regional variation in the frequency of engagement in hunting can also be proposed. For instance, analysis of faunal assemblages on Late Neolithic-Chalcolithic sites in southern France suggests that hunting may have increased and been at a height during the early Beaker period. It also appears that a slightly more diverse range of wild species were exploited during this period than both the local Late Neolithic and the later phases of the Beaker period itself (Blaise, 2009). Analysis of faunal assemblages from southern Britain (Serjeantson, 2011: 38-45) indicates that levels of hunting varied between the Neolithic and EBA. The percentage of wild animals in faunal assemblages on Late Neolithic sites is lower than the earlier Neolithic. However, wild animal remains have been found within a higher percentage of Late Neolithic assemblages (c. 80%) and they consistently include a wider range of species, suggesting that low levels of hunting may have been undertaken relatively regularly during the Late Neolithic in southern Britain. There appears to have been a subsequent decline in hunting and the overall presence of wild mammals is at its lowest on sites dating to Beaker period (<3%), a severe drop in the presence of red deer being particularly notable. Nevertheless low numbers of wild animals have been recorded in many assemblages (c. 70%), suggesting that low levels of hunting were a minor component of Beaker economies, but its importance appears to have been comparatively lower than in the Neolithic.

Engagement in ceremonial hunting-style activities is also a possibility as suggested by evidence from Durrington Walls (Wilshire) in southern England. In this instance it is unclear as yet whether this relates to Late Neolithic or Chalolithic Beaker associated activity on the site, but embedded projectile points have been identified in a cattle femur and three pig bones (Albarella and Serjeantson, 2002: 43-44; Chan 2009: 4; Parker Pearson, et al., 2011: 86). The injuries resemble hunting damage and were identified on the wide variety of bones suggesting that at least some of the animals were shot from a distance, which could indicate that these animals were dispatched during ceremonial slaughter or engagement in some form of 'mock hunting' or 'coursing'.

8.9 Evidence for Violence and Conflict

8.9.1 Violence before and after the Beaker Chalcolithic

In Britain there is scattered evidence of interpersonal violence during the earlier Neolithic (c. 4000-3200 BC) including numerous cases of fatal projectile injuries (Mercer, 1999; Thorpe, 2006: 144-145; Schulting, 2013: 23). Instances of blunt force trauma to the head have also been documented (Schulting and Wysocki, 2005; Thorpe, 2006: 145-146; Schulting, 2012), but the overall prevalence of such injuries appears to be relatively low and frequently non-lethal. Evidence for earlier Neolithic violence in Ireland includes healed fractures on a skull and rib and a chert projectile point embedded in an adult male's right hip from Poulnabrone portal tomb (Clare) (Lynch and Ó Donnabháin, 1994; Lynch, 2014). In addition, an adult male buried at Linkardstown (Carlow) had several healed skull fractures (Raftery, 1944) and healed blunt force trauma has recently been identified on one of the skulls from the Parknabinnia court tomb (Clare) (Jones pers. comm.).

On the Continent, evidence for head trauma, and other signs of interpersonal violence, appear to be relatively low among Portuguese earlier Neolithic (c. 5000-3200/3000 BC) collective burials (Silva, et al., 2012; Oosterbeek and Tomé, 2012), but such injuries, probably inflicted during face-to-face altercations, appear to have occurred at higher frequencies in southern Spain (Jiménez-Brobeil, et al., 2009). In the LBK Early Neolithic of Central Europe (c. 5000 BC) at least two mass graves containing the victims of massacres have been documented. These have been recorded at Talheim (Figure 8.20; Baden-Württemberg), south-west Germany (Guilaine and Zammit 2005: 86-91; Bentley, 2007; Bentley, et al. 2008; Bickle and Hofmann, 2007: 1035; Wahl and Trautmann, 2012; Duering and Wahl, 2014) and Asparn-Schletz in Lower Austria (Teschler-Nicola et al., 1996, 1999; Guilaine and Zammit 2005: 91-92; Teschler-Nicola, 2012).

Heightened levels of violence has been documented around the western Mediterranean during the later 4th and early 3rd Millennia, in the Late Neolithic and pre-Beaker Chalcolithic. In both Iberia (Beguiristain and Etxeberria, 1994; Guilaine and Zammit, 2005: 152-156; Etxeberria, et al., 2006: 348; Begiristain, 2007; Vegas, 2007; Marquez, et al., 2008; Beguiristain, et al., 2010; Vegas, et al., 2012; Fernández-Crespo, 2015) and southern France (Guilaine and Zammit, 2005: 124-157; Vander Linden, 2006b; Beyneix, 2007, 2012) this evidence consists primarily of fatal projectile injuries, but depressed cranial fractures and occasional injuries from bladed objects also occur Figure 8.20. There are however, as noted by Schulting (2013: 29) and Thorpe (2013: 594), questions over the contemporaneity of the deposits at such sites as Roaix (Vausluse), Las Yurdinas

II and San Juan ante Portam Latinam (Álava) (Figure 8.20), the Longar Hypogeum (Navarre) (Figure 8.20) and Costa de can Martorell (Barcelona), and thus how they should be interpreted.

Evidence for violence during the pre-Beaker Chalcolithic is also present in neighbouring regions. For instance, flint arrowheads were intermingled with the remains of a possible family group buried at Camino de las Yeseras (Madrid), and it appears that they were all killed within a short space of time (Liesau von Lettow-Vorbeck, et al., 2014), and a prominent example was discovered in the Alpine region. The mummified remains of Ötzi 'the Iceman' (c. 3366-3118 cal. BC), who died following a violent altercation, were recovered from the Ötztal Alps, near Hauslabjoch on the border between Austria and Italy. Physical evidence has indicated that the 40-50 year old man been travelling on foot for a number of hours before he died (Gostner, et al., 2011), and that he received a fatal arrow injury which lacerated his left subclavian artery (Pernter, et al., 2007). It had been reported (Nerlich, et al., 2009) that he may have also suffered a fracture to his right humerus, but it was subsequently determined to be post-discovery damage (Gostner, et al., 2011).

Within the Late Neolithic TRB Culture (c. 3200-2800 BC) violence appears to have been endemic (at least among the Wartburg group located around Hesse), and carried out at different scales, ranging from altercations between individuals, to raiding activities and potentially more organized battles. Victims were frequently women and children and the distribution of cranial injuries indicates they were never among the aggressors (Fibiger, 2012). In contrast, (predominantly non-lethal) cranial injuries are largely limited to adult males within the Corded Ware Culture (c. 2800/2700-2000 BC) of Central Germany, and these are mostly those buried with battle-axes (Wicke, et al., 2012). However, evidence for lethal group conflict, possibly a raid in this instance, has been recorded in a Corded Ware context (c. 2600-2570 cal. BC) at Eulau (Saxony-Anhalt). Evidence for ante- and peri-mortem trauma has been identified on the male, female, and sub-adult skeletons, including cranial trauma, arrow wounds, and fractures of the forearm and hands confirm the violent deaths of all the individuals (Haak, et al. 2008; Meyer, et al., 2009).

As summarized by Thorpe (2006: 153-154; see also Osgood, 1998; Mercer 2007) there are few examples of individuals involved in violent events during the British EBA. Those that have been recorded include individuals displaying injuries to their arms or blows to the head, the most dramatic example being a decapitated adult male (c. 2205-1895 cal. BC) discovered within a pit at the foot of the Gog Magog Hills (Cambridgeshire). There are examples of both healed and unhealed injuries in the Irish EBA burial record, but a comprehensive review of the material has not been undertaken and is outside the scope of the current study. It is possible that some of the

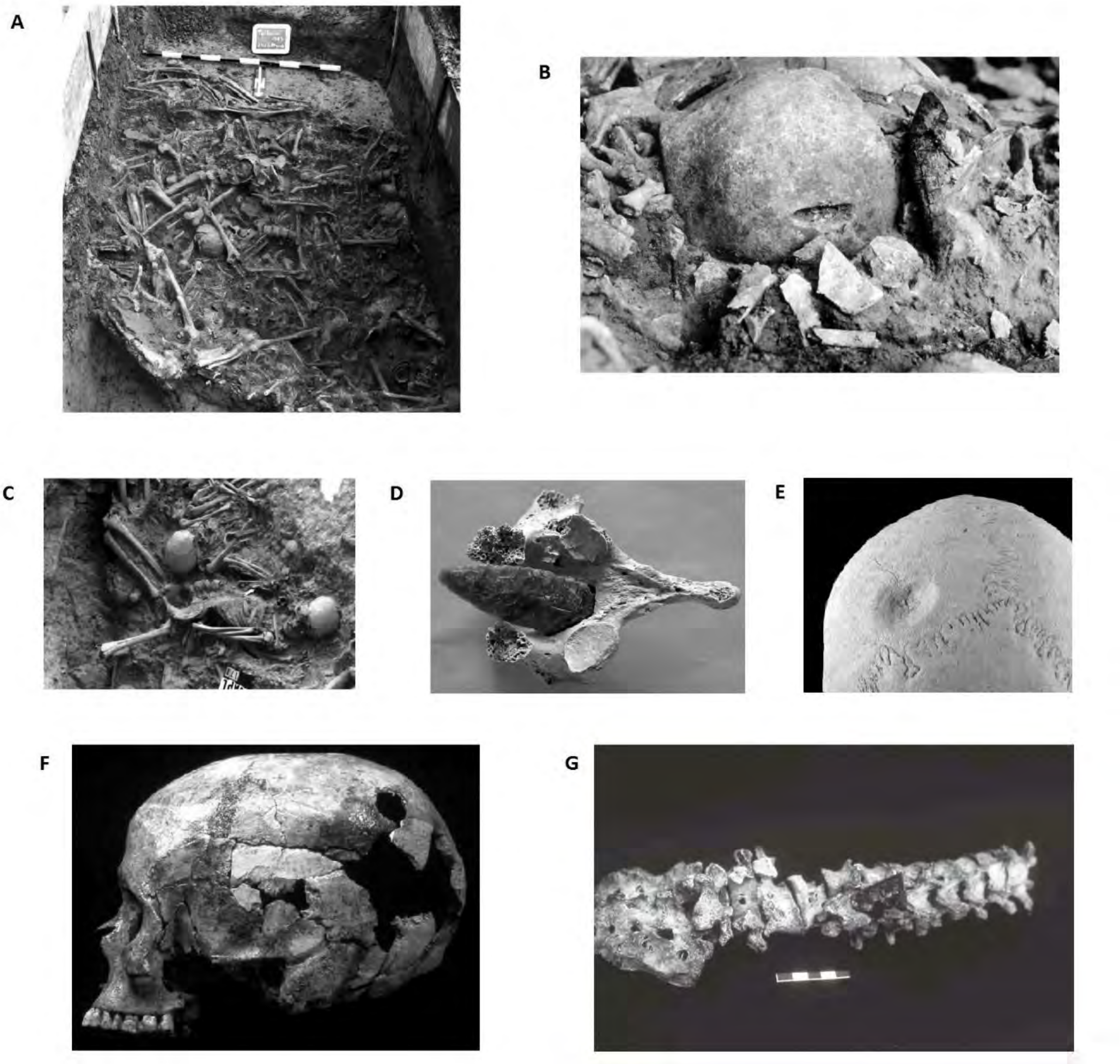


Figure 8.20: Physical evidence for violence. (A) Mass grave at Talheim (Germany) in the course of excavation. (Price, et al., 2006: Fig. 3.); (B) Detail of the deposit of San Juan Ante Portam Latinam (Iberia) (Marquez, et al., 2008: Fig. 4.); (C) Vertebra from Longar Hypogeum (Iberia) with flint arrow-point attached (Marquez, et al., 2008: Fig. 3.); (D) Blunt force trauma (depressed fracture) on outer surface of left parietal bone from Dólmenes de Los Vínculos (Jiménez-Brobeil, et al., 2009: Fig. 2.); (E) Violent impact on the left parietal bone of individual no. 4 (grave 2) of Les Châtelliers du Vieil-Auzay (France) (Beyneix, 2012: Fig. 12.2.); (F) Copper dagger blade set in a vertebra from Pas-de-Joulié at Trèves (France) (Beyneix, 2012: Fig. 12.7.); (G) Wound in the frontal bone caused by a small stone axe, Les Boileau, Sarrians (France). Photo E. Mahieu. (Beyneix, 2012: Fig. 12.8.)

injuries were the result of inter-personal conflict, but none involved projectiles or bladed objects. These include an young adult female buried at Carmanhall (Dublin), who may have suffered a violent death (Reilly, 2005), adult males buried at Ballybrew (Wicklow) (Waddell, 1990: 19) and Graney West (Kildare) (Mount, 1997a), who suffered leg injuries, and a young adult male buried at Grange (Roscommon) who suffered a hand fracture, probably caused by full blow to knuckles (Ó Ríordáin, 1997).

In Central Spain evidence from the fortified hilltop site of La Motilla del Azuer (Ciudad Real) indicates that the frequency of skeletal trauma (e.g. cranial trauma and possible parry fractures) was more frequent among men and occurred at much higher levels during the earlier phases of the site c. 2200/2150-2000/1800 BC (Jiménez-Brobeil, et al., 2014). The remains of a 19-20 year old male (c. 2040-1870 cal. BC) found within the site show signs that he suffered a particularly violent death (*ibid*. 652-658). In south-eastern Iberia the number and distribution of cranial injuries in Western Granada (c. 2000-1500 BC) are also consistent with increased levels of violence, with a predominance of frontal cranial injuries being inflicted upon males (Jiménez-Brobeil, et al., 2009). Evidence for cranial trauma in the Argar Culture (beginning c. 1700 BC) in eastern Spain follows this general pattern and is also overwhelmingly among males. The frequency of these cranial injuries is marginally lower than in West Granada, but considerably higher than the Copper Age (Aranda-Jiménez, et al., 2009; Jiménez-Brobeil, et al., 2009).

In Slovakia and Moravia evidence for trauma, particularly blows to the head, is comparatively frequent among the (normal) graves of the Nitra culture (c. 2200/2150 BC-1930/1870 cal. BC), predominantly on male skeletons, followed by females and children. These occur throughout the Nitra period, but are more common during the later phases, suggesting that violent clashes became more common over time (Hårde, 2006: 364-370). During the subsequent Úětice period (c. 1870-1730 cal. BC) there is increased evidence for both fortified sites and mass graves, at such settlements sites as Kelllasbrunn in the north-east of Lower Austria and Nižna Myšľa (Kosice) in eastern Slovakia, where storage pits contained individuals of different ages and sexes, whose skeletons displayed varying degrees of trauma and mutilation (*ibid*.: 372-381). In north-west Europe an isolated mass grave (c. 1700 BC) has been recorded at Wassenaar (South Holland) in the Netherlands. Here the remains of 12 individuals, including women and children, included a possible decapitation, three instances of unhealed cranial trauma, and a fatal projectile injury (Louwe Kooijmans, 1993).

8.9.2 Violence during the Beaker Chalcolithic

In Britain a number of individuals display arm injuries, the majority of which have been interpreted as parry fractures (Thorpe, 2006: 151-153; see also Mercer 2007). These include a young adult male (c. 2200 BC) buried with a Beaker at Chillbolton (Hampshire) who had a healed forearm fracture and a young adult male (apparently) buried with a Beaker in a cairn at Liffs Low (Derbyshire) who had a healed upper arm fracture. A mature adult male buried in the primary grave of a barrow at Pyecombe (Sussex) with a Beaker, bronze dagger and stone wristguard had healed collarbone and forearm fractures and one of the older adult males buried in a barrow at Barnack (Cambridgeshire) had a healed forearm fracture. In addition an adult male buried with a

Beaker (Grave 11) in a flat cemetery at Staxton (Yorkshire) with a healed fracture to the left hand, had probably died as a result of an injury to the left shoulder, a blade having fractured the clavicle and lodged into the scapula. Occasional injuries to the torso and head have also been reported (Thorpe, 2006: 151-152, 2013: 596). For instance, an adolescent buried in a barrow at Smeeton Westerby (Leicestershire) had suffered a possible injury to a chest vertebra and two of the adult males in the barrow at Barnack (Cambridgeshire) had healed head wounds. A probable older male had two skull depressions and a second adult male had a linear wound on his cranium. A fatal head wound was sustained by a female aged 50+ years (c. 2200 BC) who was buried within the primary grave of a barrow in the Parks Science Area in the Thames Valley (Berkshire). She had suffered an axe-blow to the back of the head and although the injury had begun to heal it appears this blow was the cause of death. Definitive evidence for projectile injuries are few (see Thorpe, 2006: 152 for other possible examples). A male aged 25-30 years (2340-2195 cal. BC) buried in the ditch at Stonehenge with a stone wristguard and three barbed and tanged arrowheads had suffered a number arrow shots from close range. The tip of one of which embedded in his ribs, a groove cut on a second rib has been interpreted as another arrow injury and the tip of a forth arrow was lodged in his sternum, probably having passed through the heart (Thorpe, 2006: 151, 2013: 596; Parker Pearson, et al., 2009: 24). Another example is a 20-30 year old male buried at Barrow Hills (Oxfordshire) with a Beaker, bronze awl and five barbed and tanged arrowheads was probably killed by an arrow shot to the spine as an arrowhead with broken barbs and an impact fracture was discovered against his spine (Thorpe, 2006: 151, 2013: 596). A third example is a female (2210-2030 cal. BC) buried in Feizor Nick Cave (Yorkshire) who had a penetrative injury to one of thoracic vertebrae indicating that she had been shot in the back with a projectile (Smith, et al., 2007; Thorpe, 2013: 596).

In Central Spain (Madrid) evidence for inter-personal violence has been identified on the fragmentary remains of a 55-65 male discovered in a disturbed hypogeum at Camino de las Yeseras, along with sherds of Beaker and a small decorated gold plaque. This individual had at some point in his life suffered a nasal fracture caused by a sharp blow to the nose (Liesau von Lettow-Vorbeck, et al., 2014). A similar facial injury was sustained by a male (c. 2696-2487 cal. BC) buried at El Soto de Tovilla (Valladolid) in north-west Spain who received a blow to the left side of his face with a blunt instrument (Esparza, et al., 2008: 21, 26). At Cerro de la Cabeza (Ávila) to the north-west of Madrid six individuals (c. 2620-2460 cal. BC) with fatal arrow injuries (including barbed-and-tanged projectiles) were interred within a pit along with a number of sherds of atypical bowl sherds (Fabián García and Blanco González, 2012: 101-106). A c. 30 year-old male (2340-2120 cal. BC) discovered in a small collective tomb, along with four other individuals, at

Humanejos (Madrid), was the victim of a major traumatic injury to the forehead, possibly caused by a copper adze or small axe (Liesau von Lettow-Vorbeck, et al., 2014). It has been argued (Marquez, et al., 2008; Soriano, et al., 2015) that the presence of barbed and tanged arrowheads with impact fractures in collective burials in north-east Iberia could indicate Beaker period violence, but this suggestion remains to be confirmed. However, the overall picture appears to be that there were only low levels of violence in the region during the Beaker associated Chalcolithic (Soriano, et al., 2015: 157-158) and the evidence for violence at Costa de Can Martorell (Marquez, et al., 2008) has since been assigned to the pre-Beaker Chalcolithic (Vegas, et al., 2012). In south-eastern Iberia Copper Age cranial injuries are most common among adult males, but at significantly lower levels than that has been recorded in the region during Neolithic and subsequent Bronze Age (Jiménez-Brobeil, et al., 2009) and there does appear to have been lower levels of violence across Iberia during the Beaker-associated Copper Age (see also Oosterbeek, 1997). The unique 'fortified' enclosures of Iberia, although undoubtedly defensive in nature, cannot be cited definitive evidence for endemic conflict during the Beaker-associated Chalcolithic. These enclosures first emerged c. 2800 BC and the majority were constructed during the pre-Beaker Chalcolithic. Although some examples were constructed during the Beaker period and there are instances where re-modelling occurred, some sites had gone out of use and many fell into disrepair during this period. Furthermore, both the re-modelling of pre-existing sites and the establishment of new enclosures occurred more frequently during the subsequent EBA (beginning c. 2200-2000 BC) (Kunst, 2001, 2005: 221-222, 2006; Guilaine and Zammit, 2005: 188-191; Thorpe, 2013: 594-596; Garrido Pena, 2014: 18). It appears that they served a variety of purposes (including centres of manufacture, redistribution and congregation) and considering the environmental constraints present in Iberia it may be advanced that during the Beaker period these functions included protection of resources, as they may have served to figuratively and symbolically deter the potential for violence.

Arguments for a reduction in levels of Beaker period violence compared to the Neolithic (and pre-Beaker Chalcolithic) have also been made for southern France and Italy (Robb, 1997; Guilaine and Zammit, 2005: 124-157; Vander Linden, 2006b; Thorpe, 2013: 594), and in the Czech Republic a combination of data-sets appear to point towards a similar conclusion. For instance, the proportion of analysed arrowheads displaying unequivocal evidence of impact fractures among those discovered in graves has to date been consistently low (Sosna, 2011, 2012), as is evidence for trauma produced by violence on Beaker-period skeletons in the region (Farkašová, 2011) and analysis of humeri has not identified any indications that suggest that archery was practiced to any great extent (Sládek, et al., 2007).

8.10 Romanticised Warrior Persona or something else?

As discussed above, it has been argued that the Beaker phenomenon and its associated "package" of artefacts was associated with a particular "ethos", and that connected with the core of this ideology was a figurative warrior/archer "persona" (e.g. Case 1995: 55, 60, 2004a: 29, 2004b: 200; Brodie, 1997, 298-311). It may be argued, however, that this interpretation does not in fact reflect the evidence entirely, considering indications that ceramic vessels could have carried a number of symbolic connotations, daggers are unlikely to have been utilized primarily as weapons, the bracers appear to have been largely symbolic, hunting significance appears to vary regionally and violence levels appear to have been comparatively moderate during the period. In the current author's opinion reference to a romanticised, mythical warrior persona does not explain the Beaker "ethos" or significance of the "archery package" sufficiently. However, a more nuanced interpretation may be advanced if these phenomena were connected to the widespread emergence of devotion, or even 'conversion', to a new and perhaps more complex version of pre-existing belief systems, perhaps involving the elevation of one or more deities to a more prominent position. This alternative explanation is explored below.

8.10.1 Pantheons and the alteration of Relative Deity Statuses

The existence of an underlying Eurasian pantheon of deities, associated with a degree of regional variation has been discussed previously (see Chapters 5 and 6). For instance, it has been argued that the pantheons of the Celtic, Roman, Greek, Indian and Egyptian regions had their roots in a suite of comparable deities. Belief systems, their associated narratives, representations and practices appear to become more complex over time and in historical contexts it is apparent that chronological variation in the importance and roles of various deities also occurs across time and space. In various periods there is complementary historical, artistic and archaeological evidence that demonstrates that certain deities were more significant in some regions than others and these variations are most frequently connected with groups giving their allegiance to particular gods or sub-sets of deities based upon their particular realms of 'responsibility'. Yet despite the varying importance of individual deities in polytheistic belief systems, the deities are frequently conceived as living and working together, interdependently just like a nuclear family, lineage, clan or tribe and in combination their roles complement each other and seek to protect their devotees. At this overarching scale, as a group the deities also serve to watch over the orderly working of the universe as a whole, a feat that the deities cannot achieve individually (Witzel, 2012: 426). In addition, as stated by Hassan (1998: 101) although we can regard individual goddesses or gods as separate individual entities, or as beings that may merge one into the other, it may also be useful to perceive deities as embodiments of a set of ideas and metaphors that coalesce in certain instances as iconic tokens for discourse or ceremonial purposes. Their distinctions may be at times linked to changing social or political conditions. If this is this case, and if belief systems were structured around various pantheons of similar and essentially correlative deities in earlier eras across Europe from the Neolithic through to the Iron Age, then surely the patterns of continuity and change witnessed in the Beaker period indicate the emergence of a new belief system that both differentiates itself from what existed before yet is extremely compatible with pre-existing beliefs. It may be the case that the appearance of the Beaker complex was connected with the development of a new version of a pre-existing pantheon and the elevation of a particular deity (or sub-group of deities) to new positions of significance.

There are numerous examples of deities whose roles and importance changed over time. There are instances where it can be demonstrated that one deity's role was altered and status reduced while another's was elevated. One such example from the Mediterranean is Poseidōn. In Greek literature of the Olympian tradition his authority was slight and his powers virtually confined to the control of earthquakes and storms at sea. However, Poseidōn features prominently within the ealier (pre-Olympian) traditions across historical Greece and his original role appears to have been that of Skyfather (Burkert, 1985: 44; Olmsted, 1994: 73-75; Voyatzis, 1998; see also 6.3.1). In fact, the Mycenaean Bronze Age Linear B tablets from Pylos (c. 1300-1200 BC) record Poseidōn as the chief deity. In addition, ancient cults of Poseidōn (c. 800-700 BC) have been recorded across Arcadia (Voyatzis, 1998: 141-143), and in both Boeotia and Thessaly Poseidōn was also recorded as preeminent in mythical genealogy (Robertson, 1984: 1).

In the Scandinavian context, Óðinn appears to have had his status elevated to that of Skyfather and provides an illustrative example of how a deity's role may be changed and in this instance increased status and a more prominent 'cultic' position bestowed. In recent years questions have been raised about the applicability of the overarching 'pantheon' model to the polytheistic Old Scandinavian religion, based in part upon the fact that evidence supports variation in the regional importance of deities (e.g. Andrén, 2005; Brink, 2007; Gunnell, 2012, and references). However, this does not entirely discredit the conclusion that an overarching 'pantheon' existed and its origins are prehistoric in date, as it is clear that both motifs and concepts evident in medieval Scandinavian religion can be traced back to the Bronze Age, if not earlier (Andrén, 2005: 124-126; see also Chapters 5 and 6). Another point that has been made about the medieval Scandinavian pantheon is that the divinities and their associated symbolism broadly correspond to those found elsewhere in the "Germanic world" and bear close similarities to those found in the Sami, Finnish, Baltic, and Slavic speaking regions (Andrén, 2005: 121). It may be argued that this indicates that a combination of factors, including the existence an overarching pantheon, specific regional trajectories, and ongoing or sporadic contacts and interaction with neighbouring (and distant) areas and cultures, shaped the symbolism, roles and traits of deities found in Scandinavia (and visa-versa) to varying degrees across time and this certainly does not represent an isolated or anomalous scenario. Analysis of place name evidence from across Scandinavia (Andrén, 2005: 121-123; Brink, 2007) has demonstrated that the importance of deities varied regionally, or to state it another way, particular deities had elevated cultic status in some regions, but not in others. This information has been utilized to argue that rather than being uniform and homogeneous, Old Scandinavian religion must be regarded as a series of partly overlapping traditions (Andrén, 2005: 123). While not disagreeing with this conclusion, it must also be noted that the same is true of the Greek, Roman and Celtic worlds where it is accepted that pantheons existed. In these regions the cultic importance of deities also varied regionally and across time and space and as will be argued below similar forms of variability are likely to have characterized prehistoric belief systems also.

It has already been noted (6.3.1) that Óðinn, although undoubtedly of pre-Roman Scandinavian/Germanic origin, had a highly composite character and that his original role is unlikely to have been that of chief god and alföðr (Andrén, 2005: 128; Gunnell, 2012: 136). In fact, it has been argued (e.g. Gunnell 2012: 136) that Þórr was the chief god and father figure (or in the case of some regions, such as Uppsala, had a 'central position'), in Iceland and parts of Norway and Sweden, during the Scandinavian Late Iron Age. It has been advanced (see Kaliff and Sundqvist, 2004) that Óðinn's initial rise in stature was due to contacts with Rome and that the Roman imperial cult could have been the source of the idea of Óðinn as ruler of the deities, and there are suggestions that ideas from the cult of Mithras may have been incorporated into Óðinn's post-Roman-contact character. At a later stage, according to Gunnell (2012: 136-137) there is clear evidence that many of the Viking-Age Danes, and the new class of rulers intent on national and international dominance (and those living around them) allied themselves with the cult of Óðinn (while at the same time other rulers and chieftains gave their allegiance to other gods). He argues that in Viking-Age Scandinavia specific religious or 'cultic' allegiances were intimately connected to both their regional importance and with clan or tribal affiliations. In this context it may be particularly notable that Brink (2007: 111-113) has demonstrated that there is a uniformity to Óðinn-bearing place-names across Denmark and that in general they are relatively evenly distributed throughout Scandinavia, with the exception of Norway.

8.10.2 Beaker Archery Symbolism and the example of Mithras – an informative comparison

The adoption of the cult of Óðinn by prominent clans in Viking-Age Denmark during a specific historical period may be a particularly informative example when trying to understand the dynamics of what led to the spread of the Beaker culture. In both cases it appears that commercial intensification played a role and in both there were neighbouring groups that adhered to differing ideologies. Further engagement with this idea of the cultic devotion of groups to particular deities may also prove informative in attempting to engage with the Beaker Culture warrior/archer "persona" associated most prominently with a drinking vessel, a dagger, archery equipment and the display of at least some symbolism suggestive of solar connotations, most commonly in the form of v-perforated buttons. In particular the Bronze Age Iranian Mitra or Roman (Iron Age) Mithras, another deity associated with solar symbolism, provides an informative comparison. It is also interesting to note that both of these versions of the Mithra deity are clear correlatives of the Irish Maccan Óc, a relationship that adds a further layer of interest to the comparison.

There are few details that survive surrounding the Iranian pre-Zoroastrian religion, the existence of which can be traced back to at least to the 2nd millennium BC, but the cult was dominated by sacrifices of bulls and drinking of the holy haoma, a drink of health and power that was specially connected with the sun-god Mitra (son of Ahura who ruled the cosmos against the evil Angra Mainyu, also known as Ahriman in the Pahlavi sources). The sacrifice and drink represented aspects of the three forms of life on earth, primeval man, primeval bull or cow and the herb of life (Prendergast, 1999: 178; Näsström, 2004: 109). The Iranian religious reformer and prophet Zoroaster (Zarathustra) outlawed all deities except the sun-god Mithra and his father the supreme deity (and God of Light) Ahura Mazdā in Zoroastrianism (c. 1000 BC). In this version of the cult, as in its earlier manifestation, Mithra was sent to Earth to slay a great bull whose blood was the source of all fertility, mirroring an act once performed by Ahura Mazdā, the renewal of the world (or new creation) following Ahriman´s destruction of the three forms of life on earth. The central event of the cult myth, the slaying of the cosmic bull, was seen to represent the act of creation at the beginning of time (Heinberg, 1993: 92; Näsström, 2004: 109; Clauss, 2014: 251-253). Zoroaster disagreed with animal sacrifice and forbid the practice (a trend which continued in Iranian religion) and for this reason sacrifice was considered to be an invention of the evil Ahriman in the Pahlavi tradition. However, the bull-sacrifice myth of the earlier Mitra was retained, but the idea that Mithras turned his eyes away while the stabbing the bull in the cave was introduced (Näsström, 2004: 109).

Archaeological evidence (over four hundred sites and find-spots) connected to the Roman Mithraic cult, dating to between the 1st and 3rd centuries AD, has been documented from across the entire Empire, with notable concentrations around Rome, the port of Ostia, and along European frontier zones (Prendergast, 1999: 178; Clauss, 2014: 244-247). The route and timing by which the Mithras cult arrived in the Roman Empire has been much debated (see Swerdlow, 1991; Beck, 1998; Nässtrmöm, 2004: 108; Clauss, 2014: 244-247). Beck (1998: 121-124) has advanced what appears to be a particularly convincing argument. He argues that Roman Mithraism's founding group came from the dependants (military and civilian) of the dynasty of Commagene originating in the eastern part of the Empire, as it made the transition from client rulers to Roman aristocrats around 72 AD. He proposed that the Roman Mysteries of Mithras were developed within a subset of Commagenian soldiers and family retainers who transmitted their cultic beliefs at various points of contact to their counterparts in the Roman world. He argues that the “essentials” of the Mysteries (i.e. the identification of Mithras as a sun-god and the utilization of astronomical/calendrical symbolism) were present prior to their transmission to the Roman Empire. As Beck notes, Mithras held a prominent position in the pantheon of the Commagenian Greco-Iranian royal cult (first established in the mid-1st century BC), as attested both archaeologically and historically (*ibid*.). He suggests that the concept of bull slaying being regarded as an act of 'salvation' or 'redemption at the end of time' was a new innovation (Heinberg, 1993: 92; Beck, 1998: 123-124). Essentially, ceremonial bull-sacrifice returned to Mithraic cultic practice under its Roman guise, with slightly redefined or more complex connotations, as animal sacrifice was a common component in the Roman religion and sacrifice of a bull represented the most precious gift to the deities. The innovative creations or additions of the Romanized Mysteries were: (a) the redefinition of celestial dimensions of the bull-killing ceremony which were expressed in the patterns of a narrative allegory (a more complex version of its antecedents); (b) the symbolically defined cosmological structure of the Mithraeum; and (c) the organizational structure of the seven-fold cultic grade hierarchy, whose principle of arrangement is a sequence of the planets (Beck, 1998: 124-125, 2000: 160-163; Prendergast, 1999: 178-179; Clauss, 2014: 247-253, 256). The Roman version of Mithras was the son of Helios/Chronos/Saturn who requested that he sacrifice the Bull and spread the blessings of its body to mankind, an act he unwillingly performs with a dagger (or alternatively a sickle) after dragging the animal into a cave (Prendergast, 1999: 179; Näsström, 2004: 109).

The practices and symbolism of the secretive Roman cult have been reconstructed primarily from archaeological evidence, the material remains of Roman Mithraea, and their associated sculpture, frescos, inscriptions and depictive pottery (Prendergast, 1999: 178; see also Beck, 2000). The three central motifs depict Mithras’ life cycle: his birth from the cosmic egg or rock; the slaying of the bull; and the subsequent celebratory feast enjoyed by Mithras and his father. Mithras’ life cycle and these events were cyclical, with Mithras’ birth being commemorated at the winter solstice and the bull-sacrifice and feasting at the spring equinox. This emphasizes connections with the winter/spring sun and associations with life, death and re-birth (Prendergast, 1999: 179). Furthermore, it appears that seasonal change, the turning points of the yearly solar cycle (solstices and equinoxes) and the directionality of celestial motion were also represented symbolically within the architecture of the Mithraea and referenced within the cultic processional acts, and feasting activities performed during the seasonal and initiative ceremonies (Beck, 2000: 148, 154-165; Clauss, 2014: 253-256).

The replication of mythological bull-slaying and feasting appear to have played an important role in both Mithraic seasonal ceremony and cultic initiation (Beck, 2000: 145-146, 150). In addition to these aspects, of particular interest in the current context is the association between Mithras and archery. As summarized by Beck (2000: 149-152; see also Horn, 1994; Merkelbach, 1995; Clauss, 2014: 251) in an episode of the cult myth, the so-called 'water miracle', Mithras shoots an arrow at a rock to draw water from it. The archery is interpreted as a victory over drought, an action once performed by the deity in mythic-time to relieve world-wide aridity and thus performable again in ‘actual time’ at the behest of his devotees. Water both gives and sustains life, so the 'water miracle' is seen as an achievement of Mithras as the creator and/or enabler of physical life and growth. It appears that the mythic event was replicated as a rite of initiation, by the feigned archery of the Pater/Father. During this ceremony the initiator (the Pater/Father), in the guise of Mithras takes on the role of archer, and imitated the deed of Mithras during the process of initiation. Thus, the initiation procedure derived its ‘authority’ from what was done (or is done timelessly) by Mithras, as acceptance into the cult represented admission into a ‘more abundant life’ symbolized by the waters released by Mithras.

8.11 Conclusion

It may be advanced that the Beaker complex represented a mythologically and ‘theologically’ invigorated supordinate identity which was incorporated and reconciled with preceding traditions across Europe, suggesting that pre-existing (sub-group) identities continued to exist following its ascension. Characterizing the Beaker phenomenon in this way, and approaching other ‘cultures’ in a similar fashion, could also help to explain: (a) why some groups made a conscious decision not to adopt Beaker Culture despite living in close proximity to contemporary Beaker groups; and (b) why Beaker groups deemed it necessary to symbolically and/or ideologically segregate themselves from contemporary ‘cultures’, most notably in the funerary sphere.

Taking ethno-historical information into account, in addition to associations with potential changes to social structure, economic intensification and the emergence of new social statuses, it may be proposed that the emergence and spread of the ‘culture’ may also have involved the re-modelling of deity pantheons and devotion, or even 'conversion', to a new and perhaps more complex version of pre-existing belief systems. Mithra(s) provides an informative example of how the elements of the Beaker-associated "archery package" could have been coherently integrated into a 'cultic' belief system. Mithra(s), a correlate of such sun-associated deities as the Irish Maccan Óc and Egyptian Horus-Ra, was connected with solar symbolism, archery, hunting, the use of a dagger in cattle sacrifice, the drinking of an alcoholic beverage from a ceramic vessel, and feasting. As such, it may be advanced that Beaker "ideology" may have been connected with the elevation of one or more deities to a more prominent positions and the emphasis on "archery symbolism" in funerary contexts may have been related to symbolic expression of 'cultic devotion' to a particular member of this pantheon, perhaps a particular solar-related deity in the mould of Ra or Mithra(s).

The appearance of the Beaker complex in Ireland represents the arrival of a truly 'international' identity and its introduction must have impacted upon and transformed Boyne-associated group identities. The pre-existing importance of Brú na Bóinne suggests that acceptance of the Beaker complex within the region could have been beneficial to incoming groups, as integration into, and acceptance within pre-existing contact networks would have been important. The allure of the Beaker complex to native groups may have involved access to the expanding trade and exchange networks facilitated by membership of the superordinate Beaker identity, but other factors may have contributed to the process. It has been advanced that the Boyne Valley was connected with calendrically associated gatherings, with a particular emphasis on 'solar journey' associated mythology during the Neolithic. Beaker material is conspicuous within and around the Boyne Valley, and at many of these sites, including both Newgrange and Knowth, the material appears to have been connected with feasting activity. If it is correct to conclude that Beaker 'ideology' was underpinned by cosmology, mythology and even a form of theology, then it may be advanced that the process of assimilation may have been facilitated by similarities, or relative compatibilities, between the incoming and pre-existing native beliefs. Although 'classic' archery burials appear to be absent, objects connected with the Beaker 'archery package' have been found within burial and ceremonial sites across eastern Ireland, and within the Boyne Valley. If the 'archery package' was symbolically connected to a solar-associated deity, then active 'cultic devotion' to this figure, perhaps identifiable with a pre-existing native deity associated with Newgrange and Brú na Bóinne, may have played a role in the success of the Beaker complex in Ireland.

Section III

ENDURING, BUT NOT STATIC, CONCEPTS AND FRAMES OF REFERENCE

9 DISCUSSION & CONCLUSIONS

9.1 INTRODUCTION

The following chapter aims to synthesise the themes raised by the the preceding chapters in an Irish context and highlight how these developments were manifest in the Boyne Valley. Taking the Irish passage tomb tradition as an example, a basis for acknowledging the presence of coherent beliefs systems reaching back to the Neolithic is outlined. This brings together the structuring principles of natural cycles, calendrical systems, landscape, and engagement with architectural and iconographic representations of cosmological and mythological concepts. The manifestation of these developments are then expanded upon and given further chronological resolution through the lens of the Boyne Valley.

9.2 CALENDAR SYSTEMS

Though investigation of historical calendar systems and consideration of the cyclicality of seasonal and lunisolar patterns which would have informed the ‘rhythms’ of prehistoric life a possible structure has been advanced for yearly Neolithic-Bronze Age calendars. Natural cycles would have provided the fundamental structuring principles informing the timing of agricultural and other economic activities and anchoring ceremonial or religious festivals. It is extremely unlikely that purely solar calendars were in use, their occurrence being historically atypical, and a lunisolar structure must be almost a certainty. Historically the first appearance of the crescent moon, or less frequently the new or waning moon have been used to mark the start of the lunar calendar months (the use of the rising of the full moon cannot be ruled out in prehistoric contexts), with seasonal changes and the beginning/end of calendrical segments being marked by its first appearance before or after a solstice/equinox and it is likely that such systems were in place during the European Neolithic and Bronze Age.

It has been advanced, that ethno-historical information suggests that it is probable that two calendars were used simultaneously, one being primarily focused on the ‘economic year’, the other having an overtly ceremonial or religious purpose. While natural seasonal changes will have been incorporated into the economic calendar their timing is variable, so the beginning of associated activities will have been similarly flexible and as such the economic calendar is likely to have had a degree of pliability. In addition, although seasonal changes broadly coincide with the astronomically defined cross-quarter days, their calendrical importance has unclear antiquity and natural seasonal change may have been more of a structuring force during the Neolithic-Bronze

Age. Notwithstanding, it has been argued that the economic calendar is likely to have been divided into two halves with the divisions being marked by either the natural beginning of spring or the vernal equinox and the natural beginning of autumn or the autumnal equinox. In terms of the ceremonial or religious calendar, there are strong indications that its 'focus' and the beginning of its yearly cycle would have been the astronomically predictable and observable winter solstice, this also being the locus of 'New Year' festivals in numerous historical calendars. Within this cycle, and in terms of the lunisolar calendar, important points of the economic calendar, most notably the periods connected with seasonal change and the solstices and equinoxes appear to represent the most plausible times of commemoration or ceremonial observance. It is also feasible that additional astronomically defined points of the year are likely to have been commemorated with cyclical ceremonial or religious festivals.

To date, the orientation patterns of the TRB passage tombs of central and northern Europe have been analysed in a much more nuanced manner than the megaliths of France, Iberia and the British Isles. With some regional, variation the overall pattern includes alignment peaks connected with: (a) the equinox sunrises and/or the rising full moon near the equinoxes; (b) the rising full moon one month before or after the equinoxes, close to the end of October or beginning of November and early February; (c) sunrise close to the end of October or early November and early February; (d) sunrise at summer solstice or winter solstice sunset; and (e) winter solstice sunrise. The current author has argued that these peaks clearly demonstrate calendrical concerns within a system integrating lunar months and solar years. Elsewhere in western Continental Europe the overwhelming majority of megalithic monuments have been described as being aligned between sun/moon-rise and sun/moon culmination above the horizon, and similar patterns are evident among many of the monuments in the British Isles, suggesting that similar orientation peaks may well be present, but this cannot be verified in the context of the current study based upon the available data. However, it can be noted that clustering of orientations around equinox and solstice directions do appear to be present. In addition, as noted the importance of the winter solstice is evident among British monuments where sunrise and sunset alignments have been documented at such sites as the Dorset Cursus, and the Stonehenge, Durrington Walls and Thornborough complexes in England and Maes Howe on Orkney. In the current study is has also been advanced that a more nuanced reading of 'imprecise' alignments from a perspective that incorporates an understanding of the "economic calendar" may further elucidate their significance and provide an 'explanation' for their 'alleged' inaccuracy. In this context it has been argued that the 'spread' of the alignments of such monuments as Cairn G at

Carrowkeel in Ireland and Maes Howe in Scotland were deliberate and intended to mark a series of "economic calendar" periods, in addition to having central orientations.

9.3 CHANGING REPRESENTATIONS OF IDEOLOGY

Taking the Irish passage tombs as an example, it may be advanced that in general terms (across the 'megalithic world' and Neolithic Europe) there may have been relative chronological, regional, local, and situational changes and adaptations to representing similar religious, cosmological and mythological ideas or ideology through varying combinations of monument siting and architectural preferences and innovations. It this context it has been argued that passage tombs should be viewed as elaborate doorways which facilitated 'travel' between different realms and tiers of the cosmos. It has been advanced that the simple passage tombs (Hensey Group A), which should perhaps be classified as "shrine alters", being sited in coastal and riverine locations may indicate a desire to engage in ceremonial activity in locations where the heavens, earth and "underworld" converged. These monuments were somewhat accessible as materials could be added/removed and interred individuals may have served an intermediary function, facilitating communication with the "otherworld". Their open morphology suggests ceremonial activities would have been visible and communally focused.

The majority of cairn-covered structures (Hensey Group B) were typically located in isolated landscape situations on elevated land, hilltops and/or near river boundaries, suggesting similar cosmological concerns to the simple monuments, but presenting a different solution to engaging with ideas connected with the three-tiered division of the cosmos. These include the earliest specimens to feature 'megalithic art' and 'imprecise' astronomical alignments which indicate further elaboration of this engagement as does the establishment and/or expansion of monument complexes. Hensey has argued that architectural elements such as recesses, shelves and door-stones could indicate that they were utilized for prolonged "rites of seclusion", which it could be argued indicates the supplementation of community based engagements with the addition of more individual or personal forms of ideological interaction. The most architecturally complex passage tombs (Hensey Group C) were sited referentially by the location of pre-existing complexes, with many being situated in visibly prominent locations. It has been suggested that constructing monuments in such locations could have further emphasized their pre-existing importance or significance of the locations, but it may also be advanced that it indicates a further development in communal understandings of what was appropriate or required to physically conceptualize or represent tri-partite cosmology. Further elaboration is seen in additional architectural embellishments, which suggest varying connections to more intricate individual and communal ideological representation and engagement, including stone basins, more abundant art, straightened façades, platforms, standing stones, multiple stone settings, the external deployment of quartz, and in some instances structures possibly related to procession.

As summarized, Robin has demonstrated a consistency in the symbolic architectural representation of a three-tier cosmology within the Irish passage tomb tradition with the monuments representing a system of concentric spaces and axial emphases, with the passage physically and symbolically connecting the outside world to the chamber and the centre of the mound. In architecturally sophisticated passages this concentricity was augmented with the addition of architectural thresholds which correspond spatially to successive layers inside the tumuli. The passage tomb axis and spatial concentricity was further enhanced iconographically through the deployment of art at thresholds and at specific external locations along kerb-lines. It has been advanced in the current study that in addition to three-tier cosmology, monument structure and layout may also have referenced 'symbolic' sun-wise directionality. The majority of European Neolithic megaliths are customarily aligned eastwards and generally towards the rising sun, but varying orientations are evident among the Irish passage tombs, although it is notable that they are customarily sited along the east-west axis of ridges. Despite this regional anomaly it has been advanced that the structure and layout of megaliths, irrespective of individual orientations, could have referenced a 'cosmological ideal', with the entrance symbolically located at 'sunrise' and the rear/backstone at 'sunset'. In this context it has been advanced that in the case of monuments that could be entered, movement towards the chamber could have symbolized sun-wise directionality from 'sunrise' to 'sunset'. In the case of passage tombs where a right-hand side preference (or differentiation between 'left' and 'right'), has been identified (in architecture, art and depositional practices) this pattern could also have made symbolic reference to sun-wise directionality if the backstone/rear of the chamber also symbolized 'south'. If this were the case, irrespective of monument orientation, right-hand emphasis would indicate a symbolic connection with 'sunset', with the left-hand side referencing 'sunrise'.

It has been argued that coherent cosmological and mythological belief systems reached back to the Neolithic and that these integrated 'journey of the sun' and Milky Way associated mythologies with a belief in a three-tier cosmos. Approaching the structural utilization of quartz from this perspective and in light of its ability to produce 'triboluminescence', 'rainbows' and 'glow', it can perhaps be interpreted as a way of representing aspects of these concepts with allusions to a combination of the solar journeys, the sun and sunlight, in addition to the Milky Way and rainbow symbolism, and perhaps related connections with water, renewal, re-birth or even the "soul". Other symbolic allusions to 'fertility' may have been connected with architectural elaborations including standing stones (some being markedly ‘phallic’) being situated outside entrances and some basin stones possibly representing ‘ceremonial querns’, in addition to some pendants, pins, cylindrical stones and balls potentially carrying related messages. It has also been argued that in addition to some ‘sun-dial’ motifs having calendrical and by extension journey of the sun connotations, that other ‘figurative’ solar journey and three-tier concepts are identifiably depicted in Irish megalithic art. It has been argued that possible representations of ‘solar symbols’, ‘boats’, ‘arboriforms’ and ‘serpentiforms’ and at least one whale are present. It has been argued that these motifs further demonstrate that ideological coherency was present and that these represent a regional variant of a consistent European-wide iconographic system (this including solar-related symbols, ship-symbolism, ‘bow’, lotus/lily, ‘arboriform’, horse, bovine, avian and ‘serpentiform’ motifs, and ‘weapons’) which grew progressively more complex during the course of the Neolithic-Bronze Age and was connected with illustrating the inter-related ‘journey of the sun’ and Milky Way associated mythologies, and three-tier cosmology. Furthermore, it has been advanced that Neolithic megalith-using communities in Western Europe shared an artistic grammar and underlying ideology, with certain geographical and chronological differentiations involving variances in the relative significance of certain symbols, motif styles and associations. It is clear that Irish, Breton/French and Iberian art share certain motifs and combinations, but regional preferences are apparent in each area, and each artistic tradition could be described as its own dialect. In this context it is perhaps particularly notable that similar representations alluding to representations of tri-partite division are present within the repertoires of both Brittany and Ireland.

As noted, Hensey (and others) have argued that individuals or small groups of people spent time within some passage tombs for the purpose of viewing astronomical events over extended periods and that “rites of seclusion” may have been a widespread and integral aspect of initiation processes. Robin’s pragmatic spatial analysis has demonstrated that motifs were not placed randomly, that symbolic ‘grammatical rules’ were observed, and that they dictated the repeated deployment of particular motifs in predetermined, recurring architectural locations within and around monuments, most notably at ‘threshold’ points. While acknowledging that it is probable that a deep knowledge of iconographic symbolism and associated beliefs would have been essential for magico-religious and ceremonial specialists who would have been in a position to read more into symbols than others, it has been argued that communities must have had an understanding of the belief systems to which they adhered and cannot have been ignorant of the significance or substance of symbolic representations. It has thus been argued that it is probable that megalithic art communicated (at least) aspects of ideology to the general population.

It has been outlined that apparent 'after death contacts' (ADCs) and 'sensing of presence' are cross-cultural and worldwide phenomena occurring across historical periods. Ethno-historical information indicates that specialist magico-religious practitioners engaged in elaborate and time consuming procedures to achieve altered states of consciousness (ASCs) and make 'after death contacts', but in fact within societies where contacting the dead is considered achievable, non-specialists may also engage in such communication. Experiencing ADCs would have allowed people to maintain or strengthen connections with deceased individuals, feeding the continued regeneration of communal bonds and group identities. If it was widely believed that the dead were contactable in Neolithic Ireland (and Europe) then individual expectations would have been that 'after death contacts' (ADCs) were achievable and under such circumstances it is feasible that passage tombs could have been utilized by not only 'specialists', but the wider community to engage with the dead. It has been argued that passage tombs would have been extremely conducive to facilitating relatively easily induced ADC experiences over short periods of time. As outlined, preparation to engage in ADCs could have involved consultation of magico-religious practitioners, but that may not have been necessary if passage tomb architecture and art variously and recognisably referenced a three-tiered cosmology, the solar journey and Milky Way mythologies, entoptic phenomena, and were indicative of crossing thresholds. The occurrence of particular motifs and architectural elements at critical junctures would have elicited particular responses by evoking meaning and connotations, thus manipulating expectations. In addition, dark passages and chambers would have been particularly conducive to initiating sensory deprivation and triggering altered states of consciousness. In terms of inducing ADC experiences, firelight would have caused motifs to 'come to life' and allow water-filled stone basins (or other receptacles) to become reflective enhancing experiences of chamber art. In addition, the physical presence of the dead, grave goods or bearing items connected with a deceased individual could have further assisted achieving ADCs by enhancing feelings of connection.

9.4 The Boyne Valley

It has been argued that the Irish 'Birth of Maccan Óc' is in fact a variant, or contains identifiable remnants of a calendrically-anchored Indo-European solar journey myth. The manipulation of time plays an important role within this story as Nechtain/Elcmar is away from Newgrange for nine months, but perceives it to have occurred over the course of a day, as is the duration of Bóand's pregnancy. Óengus Mac ind Óc is also said to have been conceived and born during the course of a day, in fact being said to have been "begotten at the break of day and born between it and evening". Thus Maccan Óc can be said to have been both conceived and born over the course of nine months between the spring equinox and winter solstice, and over the course of a day at mid-winter itself, linking the daily and yearly solar journeys. However, it should be noted that a distortion is apparent in Bóand's, pregnancy taking place during the day rather than at night. It is also notable that the connection between the daily journey of the sun (and by extension the yearly cycle) and external time is highlighted in the accounts of how Óengus gained possession of Newgrange, as he was granted the mound for a night and a day but took possession of it, declaring that night and day are equivalent to eternity as they make up the whole of existence. The connection between aquatic 'serpents' and the daily solar journey is elucidated in Egyptian mythology, where it symbolized the umbilical cord during the night-time portion of the journey, with more widespread allusions to this idea being contained in myths recounting the slaying of an aquatic beast by a manifestation of 'solar power' to create order/ fertilize the earth. In this context, although direct reference to such 'serpent slaying' is absent from the Maccan Óc tale itself it is notable that it is nevertheless directly connected with the Boyne Valley in tale of the slaying of Mata Murisc (Mátha) at Newgrange, perhaps indicating a further remnant of the solar journey myth.

It has been possible to highlight a number of interactions between the Boyne Valley as a liminal location and the architectural representation of 'journey of the sun' mythology and the three-tier division of the cosmos symbolically and iconographically. In terms of 'solar journey' iconography, the potential occurrence of boat symbolism is particularly notable and even without referring to the possibly contentious 'crewed' or other potentially stylized boat representations (at all three sites), there are quite convincing "empty" vessels among the repertoires of Newgrange 1 (1 example), Knowth 1 (8 examples) and Dowth (1 example) and a number appear to "carry" solar symbols. It has been argued that the examples at the eastern entrance at Knowth 1 (k10, k12) represent a 'day-ship' and 'night-ship' carrying potential 'solar-spirals' and the paired and opposed motifs on k86 could similarly represent day- and night-boats. The night-ship on k68 carries a 'solar concentric-circle', as does the day-ship on the outer face of the basin stone from the eastern tomb at Knowth, while the internal day-boat (possibly night-boat) carries a 'solar-circle'. It is also feasible that the Newgrange 1 example (k51), another day-ship carries a 'solar-spiral'. In addition, the possible day-boat in Dowth North (c19) occurrs below both a quadrangle and a possible 'bow' and recalls a similar composition in the Table des Marchands in Brittany and can be interpreted in terms of tri-partite cosmology as a Milky Way/rainbow motif above a representation of 'land' and an 'empty' boat. These interpretations perhaps add support and further contextualize Hensey's suggestion that boat symbolism may have been associated with the 'coracle-shaped' basin in eastern passage of Knowth 1, and the pair in the eastern recess of Newgrange 1 where the upper stone would appear to 'float' on the lower if water-filled.

Further possible references to 'solar journey' and 'aquatic beast/serpent slaying' may also be present, although the current author is unconvinced by Hensey's interpretation of 'cross-hatching' and 'herringbone' designs at Newgrange 1 in terms of marine symbolism. However, Hensey has built a strong argument for the identification of a humpback whale representation in the chamber of the western tomb at Knowth 1 (orthostat 41). Robin has identified serpentiform motifs with distinct 'heads' at Newgrange 1 (6 examples), Knowth 1 (6 examples) and Dowth (2 examples), as well as figurative 'arboriform' motifs at Newgrange 1 (5 examples) and Knowth 1 (2 examples). Integration of these motifs into identifiable representations of tri-partite cosmology includes 'arboriforms' resting directly on natural horizontal cracks at both Newgrange 1 (k4), Knowth 1 (West: co37/38) and serpentiforms depicted below 'arboriforms' at Newgrange 1 (c3, rs3). More complex compositions illustrating the same idea also occur at Newgrange 1 (k4) where a 'solar-spiral' variant is depicted below the 'arboriform' resting on a horizontal crack and k51 which features both a serpentiform and a boat carrying a 'solar-spiral' (possibly beginning emerge above the 'horizon') on the lower plane and on the upper plane an 'arboriform', a 'solar-concentric circle' and a 'meandering line' (possibly a serpentiform or even a stylized avian image).

It has been advanced by Brennan (and others) that the true significance of the large Boyne Valley passage tomb alignments as a group are that they mark the movement of the winter solar cycle from equinox to equinox, with particular focus on mid-winter. As outlined previously the prehistoric "economic year" is likely to have been "punctuated" by the equinoxes with the beginning of the "year" likely to have been marked by the start of the lunar month falling closest to the vernal/spring equinox, with celebrations possibly connected with the associated solar rising and setting (years end being associated with the lunar month closest to the autumn equinox). In this context, the Knowth alignments around the equinoxes (and potentially Dowth North around beginning of spring and end of autumn) may be connected with the turning points of the economic calendar. The beginning of the "ceremonial or religious year" is likely to have occurred with the sun's "(re-)birth", and connections between this and Newgrange and Dowth South mid-winter sunrise and sunset alignments may be advanced. It is also notable that alignments for both sunrise and sunset, the times that punctuate the daily journey of the sun are present at both Newgrange and Dowth. Furthermore, alignments marking both the equinoxes and the birth of the sun may be present at Dowth in the east of the valley and in combination at Knowth and Newgrange further west. It may also be advanced that the spread of the 'imprecise' Dowth South alignment from October to February could have been associated with marking the end and/or beginning of particular activities connected with the “economic calendar” (the end of crop harvesting and beginning of the sheep/goat and pig breading seasons and both the beginning of crop cultivation and the end of furrowing, lambing/kidding) or the “darkest portion” of the year.

These orientations appear to also reflect the mythology of the solar journeys and the birth of Óengus Mac ind Óc. In the context of the yearly journey, Knowth (spring equinox associated lunar month alignment) and Newgrange (winter solstice sunrise) mark the nine month period from the conception to the birth of the sun. In the context of the daily journey, Newgrange (winter solstice sunrise) and Dowth (winter solstice sunset) mark the daily conception, birth and death of the sun. In conjunction the three monuments tie together the daily, yearly and eternal journeys of the sun. Furthermore, looking at the geography of Brú na Bóinne, if it is accepted that Knowth and Newgrange are situated on one meander and Dowth another, it is particularly notable that if the Boyne Valley is flipped 180° and viewed with south as north then an additional level of symbolism becomes apparent and additional significance may be attached to the associations with Maccan Óc mythology. Not only do Newgrange and Knowth have particularly significant alignments but their mutual geographical positions and that of the River Boyne appear to correspond to those of the sun and Milky Way at the time of the spring equinox and winter solstice sunrises respectively. It is also particularly notable that in this context that at mid-winter c. 3100 BC, it would have appeared that the Milky Way “gave birth” to the sun due to its position above the horizon before sunrise.

It has been advanced that the visibility patterns identified by Davis’ viewshed analysis suggest: (a) that movement between the northern floodplain and the Knowth, Newgrange and Dowth complexes would have proceeded via the monuments on the southern banks of the Mattock; (b) that Newgrange represents a ‘hub’ for movement around the southern area; (c) that direct movement between Knowth and Dowth may have been restricted or absent; and (d) the northern banks of the River Boyne may have been a key feature of movement between the three main complexes. In addition to movements and procession around the Newgrage and Dowth complexes themselves, a number of possibilities have been proposed concerning movement around different parts of the Boyne Valley around the time of the winter solstice. Firstly, it has be advanced that directional movement between the north and south of the Boyne Valley could have involved (i) movement along the Newgrange cursus; (ii) movement along the Dowth cursus; or (iii) movement along the river/eastern periphery between the Boyne/Mattock confluence and the area to the east of Dowth. In the case of the latter route the monuments located across the valley would have been largely invisible. Secondly, if there was movement between the Newgrange and Dowth complexes, it could have followed the river along which good views of various monuments contained within both complexes are accommodated. An alternative northern route, along which views across the landscape would have been restricted, may be indicated if the possible Dowth cursus did in fact swing westwards towards Newgrange. Some possible symbolic connections between the daily journey of the sun (day-time, east-west; night-time west-east), and directional movement between Newgrange and Dowth have been advanced. The day-time journey from Newgrange to Dowth followed by a night-time return journey would result in a strange "reversal". After viewing sunrise at Newgrange movement to Dowth for sunset as the sun travels westwards would symbolically replicate the night-time solar journey. A night-time return journey would then replicate, at least in terms of direction, the day-time solar journey. In addition, if the river was followed during a daytime journey from Newgrange to Dowth then (a) the night-time solar journey would be referenced, (b) movement would be with the flow of the river, and (c) in terms of viewshed monuments would be visible. However, if a northern route was followed (a) the night-time solar journey would be referenced and (b) in terms of viewshed monuments would be invisible. It has been proposed that with Newgrange and Dowth being located on separate meanders there may be a suggestion of symbolically moving from an old to a new ceremonial or religious year over the course of the winter solstice and it is possible that some of these symbolic "reversals" were in some way tied into such an idea. If people did move around the valley on the winter solstice, it raises a question about who was observing the simultaneous sunrise and sunset phenomena at Newgrange and Dowth. If both were visited over the course of a single day then all of these alignments could not have been observed by a single congregation. This could indicate that the community was in some way divided between the two sites and the concurrent events were witnessed, or the mid-winter gathering involved an "extended" event involving the visitation of Newgrange, Dowth and other sites over the course of a number of days.

At Knowth, Dowth and Newgrange architectural evidence indicates that outdoor public ceremonies, with a particular focus on the entrance areas, were important features of calendrically scheduled communal events. It is likely that limited numbers of individuals engaged in activities in fore-court areas and entered the monuments on significant occasions with the vast majority of people gathered in "public spaces" outside the tombs. The large flat-topped tumuli would also have been conducive to considerable numbers either stationed upon or processing across them and the decorated kerbs may indicate that clockwise or anti-clockwise processions were important activities during large-scale communal events. It has been suggested in the current study that the materials used in the construction of the large tombs, with the majority potentially deriving from sources within a 20km radius around the Boyne Valley, but also a proportion from 40-50km (or more) to the north and south, could give insight into the scale of group identities connected with the region. In this context it has been advanced that alliances encompassing large social units existed and that these encompassed a core area spreading concentrically for at least c. 20km around the Boyne Valley and upriver/downriver, and involved longer-distance northward connections stretching to the areas accessible from Dundalk Bay and Carlingford Lough. With questions surrounding the timing and nature of the 'quartz façade/platform', which may have a Chalcolithic rather than Neolithic origin, it appears that based upon the materials utilized in passage tomb construction, connections may have been stronger to the north during this period. However, affiliations to the south undoubtedly existed, but it is unclear whether any significant shared group identity with the Boyne Valley-associated communities would have stretched as far south as the Dublin/Wicklow Mountains.

Building upon reinterpretation of the occupation outside Newgrange by Mount it has been argued that Grooved Ware-associated mid-winter feasting took place at the site, with the majority of this activity dating to c. 2628-2452 cal. BC. The activity at Newgrange appears similar to contemporary sites in Britain and strong parallels with the evidence at Durrington Walls have been proposed. Ethnographically and ethno-historically New-Year/mid-winter celebrations are ceremonially invigorated by the interconnected themes of regeneration, fertility and unification or communion. Although only touched upon briefly, it has been suggested that these concepts could have been emphasized by symbolic associations between the animals consumed, primarily pigs, cattle and red deer at Newgrange, and mythological connections with fertility and regeneration. It may be advanced that unification or communion of people with one another, nature and divinities would have been emphasized during this period through pre-existing associations between Brú na Bóinne and 'solar journey' mythology and three-tier cosmology on the one hand and the renewal of group identities through communal gathering on the other. In terms of the scale that Boyne Valley associated identities could have encompassed during the Late Neolithic, if the area under the "yellow bank" represents the remains of a single large-scale feasting event it has been estimated that it could have involved c. 4,800-12,000 individuals. Even though it probably represents multiple events, when Late Neolithic material from across the site is considered the MNI range from under the "yellow bank", which is conservative, could be a realistic gauge for attendance numbers for multiple large-scale events at Newgrange during the period. Such an interpretation would support a conclusion that the regional importance of the Boyne Valley and group-identities connected with the region, in addition to the significance of mid-winter gatherings at Newgrange remained salient into the mid-3rd millennium BC. In addition, although it is again uncertain if any of the individual pits considered as "closed contexts" do in fact represent single events, the material they contain suggests that smaller events at the site could have been more local in scale involving an estimated c. 100-200 or c. 200-500 individuals. Under such circumstances it could be advanced that such events may have been primarily attended by communities living within a 20km radius of the valley.

It has been advanced that the Chalcolithic Beaker complex represented a mythologically and 'theologically' invigorated supordinate identity which was negotiated regionally, and integrated into pre-existing traditions and reconciled with preceding belief systems. It has been proposed that the emergence of the Beaker-associated 'ideology' may have involved the re-modelling of deity pantheons and perhaps the widespread emergence of devotion, or even 'conversion', to a new and perhaps more complex version of pre-existing belief systems, perhaps involving the elevation of one or more deities to a more prominent positions. It has been suggested that in this context the emphasis on 'archery symbolism' could indicate 'cultic' devotion to a particular solar-related deity in the mould of Ra or Mithra(s). It has been emphasized that the latter deity provides a notable analogy, having being connected with solar symbolism, archery, hunting, the use of a dagger in cattle sacrifice, the drinking of an alcoholic beverage from a ceramic vessel, and feasting, demonstrating that ethno-historically such symbolism has been coherently affiliated with a solar deity and his associated 'cultic' belief system.

It may be argued that the appearance of the Beaker complex in Ireland represents the arrival of an 'international' supordinate identity, but its integration with preceding traditions across Europe suggests that pre-existing (sub-group) identities continued to exist following its ascension. The presence of Beaker material, including finds connected with the 'archery package', is conspicuous within and around the Boyne Valley and associated activity appears to have taken place at Newgrange c. 2494/2476-2284/2273 cal. BC. It appears that if the 'quartz façade/platform' was originally part of a Neolithic buttress or wall, then the monument could have been 'remodelled' or symbolically 'destroyed' during the later Beaker phase or Early Bronze Age prior to or at the same time as the erection of the stone circle which has been suggested to have occurred c. 2000-1850 cal. BC. However, if the quartz layer was a platform then it appears to have been a Chalcolithic construction c. 2564-2298 cal. BC, in addition to the possible 'removal' of the Grooved Ware timber circles, this could indicate a significant symbolic Beaker-associated 'remodelling' of the passage tomb locale in addition to the transformation of Boyne-associated identities. The significance of the Boyne Valley in terms of large-scale group-identity formation, calendrically associated gatherings and arguably an emphasis on 'solar journey' associated mythology during the Neolithic, suggests that acceptance of the complex within the region could have been immensely beneficial to incoming Beaker-associated groups, and this process may have been assisted by similarities, or relative compatibilities, between their ideology and pre-existing native beliefs.

9.5 Conclusion

The overarching aim of this study has been to investigate how archaeology might contribute to understanding long-term religious structures in prehistoric Europe, with particular reference to the Irish Neolithic-Early Bronze Age. It has been argued that coherent cosmological and mythological belief systems emerged and spread across Europe during the Neolithic and that these integrated ‘journey of the sun’ and Milky Way associated mythologies with a belief in a three-tier cosmos. Throughout Neolithic-Bronze Age Europe articulation of these ideas had relative chronological, regional, local, and situational changes and adaptations. These regional and chronological preferences are evident in the varying combinations of monument siting, orientation, architectural preferences and innovations utilized to convey these ideological systems. Furthermore, it has been advanced that iconographic and symbolic representations of these concepts reinforce this proposition of ideological coherency across Europe within a system that became progressively more complex during the course of the Neolithic-Bronze Age.

The current study has attempted to reconcile developments in communal commensality and group identities with developments in religion, cosmology and belief systems in the Irish Neolithic-Early Bronze Age. In this context it has been proposed that the Chalcolithic Beaker complex represented a mythologically and ‘theologically’ invigorated supordinate identity which was negotiated regionally, and integrated into pre-existing traditions and reconciled with preceding belief systems. It has been advanced that the emergence of the Beaker-associated ‘ideology’ may have involved the re-modelling of deity pantheons and perhaps the widespread emergence of devotion, or even ‘conversion’, to a new belief system, perhaps involving the elevation of one or more deities to more prominent positions. It has been suggested that the emphasis on ‘archery symbolism’ could in fact indicate ‘cultic’ devotion to a particular solar-related deity.

Consideration of both the mythology connected to Brú na Bóinne and the Neolithic-Early Bronze Age archaeology of the valley, has indicated that the “deep history” approach can be applied successfully in the pursuit of long-term coherency in the religious structures of prehistoric Europe. This particular study can new feed into wider discussion of “deep history” and the changing articulation of religious concepts over the *longue dureé*.

9.6 Prospective Directions

There is huge scope for continued investigation into the activity outside Newgrange even in the absence of renewed or targeted excavation, although such a strategy would undoubtedly prove extremely beneficial. It is clear that renewed scientific investigation is required. A radiocarbon dating programme targeting the area under the “yellow bank” in particular is required to facilitate Baysian analysis in order gain a greater understanding and refinement of the site chronology. Implementation of an isotopic programme studying the faunal material would be similarly advantageous, but a comprehensive re-analysis of the assemblage as a whole may be an impossibility due to the scattered nature of its storage and the fact that a portion of the material was never returned by Van Wijngaarden-Bakker (Ruth Carden pers. comm.). Re-analysis of the ceramic assemblage would also be desirable and a subsequent programme of residue analysis would expand understanding of the site and further aid comparison with British assemblages.

Due to space and time constraints it was not possible to follow a potential line of enquiry investigating the possible diminishing significance of the Boyne Valley as an influential interaction-hub during the first half of the 2nd millennium BC. Initial observations suggest that changing patterns of interaction associated with the movement of copper and subsequently tin may have played a role in this putative trajectory, but a chronologically sensitive GIS analysis will be required to further explore this hypothesis comprehensively.

A greater understanding of how Neolithic-Bronze Age calendars could have been structured has been achieved, but investigation has been restricted to the yearly cycle. It is clear that a nuanced and integrated understanding of how the ‘economic year’ in association with both solar *and* lunar cycles shaped prehistoric calendrical systems is required by prehistorians to begin to tease out the significance of other aspects of belief systems as these will not have been mutually exclusive concepts. In addition, further research is required to achieve a meaningful understanding of how other longer-term astronomical cycles, such as star-rising events, eclipses and the 18.5 year lunar cycle could, or would, have been integrated into prehistoric understandings of time and calendrical systems. However, it has become clear to the current author during the course of reviewing archaeo-astronomical studies, that before such complexities can be approached methodically a more detailed picture of how orientations cluster, and relate to the yearly ‘economic calendar’ or other lunar or stellar phenomena needs to be achieved. Although large numbers of European monuments have been measured, it appears that the methodology applied to TRB passage tombs holds the greatest potential to achieve this goal.

The potential for great insights to be gained through the integration of Eurasian ethno-historical mythology and cosmology with the investigation of iconographic representation in order to elucidate prehistoric belief systems has been demonstrated within the current study and the results provide a positive foundation for future research. Undoubtedly there is significant scope to gain greater understanding of chronological, regional and local variations and refinement of the theories presented may be achieved with further research.

Although outside the scope of the current study, it became apparent following the realization that the prehistoric year was probably divided into two separate calendars, the 'economic' and 'ceremonial/religious' respectively, and engagement with ethno-historical mythology that it is highly probable that each calendar was associated with a separate solar deity. While reviewing Eurasian cosmology in particular, it became apparent that solar deities directly connected with the 'economic year' with its turning points in spring and autumn were independent of solar deities connected with the winter solstice and 'ceremonial/religious' year. It is possible that these sun-gods of the 'economic year' may have been associated with deer symbolism (deer motifs being particularly notable in Iberia and the Alpine regions for example), but such a proposition could only be investigated though comprehensive study.

It was advanced in the current study that different ways of depicting the sun could have been used to represent different 'versions' or 'aspects' of it, such as the day or night sun, the sun on its yearly journey, the mid-winter sun, the sun associated with the dark or light half of the year, the sun as connected with different seasons, or even the sun of 'infinite' or 'mythical' time. It may be possible to investigate this suggestion, but it may only be possible to investigate such a possibility on a European scale and both regional and chronological preferences could complicate such a study significantly.

It has been advanced in the current study that the Beaker complex represented a mythologically and 'theologically' invigorated supordinate identity. It has been suggested that its associated 'ideology' may have involved a re-modelled pantheon and perhaps the widespread emergence of devotion, to a new and perhaps more complex version of pre-existing belief systems, perhaps involving the elevation of one or more deities to more prominent positions. It has also been proposed in this context that the emphasis on 'archery symbolism' could indicate devotion to a particular solar-deity who gained 'cultic' significance. There is significant potential to investigate 'archery symbolism' in much greater detail across the Beaker world and in regional manifestations and it may be possible to investigate other 'burial personae' from similar perspectives.

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