

False oat grass tubers in cremation deposits of the British Bronze Age: food, fuel, or something else entirely? An examination of the significance (or lack thereof) of

Arrhenatherum elatius* var. *bulbosum



by

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Chapter 1 – Introduction and literature review

1.1 Introduction

1.1.1 *Arrhenatherum elatius* var. *bulbosum*

The false oat grass (*Arrhenatherum elatius* var. *bulbosum*) plant is an unsuspecting one. As both a perennial and native plant of Britain, it is commonly found growing at busy roadsides and on abandoned fields. The fluffy spikelets of the plant inflorescence are still a common sight across Britain today, sometimes plucked idly by passersby, often ignored altogether. The tall tufts and variegated blades of grass belie its gnarled, onion-like tubers, which grow underground in neat links. False oat grass can often blend in amongst the multitudes of other grasses that grow in Britain, even to the modern archaeobotanist, though this is slowly changing. Since the late 1980s, identification and quantification of false oat grass tubers has become increasingly commonplace. Particularly in Britain, the immense generation of data by the industry of commercial archaeology has the potential to provide insight into the persistence of these tubers in the archaeological record.

1.1.2 False oat grass and the archaeology of later prehistory

Since 1990, with the surge in archaeological excavations in Britain after the passing of Planning Policy Guidance 16 by the government of the United Kingdom, large amounts of data have been generated and become varyingly available to interested parties. In the final quarter of the twentieth century, the nascent commercial archaeology industry began to use recent technological advancements in equipment and communication to implement and share the results of excavation, including that of bulk (or whole earth) sampling, processing, assessment, and analysis. Similar works are also often undertaken elsewhere in Europe, allowing British findings to be compared with those from areas of similar climate. An exhaustive study of deposits of all kinds from across Europe found false oat grass tubers to be particularly present in cremation deposits of the Bronze Age, and Britain was no exception to this (Roehrs *et al.*

2013).

It is notable that the number of cremation deposits containing false oat grass tubers peaks during the Bronze Age. In Britain, this period is vast, spanning from 2600 BCE to 700BCE (Forum on Information Standards in Heritage 2026). The Bronze Age is typically considered a continuation of the social, economic, and technological change of the preceding Neolithic period (Thomas 1991, p. 10), marking a more distinct transition away from a nomadic lifestyle reliant upon foraged foodstuffs and the hunting of wild animals to a more sedentary, agricultural one (Pearson 2005, p. 10-11; Çilingiroğlu 2005, p. 1-2). The intensification of processes of land ownership and demarcation undoubtedly affected the ways in which the remains of the deceased were treated, likely with increasing value in the ownership of land. Cremation became the preferred mortuary practice during the earlier part of the Bronze Age (Brück 1995, p. 245), becoming less prevalent in the later part of the period (Caswell and Roberts 2018). Changing land use patterns allowed more sedentary peoples to mark (and likely revisit) the areas of land in which their deceased kin were interred, indicating a degree of spirituality in this practice. Despite representing multiple choices (whether spiritual, technological, or for other reasons, as we will discuss) made in their selection, little has been written on the selection of different plant species for use in the cremation pyre in Bronze Age Britain. Three theories as to the presence of false oat grass tubers in cremation deposits of the British Bronze Age prevail and will be examined here: the presence of the tubers as food, as fuel, and as archaeological background noise.

1.2 Literature review

1.2.1 Food

1.2.1.1 False oat grass tubers as food

The foraging of false oat grass tubers for use as food was first proposed by Godwin (1956, p.

404), who noted the presence of fifty false oat grass tubers alongside grains of barley in a Late Bronze Age ditch from Rockley Down, Wiltshire. This site is the first known site in Britain to produce identifiable specimens of the tubers dating to the Bronze Age (Allison and Godwin 1949). Though his conclusion was not as decisive as others may have perceived (Pfitzenmeyer 1962, p. 244), it was this theory that instigated the examination of false oat grass tubers (and other tubers) as a possible foraged foodstuff of prehistoric Britain. In the years following the investigation undertaken by Robinson (1988, p. 102) into the significance of the tubers in a Bronze Age cremation deposit excavated at the site of the Rollright Stones in Oxfordshire, their use as a foodstuff is rarely entertained by modern archaeobotanists. The taste of false oat grass tubers has been investigated in recent years, with experimental work finding the tubers to be unpleasant to the modern palate (Effenberger *et al.* 2021), producing a bitter and starchy taste. Instead of tubers, recent discourse surrounding foraged plant foods tends to instead discuss the consumption of plants more palatable to modern tastes, such as hazelnuts (Moffett *et al.* 1989). This does not necessarily mean that tubers were not harvested for human consumption at some point during British prehistory, regardless of our modern palate. Examining the discourse surrounding the archaeological presence of tubers of similar plants may elucidate the possible use of false oat grass tubers for human consumption.

1.2.1.2 Other tubers as food

It is possible that the tubers of other plants were harvested for human consumption or for ritual food offerings during the British Bronze Age, though some are often considered more likely than others. The presence of pignut (*Conopodium majus*) tubers alongside those of false oat grass in a cremation deposit of the Bronze Age was first noted by Moffett (1991, p. 190), who could not rule out the collection of the tubers as a foodstuff due to their presence in a ritual (rather than a domestic) context. The author also theorised that pignut tubers may have been intentionally placed within the cremation deposits due to the skill that is required to separate them from their

delicate stems. False oat grass tubers are not so difficult to retrieve, often staying attached to their stems when uprooted by hand (Robinson 1988, p. 102). Unlike the aforementioned experimental work undertaken by Effenberger *et al.* (2021), tubers of pignut have been referred to as a “delicious” prehistoric food stuff in recent history (Dimbleby 1978, p. 31). With a taste more akin to peanut than starchy potato, the taste of pignut tubers is certainly more familiar to the palate of the modern archaeologist. “Grubbing” for pignuts was even a popular activity in the British countryside as recently as the early twentieth century, allowing for the foraging of what was once “one of the most popular of wayside nibbles” (Mabey 1989, p. 100).

1.2.1.3 Tubers as possible ritual food offerings

Beyond Britain, examples of tubers as possible ritual food offerings within inhumations have been examined, though these rarely date to the Bronze Age or have been recovered from cremation deposits. First noted alongside tubers of false oat grass in graves of Iron Age Sweden (Engelmark 1984, p. 91), large amounts of dropwort tubers (*Filipendula vulgaris*) were recovered from an inhumation of Viking Age Denmark, likely placed within the burial as a ritual food offering to the deceased (Jelicic 2020, p. 13). These tubers have been used historically throughout Europe as a folk medicine, with modern pharmacological research finding them to have anti-inflammatory and gastroprotective qualities (Samardžić *et al.* 2017). Though such findings cannot be simply transposed onto British archaeology, the harvesting of these tubers for alimentary purposes is of note, particularly as trends in the occurrences of false oat grass tubers in Denmark are similar to those of Britain (Roehrs *et al.* 2013).

If gathered as a foodstuff, it is possible that tubers of false oat grass may similarly be present in some Bronze Age cremation deposits as a ritual food offering. While there is little evidence or discussion of such a practice in the later prehistory of Britain, the burning of plant food offerings during the Bronze Age in a non-funerary context has been recorded in the region of the eastern

Alps, including that of nutshell, legumes, fruits, and cereal grains (Außerlechner 2021), with similar offerings being recovered from Roman cremations in northern Italy (Rottoli and Castiglioni 2011). Despite the geographical and temporal distance of these examples in relation to the British Bronze Age, it is feasible that edible plants were incorporated into the cremation pyre during Bronze Age Britain as an offering of food to the deceased. Further research into the role of wild plant foods in the Bronze Age is needed to better understand this. Yet, with animal-based foods likely becoming more accessible to many in Britain during the Bronze Age due to the intensification of animal husbandry (Esposito *et al.* 2025), the presence of non-human animal bone fragments feature predominantly in the analysis of food waste or ritual food offerings of Bronze Age Britain, particularly when examining supposedly higher-status rituals (Allen *et al.* 1995, p. 185). While not forming as large a part of the diet as they once did in earlier prehistory, it is likely that foraged foods still supplemented the diet of the peoples of the British Bronze Age (Monckton 2011, p. 80; Stevens and Fuller 2012) and may have even functioned as nutritional reminders of the ancestral heritage of the living. As a result of this, it is possible that the likes of hazelnut shells, tubers, and some wild fruits (such as sloes) are present in some cremation deposits of the British Bronze Age as a result of being placed amongst the cremation pyre as a ritual food offering to the deceased.

1.2.1.4 Commensal rituals in the British Bronze Age

Similarly, false oat grass tubers may be present within some cremation deposits as food waste from feasting associated with the funerary rite. However, while there is evidence of feasting during the Late Bronze Age involving the consumption of pig, sheep, and cattle flesh, there is no evidence to suggest that plant foods were used for such a ritual (Esposito *et al.* 2025). Despite this, it appears that more abstract alimentary or commensal associations were present to varying degrees in the Bronze Age cremation ritual. Some ceramic urns containing human remains from Bronze Age Britain have been identified as reused Food Vessels of the Early

Bronze Age (Wilkin 2013, p. 7), allowing for a tenuous linking of the rituals of food preparation and death. In particular reference to the preparation of plant foods for human consumption, examples of broken and burnt quern stones have been interpreted as deliberately placed cremation allegories during the Middle and Late Bronze Age (Brück 2001, p. 152). While it is difficult to find direct evidence for the link between foodstuffs and the funerary rituals of the Bronze Age, it likely existed to some degree.

1.2.2 Fuel

1.2.2.1 False oat grass as tinder for the cremation pyre

The most common theory as to the frequent presence of false oat grass tubers in cremation deposits of the British Bronze Age is that they are a byproduct of the burning of the grassy stems of the plant, which were harvested for use as tinder to light the plant material that fuelled the cremation pyre. Archaeobotanists often cite the seminal work of Robinson (1988, p. 102) when discussing this theory, in which the author observes that false oat grass tubers likely persist into the archaeological record as a result of being more fire resistant and of a higher water content than drier parts of the plant. This may also explain why the plant was selected for use as tinder, as the long, dry stems light quickly, serving this purpose effectively. The abundance of false oat grass in the open grassland environment in the Bronze Age would also render them highly accessible and far less labour intensive to harvest than other, heavier plants also commonly used for this purpose. Despite this practicality, there is evidence to suggest that tinder and the act of fire-lighting was of some significance to the funerary ritual. A significant number of inhumations from across Britain during the Early Bronze Age have been found to contain flint tools used for lighting tinder, perhaps as a means to guide the deceased through a cold and lonely afterlife (Teather and Chamberlain 2016). Examining smaller fragments of charcoal (such as twig wood and some round woods) alongside identifying their species may provide insight into the possibility of tinder identification, as it is possible that these may also have been used

as tinder or kindling for the cremation pyre.

1.2.2.2 The supplementation of the pyre flame

While it has not been previously posited elsewhere, the presence and quantity of false oat grass tubers present within a cremation deposit may vary depending upon the type of wood charcoal present. False oat grass may have been used to supplement inferior fuelwoods, often those of a lower calorific value. While oak (*Quercus* sp.) charcoal is the most common high calorie wood species recovered from fire-related deposits of many time periods within Britain (Gale and Cutler 2000, p. 205), different ecosystems and the species of wood available within them pose limitations on the material available for use as fuelwood. While high calorie wood species, such as oak and ash (*Fraxinus excelsior*), would also have been used for this purpose during the Bronze Age (Sutton *et al.* 2025, p. 16), it is evident that other, lower calorie wood charcoal species and plant remains were also used to light, fuel, or maintain the flame of the cremation pyre, likely depending upon species availability or unknowable cultural reasons (O'Donnell 2016). Campbell (2007, p. 31) theorised that the species of wood charcoal fragments recovered from Bronze Age cremation deposits varies depending upon the age or sex of the deceased, with a single taxon of wood charcoal being more commonly used in the cremation pyre of infants and adults and wood charcoal of mixed taxa more commonly used for children. Further research is required to test this hypothesis and to understand if there is such a link between the use of other plants in cremations, such as the use of false oat grass. It is possible that the presence of false oat grass tubers will also vary depending upon a number of factors, perhaps the age or sex of the individual.

1.2.3 Archaeological background noise

1.2.3.1 False oat grass tubers as an incidental inclusion

The phrase “archaeological background noise” has been used to describe plant remains

present in the archaeological record as a result of “nearby settlement activity” (Allen *et al.* 2008, p. 296), likely as a form of residual, domestic waste or as incidental inclusions from plants growing in the area of a deposit. While cremation deposits are not domestic contexts, it cannot be ruled out that changing land use patterns over the period may have resulted in some incidental incorporation of domestic waste or surrounding vegetation into such deposits, including that of false oat grass tubers. Treating the presence of certain plants as archaeological background noise implies a lack of intentionality as to their incorporation into a deposit, indicating that the plants were of little apparent use at the time of deposition. The phrase has been used here to examine the ways through which false oat grass tubers may be unintentionally present within a cremation deposit yet may still be capable of providing insight into the relationship between the individuals tending the cremation pyre and the surrounding environment.

1.2.3.2 False oat grass as a byproduct of agricultural practices

In some (often older) discourse, false oat grass is dismissed as merely a “troublesome weed of chalk downlands” (Paradine 1981, p. 23). While there is likely a geological and ecological correlation in the occurrence of false oat grass, the effective colonisation of arable crops by the plant may partly explain why the tubers of the plant frequently persist into the archaeological record. As the grassy stems would grow alongside (or perhaps even intertwined with) valuable cereal crops, their simultaneous harvest would have proved difficult to avoid. As the growth of false oat grass likely did not hinder the growth of crop species or their abundance (Roscher *et al.* 2009, p. 44), the grass may have been allowed to grow unimpeded on arable land. As ploughing or uprooting the plant by hand would have broken and dispersed the chain-like propagules further (Murphy and Mytum 2011, p. 297), their dispersal may have been aided by some methods of harvest. An example of the possible collection of false oat grass as a byproduct of the harvesting of cereal grains is present within Iron Age deposits at Nettlebank Copse,

Hampshire, likely as a result of the plants being uprooted by hand (Roehrs *et al.* 2013, p. 12).

This dissertation will examine the presence of cereal grains alongside false oat grass tubers within cremation deposits to better understand the extent to which they may occur as residual domestic waste.

The false oat grass plant would have persisted in parcels of arable land from which grazing animals were excluded. The transition from shifting cultivation to small-scale subsistence during the period is evidenced by the supplanting of many perennial weeds (such as false oat grass) by their annual counterparts (de Vareilles *et al.* 2021, p. 949). This shift saw the increased grazing of animals, which may partly explain why false oat grass tubers become less frequent in the archaeological record after the Bronze Age. The grazing of the likes of sheep and pigs (Serjeantson 2007) and large ungulates would effectively eradicate such grassy stems within the area. Small-scale subsistence reduces the presence of grasses and herbs yet facilitates the persistence of scrubby plants such as blackthorn (*Prunus spinosa*) and hawthorn (*Crataegus monogyna*) as these plants are typically ignored by grazing animals (Vera 2018, p. 187). The grazing of animals also appears to have been excluded from monumental areas during the Bronze Age (Robinson 1988, p. 102).

1.2.3.3 False oat grass as an environmental indicator

As false oat grass is native to Britain and grows under a variety of environmental conditions, from “waysides, hedgerows...rough and waste ground” to “maritime sand and shingle” (Stace 2010, p. 1018), it is not surprising that its tubers have been recovered from a variety of archaeological deposits and time periods from across in Britain. From the above examination of the discourse surrounding false oat grass, it is evident that the different species of charred seeds that occur alongside the tubers will also provide further insight into the growing conditions of the plant, likely as part of an open grassland environment from which animals are

excluded. Research has found the types of plants growing within a grassland environment to affect the density and availability of other plants within the area, with increased grass cover facilitating the growth of tuberous plants such as the aforementioned dropwort plant (Franzén 2001, p. 413).

Chapter 2 – Methods statement

2.1 Aims and objectives

2.1.1 The aims of the dissertation are to:

1. investigate the high amounts of false oat grass tubers in cremation deposits of the British Bronze Age.
2. understand trends in the accompanying data (artefacts, ecofacts, and interpretive data) of relevant cremation deposits.
3. understand the role of false oat grass tubers in cremation deposits of the British Bronze Age.

2.1.2 The objectives are to identify:

1. Why do occurrences of false oat grass tubers peak during the Bronze Age?
2. Why are the vast majority of these occurrences cremation deposits?
3. What does the artefactual data recovered from these deposits tell us about the presence of false oat grass tubers?
4. What the ecofactual data recovered from these deposits tell us about the presence of false oat grass tubers?
5. What does more interpretive data tell us about the inclusion of false oat grass tubers in cremation deposits?
6. How might we understand the use of false oat grass as fuel for the cremation pyre?
7. Does the presence of false oat grass tubers in cremation deposits provide insight into commensal rituals of the time?
8. Does the accompanying data from cremation deposits provide insight into the incidental inclusion of false oat grass tubers (referred to as archaeological background noise) within the cremation deposits?

2.2 Methodology

2.2.1 Building the dataset

2.2.1.1 Defining relevant sites and deposits

Before explaining the methods used to find relevant sites for the dataset, it is pertinent to define when and how sites qualified for synthesis. The dataset compiles all Bronze Age cremation deposits from a site that produced at least one cremation deposit containing at least one tuber of false oat grass. Sites qualified for synthesis within the dataset even if only a single cremation deposits contained a tuber of false oat grass. Despite this, not all sites meeting these criteria

were included within the dataset. Sites were included only if they provided details as to the types and quantities of at least one other type of ecofactual data. This was done to ensure that the dataset was comprised of sites producing varying quantities of false oat grass yet also allowed for the examination of any possible trends. Sites were included within the dataset even if deposits were low in number or diversity of taxa present in ecofactual data (such as archaeobotanical remains or wood charcoal fragments) yet were not included if detail was lacking altogether. If sites were large in scale and spanned multiple areas, only the areas that had at least one cremation deposit containing at least one tuber of false oat grass were included within the dataset.

Further to this, all cremation-related deposits (such as dumps of redeposited pyre debris) were synthesised within the dataset upon the condition that they contained at least one fragment of cremated human remains. This was to ensure that only material directly resulting from the cremation ritual was assessed. This distinction has been made here to lessen the ambiguity that can occur when discussing cremation deposits (typically referred to as simply a ‘cremation’) in common archaeological parlance. McKinley (1997, p. 130) noted that cremation itself (which is the act of burning the deceased on the pyre) cannot be directly excavated, but its remnants can. McKinley (2004, p. 10) later proposed four types of cremation deposit: pyre sites, burials, redeposited pyre debris, and cremation-related deposits. Deposits of each of these types are included within the dataset if originating from a relevant site as aforementioned.

2.2.1.2 Plant nomenclature

It is also important to clearly define which plant we are here referring to as false oat grass, as the nomenclature of plants of the *Arrhenatherum* genus can lead to confusion. The false oat grass plant referred to in this dissertation is the *bulbosum* subspecies of the *Arrhenatherum elatius* plant, typically referred to as either “onion couch grass” or “false oat grass” in the English

language. Some publications use botanical author citation to specify the subspecies, referring to the plant as *Arrhenatherum elatius* (L.) P. Beauv. ex J. Presl & C. Presl.

Despite the more common use of the term onion couch grass by archaeologists, the plant will be referred to here as false oat grass. This has been done to ensure that the subspecies examined is distinct from the *Arrhenatherum elatius* plant, which is also often referred to as onion couch grass. To ensure consistency in plant identification within the dataset, the original publication of each site was examined carefully to ensure that the subspecies of the plant was present. In order to achieve this, it was ensured that the *bulbosum* subspecies or botanical author citation was given. Instances lacking these qualifiers were not included within the dataset.

2.2.2 Finding relevant sites

2.2.2.1 The work of Roehrs *et al.* (2013)

To begin compiling the dataset (which can be seen in Appendix One), relevant sites were first extracted from the list compiled by Roehrs *et al.* (2013), in which Bronze Age sites from Britain detailing cremation deposits that contained false oat grass tubers were specified. The original publications from these sites were sought out using the bibliography of the publication, with all other relevant and available details of cremation deposits being synthesised within the dataset. Due to the age of some of these sites, finding some of the publications was difficult, often as they were inaccessible due to a lack of digitisation. Some digitised documents required processing via Optical Character Recognition (OCR) to allow the document to be searched. All relevant sites were located, and their accompanying data extracted and synthesised within the dataset.

2.2.2.2 Searching online databases

To begin building the dataset beyond this, the websites of the Archaeology Data Service (ADS)

and of Heritage Gateway were searched to find relevant sites. The former proved the most productive, with its search function allowing the user to navigate vast swathes of both published and unpublished literature. The search was focussed using the website search filters pertaining to time period (“Bronze Age”) and keyword (“cremation”), producing one hundred and eighty-seven results at the time of writing this dissertation. Each document was then combed through to check for at least one cremation deposit containing false oat grass tubers. If this was the case, the cremation deposits from the site were detailed, including the artefacts and ecofacts present within the deposit, and added to the dataset.

The ADS website was also used to manually sort through publications by organisation to find sites from underrepresented regions. As the search of the ADS grey literature library produced few results from the midlands or north of England, organisations pertaining to those regions were prioritised. The *Transactions of the Leicestershire Archaeological and Historical Society* were particularly useful due to their accessibility, producing a handful of sites for the dataset. Similarly, the publications of archaeological units that operate in these two underrepresented regions were also examined, producing a small number of sites that did not use the metadata terms (or metadata at all) of the initial ADS search.

The websites of large organisations were also searched for relevant sites, often providing extensive digital libraries otherwise absent from the ADS website. The online libraries of Oxford Archaeology and Historic England were used to input controlled keywords into the website search engine. These sites could not be filtered by time period, instead being filtered by documents containing the controlled term “*Arrhenatherum elatius*” as inputted into the search bar of the website, with only those of the *bulbosum* variety being added to the dataset. This search produced a variety of results, including book chapters, reports, and monographs, many of which were added to the dataset. Relevant sites were also recommended by colleagues from

within environmental archaeology, leading to the addition of a small number of areas from the A14 project to the dataset. Some sites from the regional reviews undertaken by Historic England were also added, though, at the time of writing this dissertation, the updated review for the south of England was not yet available (Hall and Huntley 2007; Carruthers and Hunter Dowse 2019).

2.2.3 Building the dataset

2.2.3.1 Extracting the data

Adding sites and their relevant cremation deposits to the dataset was done by creating three different categories of data to extract: artefactual data, ecofactual data, and interpretive data. Artefactual data encompassed materials which archaeologists often refer to as finds, such as a ceramic or organic urn, grave goods (such as pottery fragments, metal objects, beads, and worked flints), and non-human animal bone fragments. Ecofactual data pertained to the presence and amount of false oat grass tubers, pignut tubers, hazelnut shell, charred seeds, and cereals. If more uncommon plant remains were present within one of the cremation deposits, the comments feature of Microsoft Excel was used to note this. Where available, details of charcoal species and amounts were also added to the dataset. Some detailed charcoal in amounts or only for selective deposits, and these were also added. A question mark was added if the presence or absence of a type of artefactual or ecofactual data could not be discerned. Interpretive data record was also recorded, extracted from descriptive information provided within the original publication, such as the location of the cremation deposit in relation to other features or landmarks, the identified age and sex (where possible) of the deceased, and the weight of cremated bone present within the deposit.

Once each deposit was fully synthesised within the dataset, it was given a Unique Cremation Deposit Identifier (UCDI) for ease of reference within the later text of this dissertation. The first

letter of this identifier varied depending upon the region the deposit hailed from, with deposits from the north being given the identifier of NCD (northern cremation deposit), deposits from the midlands being given the identifier of MCD (midlands cremation deposit), and cremation deposits from the south being given the identifier of SCD (southern cremation deposit). These UCDIs were then numbered in order of their addition to the dataset (sites were added simply as they were found) and in numerical order within their site, with the count for each region beginning at one.

2.2.4 Examining the data

2.2.4.1 Calculating averages and creating figures

Once all relevant and available cremation deposits were fully synthesised within the dataset, an examination of possible trends could be undertaken. The number of deposits containing false oat grass on each site was examined within a site to begin. The total number of deposits containing a particular type of data (such as the number of cremation deposits within a site containing metal objects) was quantified at the bottom of each site, alongside an average value of cremated bone weight. The creation of these values will allow for comparison between cremation deposits and sites. To allow for comparison of trends between cremation deposits containing false oat grass tubers and those lacking them, two forms of the dataset were created: one comprised solely of cremation deposits containing false oat grass tubers and one comprised solely of cremation deposits lacking false oat grass tubers. This facilitated investigation into possible trends in the composition of cremation deposits and how this may relate to the presence of false oat grass tubers. Results and trends will be discussed in the coming chapters of this dissertation, illustrated by figures (mostly graphs) relating to different types of data (see Figures).

Chapter 3 – Results

3.1 Ecofacts

3.1.1 Charred plant remains

3.1.1.1 False oat grass tubers

Forty-five sites from three broadly-defined regions (the north, the midlands, and the south) of England were synthesised within the dataset, detailing the different types of data recovered from six hundred and ninety-eight cremation deposits overall. Approximately twenty percent of all synthesised cremation deposits contained at least one tuber of false oat grass. A total of one hundred and forty-one cremation deposits contained tubers of false oat grass, with their regional variation depicted in Figure One. Overall, tubers were more common in cremation deposits from the south of England, with moderate amounts in the midlands, and very few examples from the north of England.

If a site produced multiple cremation deposits containing tubers of false oat grass, they were often present in greater quantities. If more than three cremation deposits on a relevant site, false oat grass tubers were typically present in around thirty percent of total cremation deposits. Sites producing low numbers of cremation deposits containing false oat grass tubers often produced lower quantities of the tubers. Sites with more than three cremation deposits containing false oat grass tubers typically showed upwards of ten tubers per deposit, with numbers occasionally reaching between thirty and sixty tubers per deposit. Two deposits were unusually abundant in false oat grass tubers. SCD240 produced one of the largest quantities of false oat grass tubers of all of the sites synthesised within the dataset, yielding two hundred and thirteen from a single cremation deposit. While the midlands produced fewer examples than the south, MCD128 also produced large amounts of false oat grass tubers, estimated within the original text as somewhere between two hundred and six hundred tubers, though the two extremes of this approximation are vast. It should be noted that these two deposits were outliers in their large quantities of false oat grass tubers, with deposits more commonly

containing between ten and fifty tubers. Many sites did not numerically quantify the number of tubers present, using terms such as “several,” “plentiful,” “numerous,” and “rich” to denote large amounts.

3.1.1.2 Charred cereal grains

Charred cereal grains were present in eighty-two of the cremation deposits synthesised within the dataset, with thirty-five of these deposits also containing tubers of false oat grass. Regional variation can be seen in Figure Three. Cereal grains were more common in cremation deposits from the south of England and more frequently recovered from cremation deposits that did not contain false oat grass tubers. Generally, cereal grains were present in low quantities (fewer than ten grains) in both types of deposit, with a small number of exceptions. Deposits containing false oat grass tubers occasionally produced larger quantities of cereal grains, such as the ten to twenty unspecified cereal grains in SCD306 and forty to fifty mostly indeterminate cereal fragments (some of which were sprouted barley) in SCD462. Cremation deposits typically produced similar quantities of false oat grass tubers, even in deposits containing larger quantities of charred cereals. SCD110 lacked false oat grass tubers yet contained fifty-one grains of spelt (*Triticum spelta*). Many of the cereal grains present in the cremation deposits were indeterminate due to fragmentation and vitrification, though barley, spelt, and bread wheat were all identified. A small amount of cremation deposits contained cereal chaff as well as cereal grains (SCD78, SCD269, SCD455-6, and MCD43), two of which (SCD78 and SCD269) also contained tubers of false oat grass.

3.1.1.3 Other types of tubers

Wild plant remains other than false oat grass tubers were present in a small amount of the cremation deposits synthesised within the dataset. Pignut tubers were recovered from fourteen cremation deposits overall, with only one of these deposits (SCD27) lacking false oat grass tubers. Regional variation in the presence of pignut tubers can be seen in Figure Four. Some

sites noted the presence of unidentifiable tubers, often recording these by their shape and quantity. Excavations at Magna Park, Lutterworth produced “oblong” and “obovoid” (Smith 2020, p. 279) tubers (MCD83), whereas some of the cremation deposits from Deeping St Nicholas, Lincolnshire (MCD112-3) recorded “ovoid” tubers (Murphy 1994, p. 77). At the Raunds Area Project, Northamptonshire, Campbell (2011, p. 662) recorded five unidentifiable yet distinctly separate types of tubers alongside those of false oat grass from F30307 (MCD26), distinguishing them as “round flat tuber”, “tuber type B”, “root tuber 1”, “root tuber 2” or “indet tuber frags”. It is possible that many of these unidentified tubers were that of pignut, the aforementioned dropwort, or lesser celandine (*Ficaria verna* Huds.), such as those found elsewhere on the Raunds site (Allan *et al.* 2011, p. 41) and likely at Magna Park, Lutterworth alongside possible cowbane tubers (*Cicuta virosa* L.) (Smith 2020, p. 279). Tubers that were not “distinctly pyriform” from Moverons Farm, Brightlingsea, Essex were distinguished from tubers of false oat grass by Murphy (1990, 3), with three different types of tubers (some of which are present in SCD429) likely corresponding to some of those identified on the Raunds site. Apart from the Moverons Farm site, deposits from sites with cremation deposits producing these unidentified tubers also frequently produced false oat grass tubers.

3.1.1.4 Nutshell

Hazelnut shell fragments were present in seventeen (SCD1, SCD271, SCD273, SCD274, SCD343, SCD344, SCD345, SCD353, SCD354, SCD356, MCD70, MCD72, MCD83, MCD128, MCD188, MCD210, NCD6) cremation deposits synthesised within the dataset, eleven of which also contained tubers of false oat grass (SCD1, SCD273, SCD274, SCD356, MCD70, MCD72, MCD83, MCD128, MCD188, MCD210, NCD6). Where present, quantities of hazelnut shell were generally low, typically consisting of one or two fragments. Deposits containing more than one or two fragments were infrequent, such as SCD273 (four fragments), MCD70 (between

seventeen and twenty-six fragments), MCD72 (six fragments), and MCD210 (three fragments).

All four of these deposits also contained tubers of false oat grass.

3.1.1.5 Blackthorn sloes

Four deposits contained a singular blackthorn sloe (SCD32, SCD287, SCD388, MCD188), with one deposit (SCD372) containing several and an “unknown whole fruit” (Clarke 2020, p. 11).

Similarly, the entire fruit of a blackthorn sloe was recovered from MCD188. The endocarp of a blackthorn sloe was present in MCD113. Three of these deposits (SCD32, SCD372, and MCD113) did not contain false oat grass tubers and three of the deposits (MCD188, SCD287, and SCD388) contained false oat grass tubers.

3.1.1.6 Charred seeds

Charred seeds were recorded in approximately sixteen percent of the total cremation deposits within the overall dataset, with the majority of these deposits (approximately sixty percent) also containing false oat grass tubers. The most common species of seeds included blinks (*Montia fontana*), ribwort plantain (*Plantago lanceolata*), fat hen (*Chenopodium album*), clovers (*Medicago/trifolium*), knotgrass (*Polygonum aviculare*), and seeds of buttercup (*Ranunculus* sp.). Seeds of the *Poaceae* family and of the *Carex* and *Rumex* genera were also common. Leguminous fragments, including those of spring vetch (*Vicia/Lathyrus*) were present in twenty-one of the overall cremation deposits, with the majority of these also containing tubers of false oat grass.

3.1.2 Charcoal

3.1.2.1 Charcoal fragments by species

Charcoal fragments were identified by species in thirty-five percent of the sites recorded within the dataset. Figure Two shows the number of cremation deposits containing identified wood charcoal species and the presence of false oat grass tubers in these deposits. As predicted,

fragments of oak were the most commonly-identified wood charcoal species throughout the dataset. In both cremation deposits containing and not containing false oat grass tubers, ash (*Fraxinus excelsior*) was the most common non-oak species, though ash fragments were more frequently recovered from cremation deposits that did not contain false oat grass tubers.

Cremation deposits containing false oat grass tubers produced fragments of the *Prunus* species more often than deposits that did not contain the tubers, whereas deposits lacking the tubers more often contained charcoal fragments of other fruitwoods. Fragments of alder (*Alnus glutinosa*), hazel (*Corylus avellana*), or unidentifiable alder/hazel fragments accounted for a large part of all identified wood charcoal fragments in both deposit types, upwards of sixty percent of non-oak fragments in cremation deposits lacking and containing the tubers.

Deposits containing false oat grass tubers more commonly contained charcoal fragments of non-oak species, accounting for half of the overall identified assemblage from these deposits.

Non-oak fragments from the deposits lacking false oat grass tubers accounted for around forty-five percent of the overall charcoal assemblage from these deposits.

Overall, a total of seventeen different non-oak wood species were identified from cremation deposits synthesised within the dataset, with fragments from eleven non-oak species present in cremation deposits containing the tubers and fragments from twelve non-oak species present in cremation deposits lacking the tubers. Six non-oak species were present in both types of deposits. While a slightly greater species diversity was present in cremation deposits lacking false oat grass tubers, cremation deposits containing the tubers more frequently produced fragments of non-oak charcoal. Each type of deposit produced a number of species that the other type did not. For example, the cremation deposits lacking false oat grass tubers produced small numbers of birch (*Betula* sp.), holly (*Ilex aquifolium*), ivy (*Hedera helix*), willow/poplar (*Salix/Populus* sp.), and privet/honeysuckle (*Ligustrum vulgare/Lonicera*), whereas the deposits containing false oat grass tubers produced small amounts of maple (*Acer* sp.), rose (*Rosa* sp.),

spindle (*Euonymus* sp.), hawthorn (*Craetagus monogyna*), and purging buckthorn (*Rhamnus cathartica*) charcoal fragments.

3.1.2.2 Charcoal fragments by volume

Seven sites synthesised within the dataset did not identify charcoal fragments by species, but by volume (in millimetres) or weight (in grams) of unidentified fragments. On average, false oat grass tubers were more often recovered from deposits that produced larger volumes or weights of charcoal. The average volume of charcoal accompanying tubers was around three hundred millimetres or sixty grams of charcoal, whereas the average volume and weight of charcoal in deposits that did not contain the tubers were around ninety millimetres or ten grams of charcoal. Deposits containing false oat grass tubers with the lowest volume of charcoal were SCD377 and SCD378, each recorded as containing zero millimetres of charcoal. SCD351 and SCD356 also contained fewer than ten millimetres of charcoal yet produced a singular tuber of false oat grass each. SCD306 contained the highest volume of charcoal alongside tubers of false oat grass, producing eight hundred and eleven millimetres of unidentified charcoal fragments and between ten and twenty false oat grass tubers.

3.1.2.3 Charcoal fragments by element

The element of wood charcoal present was specified by a small number of sites. The majority of deposits containing charcoal fragments identified in this way did not contain false oat grass tubers. Mature wood was present in fifteen deposits (SCD118, SCD123, SCD206, SCD341-344, SCD349-350, SCD355, SCD357, MCD52, MCD54-55, MCD57-63), four of which (SCD206, MCD52, MCD54-55) also contained tubers of false oat grass. Roundwood fragments were present in thirteen deposits (SCD103, SCD118, SCD121, SCD123, SCD220, SCD337, MCD53, MCD55-8, and MCD60-1), four of which (SCD103, SCD220, MCD55-6) also contained false oat grass tubers. Twig wood charcoal was recorded in MCD114 alongside tubers of false oat grass.

Branch wood charcoal dominated the charcoal assemblage in SCD110, which did not contain tubers of false oat grass.

3.2 Artefacts

3.2.1 Cremation urns and containers

Where present, artefacts from the cremation deposits were also recorded within the dataset.

The first artefact type synthesised within the dataset pertains to the presence of a ceramic or organic urn. Not all of the cremation deposits synthesised within the dataset contained cremation urns, with the majority lacking them entirely.

3.2.1.1 Ceramic containers

Ceramic urns were recorded in two hundred and two cremation deposits synthesised within the dataset, forty-five of which also contained false oat grass tubers. The different types of ceramic urns present in the synthesised cremation deposits can be seen in Figure Five. Deverel-Rimbury urns, associated with the Middle to Late Bronze Age (Barrett 1980), appear particularly common in both deposits containing and not containing tubers of false oat grass. Bucket urns are particularly prevalent in cremation deposits that did not contain the tubers, whereas Collared Urns are evenly present in cremation deposits lacking and containing false oat grass tubers.

3.2.1.2 Organic containers

Organic containers were also present or thought to have once been in a minority of cremation deposits. Occasionally, an organic container (such as a textile or leather bag) was thought to have been present in a cremation deposit by the author of the original text. This was dependent upon the appearance of the deposit upon excavation, such as cremated remains appearing more compact than of unurned deposits. Around twelve deposits were theorised as having once used a cloth or leather bag to inter the remains of the deceased, with a minority of these deposits also containing false oat grass tubers. Nine cremation deposits within the dataset

were thought to have once included a cloth or leather bag (SCD3, SD4, SCD8, SCD9, SCD16, SCD18, SCD29, SCD377, MCD30) by the original author, with three of these deposits (SCD4, SCD377, MCD30) also containing tubers of false oat grass.

Wooden containers were also likely present in a minority of the cremation deposits. It was suggested that the individual within SCD85 was cremated within an oak coffin due to the sheer volume of charcoal present (Taylor 1984, p. 127). This deposit was rich in false oat grass tubers. Similarly, it was suggested that SCD76 used a wooden tray or coffin for the same purpose (Boyle 1999, p. 181-2). This deposit did not contain tubers of false oat grass.

3.2.2 Pyre and grave goods

Approximately eleven percent of the cremation deposits synthesised in the overall dataset contained possible pyre or grave goods, with a variation in the presence of false oat grass tubers. Of the objects discussed below, false oat grass tubers were more recovered more frequently alongside fragments of burnt flint and beads than the other types of objects.

3.2.2.1 Worked and burnt flint

Fragments of flint (both burnt and worked) were common in cremation deposits synthesised within the dataset, often in low numbers. Fragments of burnt flint were present in ten cremation deposits, six of which also contained false oat grass tubers (SCD213, SCD269, SCD297, MCD1, MCD24, and MCD42) and four that did not (SCD333, SCD334, MCD16, MCD98). Worked flint fragments were present in eighteen cremation deposits, six of which also contained false oat grass tubers (SCD207, SCD213, SCD274, SCD356, SCD416, MCD206) and twelve of which did not (SCD333, SCD349, SCD350, SCD353, SCD354, SCD357, SCD381, SCD386, SCD421, MCD23, MCD57, and MCD133). While the majority of these cremation deposits contained small quantities of worked or burnt flint, SCD213 was an exception to this, producing two hundred

and twenty-three worked flints (including blades, flakes, and cores) and a small amount of burnt flint though it lacked false oat grass tubers. A flint striker was recovered from MCD98, which did not produce false oat grass tubers.

3.2.2.2 Pottery

Pottery sherds and pieces of burnt or fired clay (likely fragments of amorphous, poorly-fired pottery) were also recovered from a minority of synthesised unurned cremation deposits.

Fragments of pottery or fired clay were present in six deposits containing false oat grass (SCD213, SC238, SCD274, SCD297, SCD366, and MCD127) and nine that did not contain false oat grass tubers (SCD243, SCD344, SCD350, SCD374, MCD15, MCD16, MCD60, MCD65, and MCD111). Identifiable pottery fragments from the deposits containing false oat grass tubers often dated to the Late Neolithic or the Early Bronze Age, as can be seen in SCD274 (fragments of Grooved Ware pottery), SCD213, and MCD128 (both contained fragments of Beaker pottery). MCD15 was the only cremation deposit that did not contain false oat grass tubers while containing identifiable fragments pottery fragments, which were thought to date to the Late Neolithic/Early Bronze Age (Boyle 2011, p. 734).

3.2.2.3 Worked bone objects

Worked bone objects were present in both cremation deposits containing and not containing false oat grass tubers, being present in two deposits also containing the tubers in the form of a bone pin (SCD66) and bone tweezers (SCD72). Worked bone objects were also recovered from four deposits that did not contain the tubers, such as burnt antler pommel and an antler or bone pin (MCD22), a bone toggle (MCD58), and bone beads (MCD131). The worked bone object in MCD58 may be related to an organic container, perhaps as a toggle of sorts.

3.2.2.4 Beads

A small number of cremations deposits contained both false oat grass tubers and decorative

beads of various materials. Deposits containing false oat grass tubers produced beads of jet, bone, and amber (SCD70), fired clay beads (SCD73), beads of unspecified material (SCD81), beads of faience and amber (SCD210), beads of jet (SCD371), and carved bone beads (NCD5). MCD131 produced bone beads but did not contain tubers of false oat grass.

3.2.2.5 Metal objects

Metal objects were present in nine cremation deposits synthesised within the dataset. The four cremation deposits that contained both tubers of false oat grass and metal objects contained a bronze dagger (MCD169), a bronze knife or dagger (SCD72), a bronze awl (SCD73), and a copper alloy awl (SCD210). The five cremation deposits that did not contain tubers of false oat grass yet contained metal objects produced copper and bronze unspecified objects (SCD122-3), a copper-alloy rapier (SCD193), an unburnt bronze dagger (MCD22), and an amorphous lump of copper-alloy (MCD144).

3.2.2.6 Non-human animal bone fragments

Non-human animal bone fragments were present in eighteen of the cremation deposits that did not contain false oat grass tubers (SCD3, SCD10, SCD18, SCD24, SCD26, SCD30, SCD32, SCD40, SCD42, SCD47, SCD156, SCD211, MCD150, MCD196, NCD2, NCD3, NCD4, NCD5) and five of the cremation deposits that contained false oat grass tubers (SCD66, SCD212, SCD273, SCD307, and SCD416). Two of the deposits containing false oat grass tubers and animal bone fragments produced fragments identifiable to species; SCD16 (bird) and SCD273 (cow). Three deposits lacking the tubers yet containing non-human animal bone fragments produced similarly identifiable fragments: SCD18 (sheep), SCD32 (pig), and NCD5 (pig). Alongside false oat grass tubers and other indeterminate tubers, fragments of cockle shell were recorded in MCD42. This was the only recorded occurrence of marine shell synthesised within the dataset.

3.3 Interpretive data

3.3.1 Visual, spatial, and identified data

Data that was neither artefactual nor ecofactual was also recorded within the dataset. This data has been interpreted the original publication, often from the site narrative constructed by the original authors or from visual data such as site plans. While some categories of data are numerical in form, they are described here as interpretive due to variations in storage and materials that may affect them.

3.3.1.1 Dating

The dating of cremated remains was recorded within the dataset using radiocarbon dates, typological information, or a combination of both. As is often the case, radiocarbon dating was only used for certain deposits, often those that did not produce datable artefacts. While the majority of cremation deposits synthesised within the dataset date to the Middle Bronze Age, a small number were dated to the Early or Late Bronze Age. Eight deposits dating to the Early Bronze Age contained moderate to large amounts of false oat grass tubers (MCD128, MCD200, MCD207, SCD206-208, SCD273, SCD373, and SCD385 and SCD388). A number of these cremation deposits reused monuments from the Early Bronze Age (as seen at Biddenham Loop, Bedfordshire) but likely largely dated to the Middle Bronze Age. Three deposits dating to the Late Bronze Age contained moderate to large amounts of false oat grass tubers (SCD85, SCD232, and SCD293).

3.3.1.2 Age

Approximately sixty percent of the cremated remains allowed for an approximation of age of the individual upon death to be made. Almost three quarters of deposits containing false oat grass tubers had such an approximation in the original text, with around forty-five percent of cremation deposits lacking the tubers allowing such identification. Eight of the deposits containing false oat grass tubers were multiple burials of at least one aged individual, whereas

twenty-four of the deposits not containing the tubers were multiple burials containing at least one aged individual. The breakdown of ages identified in the cremation deposits can be seen in Figure Six.

3.3.1.3 Biological sex

Seventy-seven cremation deposits synthesised within the dataset allowed for an identification of the biological sex of the individual. These were often tentatively given due to high levels of fragmentation or distortion as a result of thermal exposure. Twenty-three of the synthesised cremation deposits also contained false oat grass tubers, whereas fifty-four did not contain false oat grass tubers. Trends were generally similar in both types of cremation deposit, though false oat grass tubers were slightly more common in cremation deposits containing cremated remains identified as female (see Figure Seven).

3.3.1.4 The weight of cremated bone

The weight of cremated bone present in a deposit was specified by nearly all of the sites synthesised within the dataset, with only two sites (Ashville Trading Estate, Oxfordshire and Hollow Banks, Scorton, North Yorkshire) not providing this information within the original publication. On average, false oat grass tubers were recovered from cremation deposits producing lower weights of cremated bone. The weight of cremated remains from deposits lacking false oat grass tubers were approximately eleven times heavier than those containing false oat grass tubers. The average weight of cremated remains in deposits containing false oat grass tubers from the south and midlands sites were only forty-nine grams apart, being five hundred and ninety-nine and five hundred and fifty grams, respectively. Average bone weights for deposits from the two regions that did not contain false oat grass tubers were numerically separated by over three thousand grams.

3.3.1.5 Cremation deposits in proximity to an earthen monument

Where possible, the approximate location of each cremation deposit was recorded within the dataset. The majority of sites were at least partly comprised of an area of monumentality, typically a round barrow identified by the presence of a moderate to large circular ditch. Multiple sites produced cremation deposits containing false oat grass tubers and located within or at the centre of a ring ditch associated with a barrow (SCD1-2, SCD4, SCD14, SCD19, SCD21, SCD25, SCD66, SCD68, SCD70, SCD73, SCD87, SCD206, SCD207, SCD208, SCD210, SCD233, SCD238, SCD240, SCD273-4, SCD351, SCD356, SCD373, SCD385, SCD426, MCD52, MCD54-6, MCD128, MCD157, MCD162, MCD165, MCD169, MCD200, NCD4-6). Cremation deposits lacking false oat grass tubers were more infrequently found at the centre or within the interior of mound ring ditches but did occur (SCD32, SCD74-6, SCD81, SCD88, SCD90-3, SCD95-7, SCD99, SCD234, SCD277-8, SCD347, SCD349, SCD353, SCD372, SCD380-2, SCD389-408, SCD425, MCD53, MCD57-63, MCD127, MCD129-130, MCD134-156, MCD158-MCD161, MCD163-4, MCD166-8, MCD170-8, MCD194-9, MCD201-5). Approximately thirty percent of cremation deposits positioned at the interior or centre of a mound ring ditch contained false oat grass tubers, with a minority recorded as the central cremation deposit of a ring ditch (SCD73, SCD81, SCD273, MCD52, MCD54, MCD56, MCD128, MCD206, and NCD4-6).

One hundred and three cremation deposits lay to the immediate exterior of associated round barrows, with a minority (around twenty percent) containing tubers of false oat grass (SCD234, SCD238, SCD356, SCD366, SCD431, SCD445, SCD449, SCD453-4, SCD462, SCD464, SCD467-8, MCD26, MCD30, MCD42, MCD105, MCD182, MCD186, MCD188, NCD2). It should be noted that a number of cremation deposits recorded within the dataset were from sites of a narrow area of excavation (such as that of the Kirtling Green to Wixloe Pipeline, Suffolk excavation) or other limiting site-specific spatial factor, meaning that the relative position of many cremation deposits could not be discerned.

3.3.1.6 Cremation deposits located within flat cemeteries

A minority of cremation deposits synthesised within the dataset were identified by the original authors as coming from so-called 'flat' cemeteries. These are cremation cemeteries that do not appear to have been marked by a mound or other monumental structure. Only four sites from this dataset were identified as flat cemeteries by their original authors: Glebelands, Milton Keynes, Buckinghamshire; Fenstanton Gravels from the A14 project; Jack Hill, Allithwaite, Cumbria; and Magna Park, Lutterworth. Of the one hundred and five total cremation deposits from these four sites, twelve contained tubers of false oat grass. Flat cemeteries were more often located on sites that could not excavate the full extent of the cemetery, likely as their presence in pre-excavation geophysical survey was not as distinct as that of a round barrow. As a result of this, it is possible that some flat cemeteries synthesised within the dataset are partial and not discussed in this section. Flat cemeteries at Fenstanton Gravels, Magna Park, Lutterworth, and Jack Hill, Allithwaite, Cumbria appeared in their full extent within the limit of excavation and were appropriately excavated. Deposits containing false oat grass tubers from Fenstanton Gravels (SCD183, SCD190-1) were positioned towards the centre of the burial cluster, with cremation deposits containing false oat grass tubers from Magna Park, Lutterworth lay to the north (MCD70 and MCD94) and centre (MCD72, MCD80, MCD83-5) of the burial cluster, and the singular cremation deposit containing false oat grass tubers (NCD9) from Jack Hill, Allithwaite, Cumbria positioned at the centre of the burial cluster.

Chapter 4 – Discussion

4.1 Examining the evidence for foodstuffs in the synthesised dataset

4.1.1 Synthesised evidence for the use of false oat grass as food

4.1.1.1 Evidence of false oat grass tubers alongside other possible plant-based foods

It is difficult to find direct evidence for the human consumption of false oat grass tubers as food from cremation deposits. It is feasible that tubers are present in some of the cremation deposits as a ritual food offering of sorts as aforementioned, though there has been little written in regard to this as a possible practice of the British Bronze Age. Some of the cremation deposits synthesised within the dataset contained multiple edible plants, including that of false oat grass tubers. MCD210 produced tubers of pignut and false oat grass, as well as hazelnut shell, and the cremated remains of two adults, all contained within a reused Food Vessel. There is likely a correlation between the inclusion of pignut tubers and false oat grass tubers, as they often occur alongside each other (see section 3.1.1.3 of this dissertation). Fragments of hazelnut shell are also present in many of the cremation deposits containing false oat grass tubers (see section 3.1.1.4), though more infrequently than tubers of pignut. False oat grass tubers were also present in one cremation deposit alongside barley grains and blackthorn sloes (SCD388). The small number of cremation deposits containing blackthorn sloes or other fruits that also contained false oat grass tubers indicates a lack of association in their inclusion (see section 3.1.1.5). A small amount of the synthesised cremation deposits contained a mixture of possible plant foodstuffs other than false oat grass tubers, such as multiple blackthorn sloes alongside an entire unidentified fruit and one indeterminate free-threshing cereal grain (SCD372) and barley grains, sloes, and animal bone fragments (SCD32).

It is not possible to definitively understand if any of these possible food remains were intentionally incorporated into these cremated deposits; it may be that many are present as a form of domestic waste (see section 4.3.1.4). Though understudied, there has been discussion regarding the supplementation of prehistoric grain-based diets with foraged foods, though

much of this discussion pertains to the foraging of hazelnuts during the preceding Neolithic period (Bishop *et al.* 2009, p. 89). More recent works have argued that this practice continued into the Bronze Age (Stevens and Fuller 2012), and it is posited here that there are a variety of neglected possible foraged foodstuffs that require further research as to their role in both earlier and later prehistory. Foraged foodstuffs would have been a valuable and readily-available means of staving off hunger when cereal crops failed or were not as readily available, such as towards the end of the summer (Monckton 2011, p. 80). Further research would also help to provide insight into the role of foraged foodstuffs in the cremation rituals of the Early and Middle Bronze Age.

4.1.1.2 Evidence of false oat grass tubers alongside possible animal-based foods

It is possible that fragments of unburnt, non-human animal bone were present in many of these cremation deposits as the remnants of the consumption or placement of non-human animal flesh. While only a third of the synthesised cremation deposits containing tubers of false oat grass also contained fragments of non-human animal bone, none of these also contained the previously outlined (and perhaps more likely) foraged foodstuffs. Two deposits contained animal bone alongside false oat grass tubers and cereal grains (SCD307) or animal bone fragments alongside two barley grains (SCD32). This does not make for compelling evidence of ritual offerings of meat in conjunction with foraged plant foods. However, it should be noted that McKinley (1997, 132) found only sixteen percent of one hundred and thirty British Bronze Age cremation burials to contain fragments of non-human animal bone (predominantly sheep, pig, or bird), making it likely that fragments may be present in a small amount of the synthesised cremation deposits. The fragments of cockle shell present alongside tubers of false oat grass in MCD42 were likely used for decorative purposes (Hutton 2011, 28) and are not solely remnants of human consumption.

4.2 Examining the evidence for cremation pyre fuel in the synthesised dataset

4.2.1 Synthesised evidence for the use of false oat grass as fuel

4.2.1.1 Evidence for the supplementation of the cremation pyre using false oat grass

Examining the variation in the species, element, and volume of charcoal present in both cremation deposits that contained and did not contain tubers of false oat grass provides insight into the selection of fuel for the cremation pyre. Figure Two illustrates a subtle difference in the species of wood charcoal present, with cremation deposits containing tubers of false oat grass more commonly producing charcoal fragments from wood species of a lower calorific value, often scrub and shrub species such as alder, hazel, hawthorn, spindle, purging buckthorn and rose. The most common wood charcoal species present in cremation deposits containing larger amounts of false oat grass tubers can be seen in Figure Eight, in which fragments of oak and hazel are the most common, closely followed by fragments of ash and those of the *Prunus* genus.

Cremation deposits containing false oat grass tubers produced a larger proportion (almost double) of wood charcoal fragments of the *Prunus* genus than cremation deposits that did not contain tubers of false oat grass. As many wood species belonging to this genus are inferior fuelwoods, they would have likely warranted supplementation by a higher quantity or greater diversity of plant material. False oat grass tubers were commonly recovered from samples containing larger volumes or weights of charcoal when specified (see section 3.1.1.2), perhaps indicative of their use in pyre supplementation. Yet it should be noted that modern scientific research has found some members of the *Prunus* genus to be efficient fuelwoods if appropriately prepared in a way that reduces the high-water content of the wood (Nabi *et al.* 2017, p. 3804), though there is no evidence of this practice being undertaken in Bronze Age Britain. Woods of a high-water content may be more likely to become highly vitrified upon burning and thus difficult to identify (McParland *et al.* 2010), perhaps partly explaining why many sites could not identify charcoal fragments.

It is not possible to rule out the inclusion of such species for aesthetic purposes. Due to their close relation to species of the Pomoideae family, it is possible that fragments of the *Prunus* genus were selected for aesthetic reasons, particularly in the olfactory sense. Fragments of the *Prunus* species or other fruitwoods may have been selected to supplement the pyre for this reason, masking or at least ameliorating the scent of smoky fuelwoods such as oak (Challinor 2010, p. 201). The sweet-smelling smoke resulting from the burning of particular plant remains has been used for a multitude of reasons (including purification and other ritualistic reasons) by various peoples across different time periods for millennia (Pennacchio *et al.* 2010, p. 4). While the neutral, mild scent of burning grasses such as false oat grass would have done little to mask such intense smells, it is possible that conditions that necessitated the use of the dry, grassy stems may have also encouraged the use of pleasant-smelling woods as fuel for the cremation pyre.

4.2.1.2 Evidence for false oat grass as tinder and kindling

It is of note that cremation deposits containing false oat grass tubers, while more commonly producing non-oak wood charcoal fragments than cremation deposits lacking the tubers, also frequently contained fragments of oak wood charcoal. It is likely that false oat grass tubers were generally used as tinder or kindling in the cremation pyre, regardless of the species of wood charcoal present. As the long, dry stems of false oat grass would light quickly, they would certainly have assisted fuelwoods in lighting and maintaining the cremation pyre in a “rapid conflagration” (Robinson 1988, p. 102). Though this use of the plant is logical, it is difficult to find direct evidence for this theory within the dataset, though some accompanying data is persuasive. Twigs of the *Prunus* genus were present in MCD114 alongside small amounts of fragmentary false oat grass tubers, both of which may have been used as kindling and tinder, respectively. Roundwood charcoal fragments in seventeen of the synthesised cremation deposits may be present as a result of being used as kindling or tinder, though only four of these deposits also contained tubers of false oat grass.

4.2.1.3 Evidence for a link in the use of false oat grass and the age of the deceased

As can be seen in Figure Nine, trends in the identified ages of cremated remains are broadly similar in both cremation deposits containing and not containing tubers of false oat grass. This indicates a lack of correlation between the age of the deceased and the presence of false oat grass tubers. However, it is of note that cremation deposits containing false oat grass tubers were more commonly recovered from cremation deposits containing the cremated remains of children and slightly less common in cremation deposits containing the cremated remains of adults and young adults. As this disparity is very slight, it is not possible to discern the nature of this link if there is indeed one. Further insight may be provided when examining interpretive data later in this chapter.

4.2.1.4 Evidence for a link in the use of false oat grass and the biological sex of the deceased

As can be seen in Figure Ten, there may be a link between the biological sex of the deceased and the presence of false oat grass tubers in a cremation deposit. It is notable that false oat grass tubers are more commonly recovered from cremation deposits containing cremated remains identified as biologically female, with forty percent of these also containing tubers of false oat grass. This is particularly apparent as only twenty-three percent of cremation deposits containing cremated remains identified as biologically male contained tubers of false oat grass. Yet, it should be noted that seventy-six of the six hundred and ninety-eight cremation deposits synthesised within this dataset contained cremated remains from which a biological sex could be identified: fewer than ten percent of deposits. As with identifying the link to the age of the deceased, further insight may be gleaned by examining spatial trends later on in this chapter.

4.3 Examining the evidence of archaeological background noise in the synthesised dataset

4.3.1. Synthesised evidence for false oat grass tubers as archaeological background noise

4.3.1.1 Evidence for false oat grass in proximity to earthen monuments

From the synthesised location data of the cremation deposits, it is evident that there is a link between round barrows and the presence of false oat grass tubers, particularly within the cremation deposits located within the interior of the mound itself. Furthermore, there appears to be a link between the presence of false oat grass tubers and the central deposit of a round barrow (see section 3.3.1.5), particularly as very few flat cemeteries produced cremation deposits containing false oat grass tubers (see section 3.3.1.6). Bronze Age cremation deposits situated to the exterior or away from the mound (such as isolated deposits) also rarely contained tubers of false oat grass, further supporting the theory that there is a link between the presence of false oat grass tubers and close proximity to an earthen monument (Campbell 2011, p. 653). It is unclear if there is a correlation between other aspects of a cremation deposit (such as the age or sex of the deceased) and monument proximity, and this would benefit from further research.

4.3.1.2 Evidence for false oat grass a result of land clearance

It is likely that false oat grass tubers are present in many of the synthesised cremation deposits as a byproduct of the process of land clearance that preceded barrow construction. Such a process may have included the intentional reusing of material cleared from the area in many of the cremation deposits synthesised within this dataset. This theory is supported by the increased presence of scrub and shrub wood charcoal species in cremation deposits containing tubers of false oat grass (see section 3.1.2.1), as these species would likely be cleared simultaneously. The elevated frequency of charcoal fragments of the *Prunus* species (many of which are common as shrubs [Stace 2010, p. 195]), twig woods, and round woods in cremation deposits also containing false oat grass tubers may also this recycling of material for the cremation pyre.

Material gathered through the process of land clearance may have been reused for the initial cremation rituals undertaken within the vicinity of the associated earthen monument. This would likely take place following the process of land clearance yet preceding mound construction (see Figure Eleven). It is possible that Bronze Age cremation deposits containing false oat grass tubers are more likely to be primary burials, here referring to the first cremation deposit interred within the vicinity of an earthen monument and marking the beginning of its use (Brück 1999). Contrary to this, only four of the synthesised cremation deposits were defined as a primary deposit, with only one of these (SCD274) also containing tubers of false oat grass. Further research into the nature of primary cremation burials in relation to earthen mounds and the charred plant remains present would help to elucidate the nature of this relationship. While it was once thought that internment within the barrow centre was once reserved only for high status males, the examples to the contrary (of which there are many within the dataset) possibly indicate the cremation ritual and the central burial as an indication of social levelling (Brück 2009; Brück 2015, p. 120; Fowler 2005).

4.3.1.3 Evidence for false oat grass as an indicator of turf

False oat grass tubers may be present as archaeological background noise due to the presence of the plant within detached sections of turf. Hall (2003, p. 27-28) theorised that false oat grass tubers may be an overlooked indicator of turf, alongside seeds of blinks (*Montia fontana*) and docks (*Rumex* sp.) and “other kinds of...vegetative structure”, all of which are present to varying degrees in cremation deposits synthesised within this dataset. During land clearance and subsequent mound construction, turf and the plants growing in it may have been uprooted in sections of “topsoil on which a vegetation carpet has grown” (Romankiewicz 2023, p. 7). As a result of this, plants that often grow in grassland environments (and perhaps certain geologies) would be uprooted together and redeposited when these turves were reused. The likelihood of the survival of the plant remains into the archaeological record would have been increased by the resulting carbonisation of the cremation pyre flame if they were indeed used for this

purpose. The use of turves in mound construction (as illustrated in Figure Eleven) may have also functioned as a means of maintaining the cremation pyre. It was suggested by Evans and Knight (1998, p. 77) that turves may have been thus used to 'clamp' the cremation pyre at Butcher's Rise, Barleycroft Farm, Cambridgeshire, in order to produce a 'cooker-type' pyre, resulting in a higher temperature and lower flame while increasing the efficiency of inferior fuelwoods. Turf clamping of a cremation pyre also occurred at Snail Down, Wiltshire, using material produced by the initial digging of the mound ring ditch (Jones 2005, p. 161), though the presence of tubers of false oat grass is not specified within the original text. Further investigation is required to understand if there is a link between the use of turves in this manner and the presence of tubers of false oat grass in Bronze Age cremation deposits.

4.3.1.4 Evidence for false oat grass as domestic waste

As previously referenced within this dissertation, false oat grass tubers may be present in some cremation deposits synthesised within the dataset as a form of intrusive yet benign domestic waste. Monckton (2011, p. 80) theorised that false oat grass tubers may be present in some cremation deposits as an arable weed of abandoned agricultural land later reused for religious purposes (such as the construction of a monument). This may in part explain the increased presence of false oat grass tubers in synthesised cremation deposits of the Early and Middle Bronze Age (see section 3.3.1.1), which corresponds to the part of the Bronze Age more commonly typified by cremation deposits interred at barrow mounds (Caswell and Roberts 2018). The presence of some false oat grass tubers as domestic waste in earlier deposits may partly explain their recurrent presence alongside plant remains commonly foraged in the Later Neolithic (Moffett *et al.* 1989). False oat grass may be similarly present as a byproduct of the processing of hulled grains, which was often done by exposing plant material to high temperatures (Moffett 1989, p. 7). This may partly explain the presence of carbonised hulled grains in some of these cremation deposits, both containing and not containing tubers of false

oat grass. This may be the case for SCD78, in which grains of emmer were found alongside the tubers. The low number of possible examples indicates that cremation pyres and crop processing were undertaken in separate areas, though some instances of false oat grass tubers may be present as benign and residual domestic waste of earlier periods of time.

4.3.1.5 Cremation deposit type and the presence of false oat grass tubers

It is evident from the results of this dissertation that the presence of false oat grass tubers varies depending upon the type of cremation deposit in which it is present. While the majority of cremation deposits synthesised within the dataset are cremation burials as defined by McKinley (2004, 10), a minority appear more typical of categories of cremation-related deposit or redeposited pyre material. As false oat grass tubers were more commonly recovered from deposits containing higher volumes of charcoal and lower weights of cremated bone than cremation deposits that did not contain the tubers (see sections 3.1.2.2 and 3.3.1.4 respectively), it is likely that the tubers formed part of the wider pyre material and are more likely to be present in redeposited pyre debris. In this instance, it is likely that false oat grass tubers were not purposely selected for redeposition.

It is likely that pyre material was often sorted through by hand after the cremation process, allowing for the retrieval of token deposits of human bone for later internment as possible *pars pro toto* (McKinley 2006, p. 86). Some plant materials (perhaps including false oat grass tubers) may have been selected for this purpose, as there is evidence to suggest that deposits of cremated remains were sometimes paired with deposits of redeposited pyre material (Ui Choileàin 2011, p. 157; Kennedy and Massey 2019. p. 15), possibly the material from the cremation of that particular individual. If plant material from the pyre was sorted through before redeposition, false oat tubers may have been purposefully selected as a token of unknown cultural value. Some have argued for the deposition of false oat grass tubers (similar to the ritual

deposition of tubers of the *Asphodeus* genus in ancient Greece) as a ritual deposition representing notions of fertility and reproduction (Roehrs *et al.* 2013, p. 11-12). Although this particular ritual intention is difficult to find direct evidence of this from the cremation deposits synthesised within the dataset, the deposition of false oat grass tubers may have been ritually placed for similar means in some of the deposits. SCD225, which contained false oat grass tubers, alongside other unidentified tubers, pulses, seeds of medick or clover, and fragments of fruit wood charcoal may have been a carefully selected redeposition of material associated with the timber building within which it is interred (Hart 2015, p. 99). It is tempting to interpret instances of false oat grass tubers from the interior of ceramic urns as deliberately placed for this reason, though it is not possible to discern the intention behind the possible deliberate placement of such materials.

Chapter 5 – Conclusion

5.1 Research limitations

5.1.1 Biases in identification

5.1.1.1 The destructive nature of cremation

Every piece of tangible archaeological evidence excavated from these cremation deposits has been altered upon exposure to the high temperature of the cremation pyre flame, occasionally even beyond recognition and with some pieces likely destroyed altogether. Understanding how thermal exposure affects the preservation of different ecofacts and artefacts is vital in examining cremation deposits, and archaeologists must consider how the likes of sample size (Beck and Jones 1989, p. 247) and the varying survival of different environmental remains (Wallis *et al.* 2025, p. 12) may affect materials present. Ecofacts particularly vary in their survival, with some plant parts being more capable of preservation through high temperatures instead of outright destruction. Certain species of wood have an increased likelihood of survival when exposed to high temperatures, with fragments of hazel often surviving due to the dense structure of the wood species (Moffett 1989, p. 7). Preservation through carbonisation helps to explain the persistence of tubers of false oat grass in the archaeological record, even in instances where the plant was likely harvested for use of its grassy stems.

It is not just artefacts and ecofacts that are transformed by the cremation process. Some methods of post-mortem treatment of the deceased before exposure to high temperatures may have altered the resulting cremated remains, such as excarnation or dismemberment (Curtin 2015). Exposure to high temperatures further transforms the bones of the deceased, altering their colour and structure altogether (Schurr *et al.* 2015). It is clear that identifications of age and sex should be made carefully as a result of this. Obsolete criteria thought to once indicate biological sex, such as the weight (Gonçalves *et al.* 2015) or robusticity (Macintosh *et al.* 2017) of cremated remains, are rarely still in use, though some methods of identifying the age or sex of

an individual from their cremated remains are often reliant upon the presence of certain bone elements (Ubelaker 2015, p. 155). If present, such elements have been found to allow for accurate identification of the biological sex of an individual (Kurila 2015, p. 827), though extra care should be taken to distinctly separate discussions of biological sex and socially-constructed gender norms, the latter of which is more difficult to understand given the lack of cultural context of later prehistoric Britain. Modern archaeologists should aim to avoid transposing their own *habitus* onto past peoples without stubbornly yoking perceived gender norms to biological markers of sex.

5.1.1.2 The role of science in archaeology

It is important that environmental archaeology of the twenty-first century does not become limited by the same reductionist notions as processual archaeology did before it (Earle and Preucel 1987). While it is tempting to overemphasise scientific data due to its accuracy and lack of bias, such data is only beneficial to all upon interdisciplinary evaluation and dispersal. It is apparent that a level of uniformity is still lacking within environmental archaeology. Many of the original publications examined for the data synthesis did not numerically quantify the presence of plant remains, instead using terms such as “plentiful,” “rich,” or “abundant.” While such descriptors are useful shorthand at the level of archaeobotanical assessment, they are too vague to allow for effective interpretation and comparison with other sites. Implementing uniform standards of quantification throughout environmental archaeology would certainly help to diminish this issue in a way that does not exhaust project resources unnecessarily. Beyond environmental archaeology, corresponding with colleagues of different knowledge and skill sets will only help to diminish possible scientific reductionism and construct a thorough site narrative. Examining the entirety of data (including artefacts, ecofacts, and interpretive data) present on a site or within relevant deposits provides insight that would not otherwise be

understood if only one type of data were examined. Without the (flawed) interpretation of the modern archaeologist and their colleagues, data exists in an inaccessible and irreproducible form.

5.1.1.3 Geographical bias

In the initial stages of research for the dissertation, the geographical scope was wide, with cremation deposits from all over Britain sought out for synthesis within the dataset. It quickly became apparent that the majority of deposits would come from England, with a complete lack of relevant deposits from Scotland and Wales. Further to this, it became evident that the majority of cremation deposits synthesised within the dataset were from sites located within the south of England, with a moderate amount from the midlands, and a small amount from the far north of England. It is likely that this variation is in part due to the geological and climatological growing conditions of the false oat grass, with evidence to suggest that the plant prefers the well-draining chalkier soils (Khan 1991) and warmer climate of the south of England (Michalski *et al.* 2017, p. 3271). It would be helpful to understand the relative frequency of dropwort tubers in archaeological (and possibly even cremation) deposits of the north, as this plant is “very locally frequent” in northern England and Scotland (Stace 2010, p. 241) and a possible ritualistic food offering in other countries of northern Europe as outlined in section 1.2.1.2 of this dissertation.

Yet, the recovery of tubers of false oat grass in colder countries throughout Scandinavia, the Nordics, and northern Europe indicates that this may not simply be an absence of evidence. Though very few examples of false oat grass tubers from Bronze Age cremation deposits from northern counties such as Cumbria have been found (O’Meara *pers. comm.*; see Appendix Two), it is possible that a lack of commercial excavation in such regions is contributing to this lack of evidence. As British commercial archaeology is typically developer-led archaeology, excavations often precede medium- and large-scale construction projects, such as the building of newbuild housing estates, the widening of major roads, and the creation of highspeed

railways. Many such projects are a result of increasing demands on housing and transport in the south of England and the midlands to allow for easier access to the capital city. Perhaps as a result of this, it may be that many even consider the far north of England a comparatively barren area archaeologically, particularly in terms of the archaeology of later prehistory. Understanding the extent to which a discipline as empathetic as archaeology is also plagued by issues of class prejudice is relevant here, with projects such as the recent excavations on the A66 Northern Trans-Pennine Project (Oxford Cotswold Archaeology 2026) showing that there is much yet still to be uncovered in the north of England.

5.2 Conclusion

5.2.1 Fuel, food, and archaeological background noise

5.2.1.1 Fuel

The use of stems false oat grass plant in the cremation pyre is the most compelling explanation for its presence in a preponderance of cremation deposits of the British Bronze Age. The transforming or newly transformed landscape of the Early Bronze Age would have made the plant readily-available in many countries of modern-day northern Europe, with minor tree clearance and an increase in arable land creating the appropriate conditions for its growth (French 2012, p. 35-6). The abundance of false oat grass, alongside its lightweight nature and ease of harvesting by hand likely partly explains its frequent use as tinder, though its variable presence is of note; it is perhaps not as common as originally thought. As we lack much of the cultural context for the Bronze Age, it is simpler to approach understanding the practical role of plants in the cremation ritual. The sparking and maintenance of the cremation pyre was often a labour-intensive exercise, one aided by empirical knowledge and experience and affected by variable weather conditions and seasonal plant availability. The results of the data synthesis indicate that there was likely a cultural link between the plants selected as fuel for the cremation pyre and the deceased individual during the Bronze Age, as suggested by Campbell

(2007, p. 31), though further research is required to examine this further. Identifying and comparing the charcoal species present in Bronze Age cremation deposits from around Britain would also help to widen the scope of this research and lessen its geographical bias.

5.2.1.2 Food

While this data synthesis and its subsequent discussion did not find clear support for the theory of false oat grass tubers as a deliberately-placed foodstuff within the cremation deposits, it is possible that there is a link between the cremation ritual and the consumption of food during this time period. The consumption of foraged foodstuffs during the Bronze Age requires further study, through which a more thorough understanding of the role of edible plants in the cremation rituals of the Early to Middle Bronze Age in Britain may also be gleaned. It is notable that many different edible plants frequently reoccur alongside one another in the synthesised cremation deposits, though it is not possible to know if these are a result of intentional placement. It is difficult to discern long-term habits (such as the repeated foraging of particular plants for human consumption) from short-term deposits (such as cremation deposits) (O'Donnell 2016, p. 161-2), though some links between food consumption and the cremation ritual seem intentional. This is perhaps the case in the reuse of Food Vessels as cremation urns (Wilkin 2013, p. 7). Lipid analysis of such vessels may provide insight into the nature of their reuse, though such analysis is costly. Furthermore, some lipids may not entirely survive high temperatures (Khameneh *et al.* 2025) if placed upon the pyre and exposed to its high temperatures or washed during the post-excavation process.

5.2.1.3 Archaeological background noise

The phrase archaeological background noise has been used throughout this dissertation with the aim of lessening the influence of dichotomies (wild *versus* cultivated; food *versus* fuel) that is often apparent in archaeobotanical assessment and resulting research. This is not a critique

of the archaeobotanical structure of assessment, but of the limited view many archaeologists (and may implicitly present through their writings) often take in regard to wild plant remains. While tubers of false oat grass may be present in cremation deposits of the Bronze Age as neither food nor fuel in many instances, this does not mean their presence is a worthless one. The presence of the tubers is likely partly indicative as a result of changing land use patterns, but also specific environmental interactions that require further study, such as the use of turves in the cremation pyre.

The use of turves has been briefly explored in this dissertation as a possible explanation for the presence of tubers of false oat grass in some of the synthesised cremation deposits. The examination of turves as a fuel source is often briefly referenced in studies examining the use of peat as a fuel source, with few studies separately discussing the similar value of turves (Branigan *et al.* 2015). This is perhaps partly a result of the extant practice of peat burning; the burning of turves for fuel is likely unfamiliar to many. Furthermore, the possible use of turves is more difficult to recognise archaeologically, with further research to better understand indicators of their presence required. Using scientific methods to corroborate archaeological interpretation of ecofacts and artefacts would assist in this. For example, examining the details of pollen analysis from sites may provide insight into the possible use of turves in the cremation ritual during the Bronze Age, as seen in the presence of ribwort plantain and heather (*Calluna vulgaris*) pollen at the Middle Bronze Age barrow at Linga Field, Orkney (Bunting *et al.* 2001, p. 498). Samples processed through methods other than that of bulk sample floatation, such as the micromorphological analysis of material extracted in Kubiena sampling or subsampling of larger samples, would allow for the examination of microscopic data such as diatoms and phytoliths, which may also provide evidence of the possible use of turves as a fuel source in a relevant deposit (Aldeias 2017, p. 5196).

5.2.2 Implications for future research

5.2.2.1 The case for anthracology

Environmental archaeology, despite its many insights, is an underused set of specialisms. This has become particularly evident in the case of anthracology during the course of research for this dissertation. Even though fragments of wood charcoal are one of the most commonly-found material types on archaeological sites in Britain, their basic identification and assessment is neglected by many commercial organisations working within the industry. Funding expensive methods of analysis while ignoring the wealth of information that can be gained from such a commonplace ecofact through inexpensive assessment is nonsensical. Yet it may be that charcoal analysis, and its resulting insights, are little known to many archaeologists, and further dispersal of its merits to archaeological research may see more resources allocated for its assessment and analysis.

5.2.2.2 Cultural context

Increasing the knowledge of the selection of plant remains in instances such as the cremation ritual is best ascertained through the recording and analysing of patterns of behaviour in selection. Understanding the factors which may affect this series of choices may provide insight into the cultural taboos and social norms that may have also affected this selection. More so than inhumation burials, the cremation ritual is one that requires a wealth of different choices, selections, rituals, and behaviours (see Figure Twelve) to be conducted both before and after the lighting of the cremation pyre. Some of these choices invariably result in the different ecofacts and artefacts that archaeologists recover during excavation and post-excavation processes. The details of each action listed in Figure Twelve varies for each cremated individual or pyre, with some actions undertaken and some not undertaken. As McKinley (1997, p. 130) posited, it is not possible to excavate the 'cremation' itself, but many of the choices dictating its composition result in a variety of archaeological evidence. Furthering building through synthesising and comparing our archaeological understanding of each of these actions would undoubtedly increase research capabilities into the relevant cultural context of the Bronze Age.

5.2.2.3 Plants of the past and plants of the modern day

As aforementioned, it is important that we do not transpose our own modern ideals onto the ways that the peoples of Bronze Age Britain would have interacted with their environment.

Though plant selection would have largely depended upon thermal calorific content in regard to selection for the cremation pyre, it is undoubtable that many plants were selected for more secondary reasons, such as their aesthetic qualities, seasonal availability, and currently unknown cultural reasons. Furthering our archaeological knowledge of trends in plant selection would assist in better understanding the possible cultural context for such selection, as the natural world would have formed a far larger part of Bronze Age society than our own.

It is difficult to think of a society more removed from the prehistoric world than our own twenty-first century world, one fuelled by ultra-processed, highly palatable and convenient foodstuffs.

For many of us modern folks, the majority of plant species present in the country we live in is something that we idly pass by when travelling, perhaps noticed only when they produce colourful flowers or prove useful to childhood mischief. A native, annual plant such as that of cleavers (its scientific name is *Galium aparine*, but it has many regional nicknames in common vernacular) may be fun to pluck and throw at friends as youngsters, but it is also one commonly recovered from archaeological deposits from cultivated and arable land (Stace 2010, p. 542).

These two interpretations of the plant differ from one another (one is anecdotal and the other is scientific), yet both are valid. It is for us to decide the most fitting means of interpreting the way in which past peoples interacted with plants; it may lie somewhere between anecdote and science. Sharing our own visceral experiences of plants while examining scientific data and archaeological trends is important in understanding how peoples of the past may have interacted with their own environment. If we look closely, we might find that we have more in common than we previously anticipated.

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Bibliography

- Aldeias, V. (2017) Experimental approaches to archaeological fire features and their behavioral [sic] relevance, *Current Anthropology* 58(16), pp. 5191-5205.
- Allan, A., Rault, S. and Humble, J. (2011) 'The Avenue', pp. 37-44 in J. Harding and F. Healy (eds.) *The Raunds Area Project: A Neolithic and Bronze Age Landscape in Northamptonshire, volume 2 Supplementary Studies*. English Heritage: Swindon.
- Allen, M. J., Morris, M. and Clark, R. H. (1995) Food for the Living: a Reassessment of a Bronze Age Barrow at Buckskin, Basingstoke, Hampshire, *Proceedings of the Prehistoric Society* 61, pp. 157-189.
- Allen, M.J., Leivers, M. and Ellis, C. (2008) Neolithic causewayed enclosures and later prehistoric farming: duality, imposition and the role of predecessors at Kingsborough, Isle of Sheppey, Kent, UK, *Proceedings of the Prehistoric Society* 74, pp. 235-322.
- Allison, J. and Godwin, H. (1949) Bronze Age plant remains from Wiltshire: Data for the study of post-glacial history, *The New Phytologist* 48(2), pp. 253-254.
- Andrews, P., Dinwiddy, K. E., Ellis, C., Hutcheson, A., Phillpotts, C., Powell, A. B., and Schuster, J. (2009) *Kentish Sites and Sites of Kent: A Miscellany of Four Archaeological Excavations*. Wessex Archaeology: Salisbury.
- Ashbee, P. (1960) *The Bronze Age Round Barrow in Britain: An Introduction to the Study of the Funerary Practice and Culture of the British and Irish Single-grave People of the Second Millennium B. C.* Phoenix House: London.
- Atkins, R. and Hewitt, G. (2024) A14 Cambridge to Huntingdon, Cambridgeshire: Fenstanton Gravels Landscape Block Archaeological Report. Cambridge County Council: Cambridge.
- Außerlechner, M. V. (2021) Plant use and rites at burnt offering sites in the Eastern Alps during the Bronze and Iron Ages, *Vegetation History and Archaeobotany* 30, pp. 155-170.

- Barclay, A., Glass, H. J. and Parry, C. (1996) Excavations of Neolithic and Bronze Age ring-ditches, Shorncliffe Quarry, Somerford Keynes, Gloucestershire. *Transactions of the Bristol and Gloucestershire Archaeological Society* 113, pp. 21-60.
- Barclay, A. and Halpin, C. (1999) Excavations at Barrow Hills, Radley, Oxfordshire, Volume 1: The Neolithic and Bronze Age Monument Complex. Oxford Archaeological Unit: Oxford.
- Barker, J. and Meckseper, C. (2015) *Huntingdon Road/NIAB (Darwin Green), Cambridge, Cambridgeshire: Assessment of Potential and Updated Project Design*. Albion Archaeology: Bedford.
- Barrett, J. C. (1980) The pottery of the Later Bronze Age in lowland England, *Proceedings of the Prehistoric Society* 46, pp. 297-319.
- Beck, C. and Jones, G. T. (1989) Bias and archaeological classification, *American Antiquity* 54(2), pp. 244-262.
- Bishop, R. R., Church, M. J. and Rowley-Conwy, P. A. (2009) Cereals, fruits and nuts in the Scottish Neolithic, *Proceedings of the Societies of Antiquaries of Scotland* 139, pp. 47-103.
- Blackbourn, K. (2017) *Middle to Late Bronze Age Funerary Activity and Late Bronze Age Occupation at Field End, Witchford: Post-Excavation Assessment and Updated Project Design*. Oxford Archaeology East: Oxford.
- Boyle, A. (1999) 'Human remains' pp. 171-183 in A. Barclay and C. Halpin (eds.) *Excavations at Barrow Hills, Radley, Oxfordshire, Volume 1: The Neolithic and Bronze Age Monument Complex Oxford*. Oxford Archaeological Unit: Oxford.
- Boyle, A. (2011) 'Overview', pp. 727-736 in J. Harding and F. Healy (eds.) *The Raunds Area Project: a Neolithic and Bronze Age Landscape in Northamptonshire, Supplementary Studies (Volume Two)*. English Heritage: Swindon.
- Branigan, K., Edwards, K. J. and Merrony, C. (2015) Bronze Age fuel: the oldest direct evidence for deep peat cutting and stack construction? *Antiquity* 76(293), pp. 849-855.
- Brown, S. and Daniel, P. (2019) Land off Derby Road, Doveridge, Derbyshire Post-excavation

Assessment and Updated Project Design. Wessex Archaeology: Salisbury.

Brück, J. (1995) A place for the dead: the role of human remains in Late Bronze Age Britain, *Proceedings of the Prehistoric Society* 61, pp. 245-277.

Brück, J. (1999) Houses, lifecycles and deposition on Middle Brone Age settlements in southern England, *Proceedings of the Prehistoric Society* 65, pp. 145-166.

Brück, J. (2001) 'Body metaphors and technologies of transformation in the English Middle and Late Bronze Age' pp. 149-160 in J. Brück (ed.) *Bronze Age Landscapes: Tradition and Transformation*. Oxbow: Oxford.

Brück, J. (2009) Women, death and social change in the British Bronze Age, *Norwegian Archaeological Review* 42(1), pp. 1-23.

Brück, J. (2015) 'Cremation, gender, and concepts of the self in the British Early Bronze Age', pp. 119-139 in G. Cooney (ed.) *Transformation by Fire: The Archaeology of Cremation in Cultural Context*. University of Arizona Press: Tucson, Arizona.

Brudenell, M. (2007) *Rhee Lakeside South: Archaeological Excavations at Colne Fen, Earith, 2006*. Cambridge Archaeological Unit: Cambridge.

Bunting, M. J., Tipping, R., and Downes, J. (2001) "Anthropogenic" pollen assemblages from a Bronze Age cemetery at Linga Fiold, West Mainland, Orkney, *Journal of Archaeological Science* 28, pp. 487-500.

Butterworth, C. A. and Lobb, S.J. (1992) *Excavations in the Burghfield Area, Berkshire: Developments in the Bronze Age and Saxon Landscapes*. Wessex Archaeology: Salisbury.

Campbell, G. (2007) 'Cremation deposits and the use of wood in the cremation ritual' pp. 30-32 in J. Harding and F. Healy (eds.) *The Raunds Area Project: A Neolithic and Bronze Age Landscape in Northamptonshire, Volume 1*. English Heritage: Swindon.

Campbell, G. (2011) 'Charred plant remains and charcoal', pp. 651-664 in J. Harding and F. Healy (eds.) *The Raunds Area Project: A Neolithic and Bronze Age Landscape in Northamptonshire, Volume 2: Supplementary Studies*. English Heritage: Swindon.

Carruthers, W. and Hunter Dowse, K. L. (2019) *A Review of Macroscopic Plant Remains from the Midland Counties*. Historic England: Swindon.

Caswell, E. and Roberts, B. W. (2018) Reassessing community cemeteries: cremation burials in Britain during the Middle Bronze Age (c. 1600-1150 cal BC), *Proceedings of the Prehistoric Society* 84, pp. 329-357.

Challinor, D. (2010) 'Charcoal', pp. 195-202 in K. Powell, A. Smith and G. Laws (eds.) *Evolution of a Farming Community in the Upper Thames Valley: Excavation of a Prehistoric, Roman and Post-Roman Landscape at Cotswold Community, Gloucestershire and Wiltshire*, volume 2. Oxford Archaeology: Oxford.

Christie, C. (2024) A14 Cambridge to Huntingdon, Cambridgeshire: West of Ouse Landscape Block Archaeology Report. Cambridgeshire County Council: Cambridge.

Çilingiroğlu, Ç (2005) The concept of "Neolithic package": considering its meaning and applicability, *Documenta Praehistorica* 32, pp. 1-13.

Clarke, C. P. and Lavender, N. J. (2008) *An Early Neolithic Ring-Ditch and Middle Bronze Age Cemetery: Excavation and Survey at Brightlingsea, Essex*. East Anglian Archaeology 126: Essex County Council.

Clarke, G. (2019) *Later Prehistoric and Roman Remains at Gunvil Hall Farm, Wymondham, Norfolk: Post-Excavation Assessment and Updated Project Design*. Oxford Archaeology: Oxford.

Clarke, G. (2020) *Later Prehistoric and Mid to Late Roman Remains at Gunvil Hall Farm, Wymondham, Norfolk: Archaeological Excavation Report*. Oxford Archaeology: Oxford.

Clarke, G. (2023) *Hanwood Park Plots R25 and E3*. Oxford Archaeology: Oxford.

Clarke, R. (2017) *Cranford Business Park, Kettering: Post-Excavation Assessment and Updated Project Design*. Oxford Archaeology: Oxford.

Cole, E. (2022) *Earsham Quarry, Norfolk: Area 1, Archaeological Excavation Report*, Oxford Archaeology: Oxford.

Collie, T. (2018) *Land at Maldon Road, Burnham West, Burnham-on-Crouch, Essex*. Oxford

Archaeology: Oxford.

Curtin, A. J. (2015) 'Putting together the pieces: reconstructing mortuary practices from commingled ossuary cremains', pp. 219-227 in C. W. Schmidt and S. A. Symes (eds.), *The Analysis of Burned Human Remains*. Academic Press: Cambridge, Massachusetts.

de Vareilles, A., Pelling, R. Woodbridge, J. and Fyfe, R. (2021) Archaeology and agriculture: plants, people and past land-use. *Trends in Ecology and Evolution* 36(10), pp. 943-954.

Dimbleby, G. (1978) *Plants and Archaeology*. Granada Publishing Limited: St Albans.

Earle, T. K. and Preucel, R. W. (1987) Processual archaeology and the radical critique, *Current Anthropology* 28(4), pp. 501-538.

Effenberger, H., Nickol, M. and Kirleis, W. (2021) *Arrhenatherum elatius* ssp. *bulbosum* revisited – a practical approach to decode past plant-related activities. *Environmental Archaeology* 26(1), pp.64-74.

Engelmark, R. (1984) Two useful plants from Iron Age graves in central Sweden in E. Baudou (ed.) *Papers in Northern Archaeology and Environment*, pp. 87-92.

Esposito, C., Lamb, L. A., Andersen, M. B., Millet, M., Inglis, E., Lugli, F., Nederbragt, A. J. and Madgwick, R. (2025) Diverse feasting networks at the end of the Bronze Age in Britain (c. 900-500 BCE) evidenced by multi-isotope analysis, *iScience* 28(9). Available at: <https://doi.org/10.1016/j.isci.2025.113271> (Accessed 10th of May 2026).

Evans, C. and Knight, M. (1998) The Butcher's Rise Ring-Ditches: Excavations at Barleycroft Farm, Cambridgeshire. Cambridge Archaeological Unit: Cambridge.

Evans, C. and Tabor, J. (2010) *The Over Narrows: Archaeological Investigations in Hanson's Needingworth Quarry, O'Connell Ridge East – The Site II Barrow*. Cambridge Archaeological Unit: Cambridge.

Fasham, P. J. (1982) The excavation of four ring-ditches in central Hampshire, *Proceedings of the Hampshire Field Club and Archaeological Society* 38, pp. 19-56.

Finn, N. (2011) *Bronze Age Ceremonial Enclosures and Cremation Cemetery at Eye Kettleby*,

Leicestershire: The Development of a Prehistoric Landscape. Leicester Archaeology Monograph 20. University of Leicester: Leicester.

Fowler, C. (2005) 'Identity politics: personhood, kinship, gender and power in Neolithic and Early Bronze Age Britain', pp. 109-129 in E. C. Casella and C. Fowler (eds.) *The Archaeology of Plural and Changing Identities: Beyond Identification*. Kluwer Academic/Plenum Publishers: New York.

Forum on Information Standards in Heritage (2026) Chronology. Available at: <https://heritage-standards.org.uk/chronology/> (Accessed: 6th of May 2026).

Franzén, D. (2001) The role of species richness for recruitment in a seminatural grassland, *Oikos* 95(3), pp. 409-415.

French, C. A. I. (1994) *Excavation of the Deeping St Nicholas Barrow Complex, South Lincolnshire*. Lincolnshire Archaeology and Heritage Report Series No. 1. Heritage Trust of Lincolnshire: Sleaford.

French, C. (2012) 'The palaeo-environments of Bronze Age Europe, pp. 34-56 in T. Earle and K. Kristiansen (eds.) *Organizing Bronze Age Societies: the Mediterranean, Central Europe, and Scandinavia Compared*. Cambridge University Press: Cambridge.

Gale, R. and Cutler, D. (2000) *Plants in Archaeology*. Westbury Academic and Scientific Publishing: London.

Godwin, H. (1956) *The history of the British flora: a factual basis for phytogeography*. Cambridge University Press: Cambridge.

Gonçalves, D., Campanacho, V. Thompson, T. and Mataloto, R. (2015) 'The weight of the matter: examining the potential of skeletal weight for the bioarchaeological analysis of cremation at the Iron Age necropolis of Tera (Portugal)', pp.49-170 in T. Thompson (ed.) *The Archaeology of Cremation: Burned Human Remains in Funerary Studies*. Oxbow: Oxford.

Hall, A. (2003) Recognition and characterisation of turves in archaeological occupation deposits by means of macrofossil plant remains, *Centre for Archaeology Report* 16/2003. English Heritage: Portsmouth.

- Hall, A. and Carrott, J. (2003) *Technical report: Plant remains from excavations at Hollow Banks, Scorton, near Catterick, North Yorkshire (site codes: HBS98-00 and W4338)*. Palaeoecology Research Services: Shildon.
- Hall, A. R. and Huntley, J. P. (2007) *A Review of the Evidence for Macrofossil Plant Remains from Archaeological Deposits in Northern England*. Historic England: Swindon.
- Harvard, T. (2017) *Cleevelands (Phase 1A and 2A), Bishop's Cleeve, Gloucestershire: Post-Excavation Assessment and Updated Project Design*. Cotswold Archaeology: Cirencester.
- Healy, F. and Harding, J. (2008) *The Raunds Area Project Volume 1: A Neolithic and Bronze Age Landscape in Northamptonshire*. English Heritage: Swindon.
- Healy, F. and Harding, J. (2011) *The Raunds Area Project Volume 2: A Neolithic and Bronze Age Landscape in Northamptonshire*. English Heritage: Swindon.
- Hewson, M. (2006) *Excavations at Whitemoor Haye Quarry, Staffordshire, 2000-2004: A Prehistoric and Romano-British Landscape*. BAR British Series 428. BAR Publishing: London.
- Hutton, J. (2008) *Excavations at Langtoft, Lincolnshire: The Freeman Land*. Cambridge Archaeological Unit: Cambridge.
- Hutton, J. (2011) 'An assessment of the shell remains', pp. 28 in *Further Excavations at Baston Quarry, Lincolnshire: Freeman Land – Archaeological Excavations 2009/2011*. Cambridge Archaeological Unit: Cambridge.
- Jelicic, A. (2020) The natural selection: reevaluating the significance of natural products in Viking Age cremation rituals. *Fennoscandia Archaeologica* 37, pp. 5-19.
- Jones, N. (2005) *Snail Down, Wiltshire: The Bronze Age Barrow Cemetery and Related Earthworks in the parishes of Collingbourne Ducis and Collingbourne Kingston Excavations, 1953, 1955, and 1957*. Wiltshire Archaeological and Natural History Society Monograph No. 3. English Heritage: Swindon.
- Kennedy, R. and Massey, R. (2019) An Early Bronze Age cremation cemetery at Beggarwood Lane, Basingstoke, Hampshire, *Proceedings of the Hampshire Archaeological Society* 74, pp. 9-

35.

Khameneh, A. J., Kordzadeh, A., Rastgoo, A. and Hadi, A. (2025) Investigation of the temperature effect on the properties of biological nanomembranes with different concentrations of cholesterol using molecular dynamics simulation, *Journal of Molecular Graphics and Modelling* 139. Available at: <https://doi.org/10.1016/j.jmgm.2025.109074> (Accessed 9th of May 2026).

Khan, A. U. (1991) Agro-ecology of onion couch (*Arrhenatherum elatius* var. *bulbosum*), *Annals of Applied Biology* 118(3), pp. 645-650.

Kurila, L. (2015) The accuracy of the osteological sexing of cremated human remains: a test based on grave goods from East Lithuanian barrows, *Collegium Anthropologicum* 4, pp. 821-828.

Lambrick, G. (1988) *The Rollright Stones: Megaliths, Monuments, and Settlement in the Prehistoric Landscape*. English Heritage: London.

Last, J., Smith, W., and van der Plicht, J. (2014) *The Excavation of Two Round Barrows on Longstone Edge, Derbyshire*. Historic England: Swindon.

Luke, M. (2016) *Close to the Loop: Landscape and Settlement Evolution Beside the Biddenham Loop, West of Bedford*. Albion Archaeology: Bedford.

Luke, M. and Barker, J. (2019) *Iron Age and Roman Settlement and a Bronze Age Ring-Ditch at Main Road, Earls Barton, Northamptonshire*. Albion Archaeology: Bedford.

Lyons, T. (2012) *Kirtling Green to Wixoe Pipeline: Post-Excavation Assessment and Updated Project Design*, volume 1. Oxford Archaeology East: Oxford.

Mabey, R. (1989) *Food for Free*. Collins Natural History: London.

Mace, T. (2019) A Bronze Age cremation cemetery at Jack Hill, Allithwaite, *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society* 19(3), pp. 1-22.

Macintosh, A. A., Pinhasi, R. and Stock, J. T. (2017) Prehistoric women's manual labor exceeded that of athletes through the first 5500 years of farming in Central Europe, *Science Advances* 29;3(11). Available at: <https://www.science.org/doi/10.1126/sciadv.aao3893> (Accessed 3rd of

May 2026).

Massey, R., Morris, E. L. and Good, O. (2018) Excavation of Four Barrows, and a Middle Bronze Age Cremation Cemetery at Heatherstone Grange, Bransgore, Hampshire. *Proceedings of the Hampshire Field Club and Archaeological Society* 73, pp. 11-89.

McKinley, J. I. (1997) Bronze Age 'barrows' and funerary rites and rituals of cremation.

Proceedings of the Prehistoric Society 63, pp. 129-145.

McKinley, J. I. (2004). Compiling a skeletal inventory: cremated human bone, pp.9-13 in M. Brickley and J. I. McKinley (eds.) *Guidelines to the Standards for Recording Human Remains*. Reading: Institute of Field Archaeologists.

McKinley, J. I. (2006) 'Cremation...the cheap option?', pp. 81-88 in R. Gowland and C. Knüsel (eds.) *The Social Archaeology of Funerary Remains*. Oxbow Books: Oxford.

McParland, L. C., Collinson, M. E., Scott, A. C., Campbell, G. and Veal, R. (2010) Is vitrification in charcoal a result of high temperature burning of wood? *Journal of Archaeological Science* 37, pp. 2679-2687.

Michalski, S. G., Malyshev, A. V. and Kreyling, J. (2017) Trait variation in response to varying winter temperatures, diversity patterns and signatures of selection along the latitudinal distribution of the widespread grassland plant *Arrhenatherum elatius*, *Ecology and Evolution* 7, pp. 3268-3280.

Moffett, L. C. (1989) The evidence for crop processing products from the Iron Age and Romano-British periods at Gravelly Guy and some earlier prehistoric plant remains. *Ancient Monuments Laboratory Report 46/89*: London.

Moffett, L. C., Robinson, M. and Straker, V. (1989) Cereals, fruit and nuts: charred plant remains from Neolithic sites in England and Wales and the Neolithic economy. *British Archaeological Report 496*. BAR Publishing (BAR): Oxford.

Moffett, L. C. (1991) Pignut tubers from a Bronze Age cremation at Barrow Hills, Oxfordshire, and the importance of vegetable tubers in the prehistoric period, *Journal of Archaeological Science*

18(2), pp. 187-191.

Monckton, A. (2011) 'Charred plant remains', pp. 79-81 in N. Finn (ed.) *Bronze Age Ceremonial Enclosures and Cremation Cemetery at Eye Kettleby, Leicestershire: the Development of a Prehistoric Landscape*. Leicester Archaeology Monograph 20. University of Leicester Archaeological Services: Leicester.

Morris, S. (2024) *Archaeological Mitigation at Magna Park, Lutterworth, Leicestershire: June 2020 to March 2021*. MOLA Northampton: Northampton.

Murphy, P. (1983) Rush Green, Clacton, Essex: plant macrofossils, *Ancient Monuments Laboratory Report* 3910: London.

Murphy, P. (1990) Moverons Farm, Brightlingsea, Essex: carbonised plant remains from a Bronze Age cremation cemetery. *Ancient Monuments Laboratory Report* 122/90: London.

Murphy, P. (1994) 'The plant macro-fossils' pp. 74-79 in C. A. I. French (ed.) *Excavation of the Deeping St. Nicholas Barrow Complex, South Lincolnshire*. Lincolnshire Archaeology and Heritage Report Series: Sleaford.

Murphy, K. and Mytum, H. (2011) Iron Age enclosed settlements in west Wales, *Proceedings of the Prehistoric Society* 78, pp. 263-313.

Nabi, S., Qaisar, K. N., Rather, S. A., Khan, P.A. and Nabi, B. (2017) Fuelwood characteristics of some important tree species in prevalent agroforestry systems of District Budgam, Kashmir Valley, India, *International Journal of Current Microbiology and Applied Sciences* 6(11), pp. 3801-3806.

O'Donnell, L. (2016) The power of the pyre – a holistic study of cremation focusing on charcoal remains. *Journal of Archaeological Science* 65, pp. 161-171.

Oxford Cotswold Archaeology (2026) *The A66 Northern Trans-Pennine Project*. Available at: <https://oxfordcotswoldarchaeology.org.uk/project/a66/> (Accessed: 1st of May 2026).

Palmer, S. C. (2009) Neolithic, Bronze Age, Iron Age, Romano-British and Anglo-Saxon sites excavated on the Transco Churchover to Newbold Pacey gas pipe line in 1999, *Transactions of*

the Birmingham and Warwickshire Archaeological Society 113. Birmingham and Warwickshire Archaeological Society: Birmingham.

Paradine, P. J. (1981) 'The plant remains' pp. 23 in P. Clay (ed.) *Two multi-phase barrow sites at Sproxton and Eaton, Leicestershire*. Leicestershire County Council: Leicester.

Parrington, M. (1978) The Excavation of an Iron Age Settlement, Bronze Age Ring-Ditches and Roman Features at Ashville Trading Estate, Abingdon (Oxfordshire) 1974-6. *Oxfordshire Archaeological Unit Report 1: CBA Research Report No. 28*. Oxfordshire Archaeological Unit: Oxford.

Pearson, M. P. (2005) *Bronze Age Britain*. English Heritage: Batsford Books: London.

Pennacchio, M., Jefferson, L. V. and Havens, K. (2010) *Uses and Abuses of Plant-Derived Smoke: its Ethnobotany as Hallucinogen, Perfume, Incense, and Medicine*. Oxford University Press: Oxford.

Pfitzenmeyer, C. D. C. (1962) *Arrhenatherum elatius* (L.) J. & C. Presl (A. Avenaceum Beauv.), *Journal of Ecology* 50(1), pp. 235-245.

Pickstone, A. and Mortimer, R. (2009) *The Archaeology of Brigg's Farm, Prior's Fen, Thorney, Peterborough*. Oxford Archaeology East: Oxford.

Rayner, L. (2015) *Around the Ancient Track: Archaeological Excavations for the Brighton and Hove Waste Water Treatment Works and Adjacent Housing at Peacehaven, East Sussex*. Spoilheap Publications: Woking, Surrey.

Robinson, M. (1988) 'The significance of the tubers of *Arrhenatherum elatius* (L.) Beauv. from Site 4, cremation 15/11', in G. Lambrick (ed.) *The Rollright Stones: Megaliths, Monuments and Settlements in the Prehistoric Landscape*. English Heritage: Swindon.

Robinson, M. (2000) 'Further considerations of Neolithic charred cereals, fruits and nuts' pp. 85-90 in A. S. Fairbairn (ed.) *Plants in Neolithic Britain and Beyond*. Oxbow: Oxford.

Roehrs, H., Klooss, S. and Kirleis, W. (2013) Evaluating prehistoric finds of *Arrhenatherum elatius* var. *bulbosum* in north-western and central Europe with an emphasis on the first

Neolithic finds in Northern Germany, *Archaeological and Anthropological Sciences* 5, pp. 1-15.

Romankiewicz, T. (2023) The building blocks of circular economies: rethinking prehistoric turf architecture through archaeological and architectural analysis, *Open Archaeology* 9(1).

Available at: <https://doi.org/10.1515/opar-2022-0331> (Accessed 10th of May 2026).

Roscher, C., Beßler, H., Oelmann, Y., Engels, C., Wilcke, W. and Schulze, E. (2009) Resources, recruitment limitation and invader species identity determine pattern of spontaneous invasion in experimental grasslands, *Journal of Ecology* 97(1), pp. 32-47.

Rottoli, M. and Castiglioni, E. (2011) Plant offerings from Roman cremations in northern Italy: a review, *Vegetation History and Archaeobotany* 20, pp. 495-506.

Samardžić, S., Arsenijević, J., Božić, D., Milenković, M., Tešević, V. and Maksimović, Z. (2017) Antioxidant, anti-inflammatory and gastroprotective activity of *Filipendula ulmaria* (L.) Maxim. and *Filipendula vulgaris* Moench, *Journal of Ethnopharmacology*, 213, pp. 132-137.

Schurr, M. R., Hayes, R. G. and Cook, D. C. (2015) 'Thermally induced changes' pp. 105-118 in C. W. Schmidt and S. A. Symes (eds.), *The Analysis of Burned Human Remains*. Academic Press: Cambridge, Massachusetts.

Serjeantson, D. (2007) 'Intensification of animal husbandry in the Late Bronze Age? The contribution of sheep and pigs' pp. 80-93 in C. Haselgrove and R. Pope (eds.) *The Earlier Iron Age in Britain and the Near Continent*. Oxbow: Oxford.

Smith, W. (2020) 'Charred plant remains', pp. 267-290 in S. Morris (ed.) *Archaeological Mitigation at Magna Park Lutterworth, Leicestershire June 2020 to March 2021*. Museum of London Archaeology: London.

Speed, G. (2010) *Mitchell Laithes Farm, Ossett, West Yorkshire*. Northern Archaeological Associates Ltd: Barnard Castle.

Stace, C. (2010) *New Flora of the British Isles*, third edition. Cambridge University Press: Cambridge.

Stevens, C. J. and Fuller, D. Q. (2012) Did neolithic farming fail? The case for a Bronze Age

- agricultural revolution in the British Isles, *Antiquity* 86(333), pp. 707-722.
- Sutton, B., Timpany, S., O'Donnell, L., Mighall, T. and Haston, S. (2025) The importance of burnt mound sites as an anthracological resource for understanding prehistoric woodland exploitation, *Environmental Archaeology: The Journal of Human Palaeoecology*, pp. 1-20.
- Taylor, M. (1984) 'Charcoal', pp. 126-127 in D. Priddy (ed.) *Work of Essex County Council Archaeology Section 1982, The Transactions of the Essex Archaeological Society* 15.
- Teague, S. and Champness, C. (2019) Excavation of a Bronze Age Cremation Cemetery and a Romano-British Enclosure at Glebelands, Broughton, Milton Keynes. Oxford Archaeology: Oxford.
- Teather, A. and Chamberlain, A. (2016) Dying embers: fire-lighting technology and mortuary practice in Early Bronze Age Britain, *The Archaeological Journal* 173, pp. 188-205.
- Thomas, J. (1991) *Rethinking the Neolithic*. Cambridge University Press: Cambridge.
- Thomas, J. (2008) *Monument, Memory and Myth: Use and re-use of three Bronze Age Round Barrows at Cossington, Leicestershire*. Leicester Archaeology Monograph 14. University of Leicester: Leicester.
- Ubelaker, D. H. (2015) 'Case applications of recent research on thermal effects on the skeleton', pp. 151-170 in T. Thompson (ed.) *The Archaeology of Cremation: Burned Human Remains in Funerary Studies*. Oxbow: Oxford.
- Ui Choileàin, Z. (2012) 'Human skeletal remains', pp. 152-163 in T. Lyons (ed.) *Kirtling Green to Wixoe Pipeline: Post-Excavation Assessment and Updated Project Design*, volume 1. Oxford Archaeology East: Oxford.
- Vera, F. (2018) 'The wood pasture: for food, wood and biodiversity' pp. 184-213 in A. H. Colak, S. Kirca and I. D. Rotherham (eds.) *Ancient Woodlands and Trees: A Guide for Landscape Planners and Forest Managers*. International Union of Forest Research Organizations (IUFRO) and Turkish Academy of Sciences (TUBA): Cankaya/Ankara and Vienna.
- Wallis, N. J., Rick, T. C., Oliveira, C. I. R., Luthra, A., Green, J., Jayarajan, A. and LeFebvre, M. J.

(2025) The effect of survivorship bias on archaeological oyster valve size metrics: implications for fisheries baselines, *Journal of Archaeological Science* 181. Available at:

<https://doi.org/10.1016/j.jas.2025.106335> (Accessed 10th of May 2026)

Wessex Archaeology (2012) *Defence Training Estate: Salisbury Plain Delta Track West, Post-Excavation Assessment Report*. Wessex Archaeology: Salisbury.

Wilkin, N. C. A. (2013) *Food Vessel pottery from Early Bronze Age funerary contexts in northern England: a typological and contextual study*. Unpublished thesis: University of Birmingham.

Wymer, J. and Brown, N. (1995) North Shoebury: Settlement and Economy in South-East Essex 1500BC-AD1500, *East Anglian Archaeology* 75: Essex County Council Archaeology Section: Chelmsford.

Figures

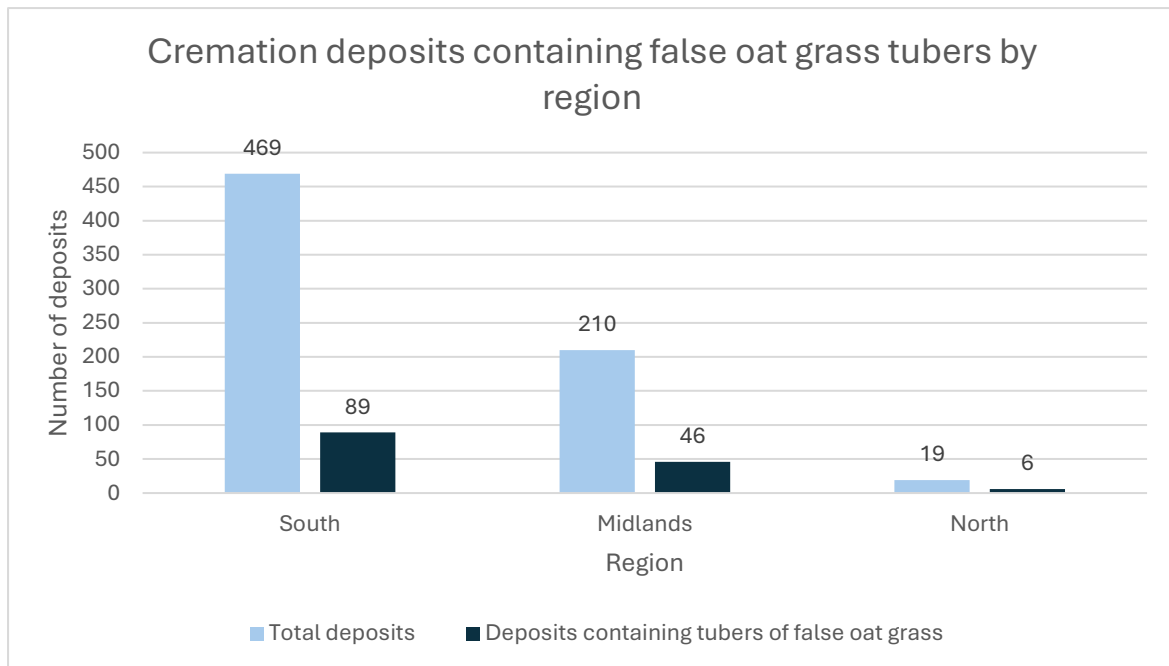


Figure One. Total number of cremation deposits and the number of them containing tubers of false oat grass by region.

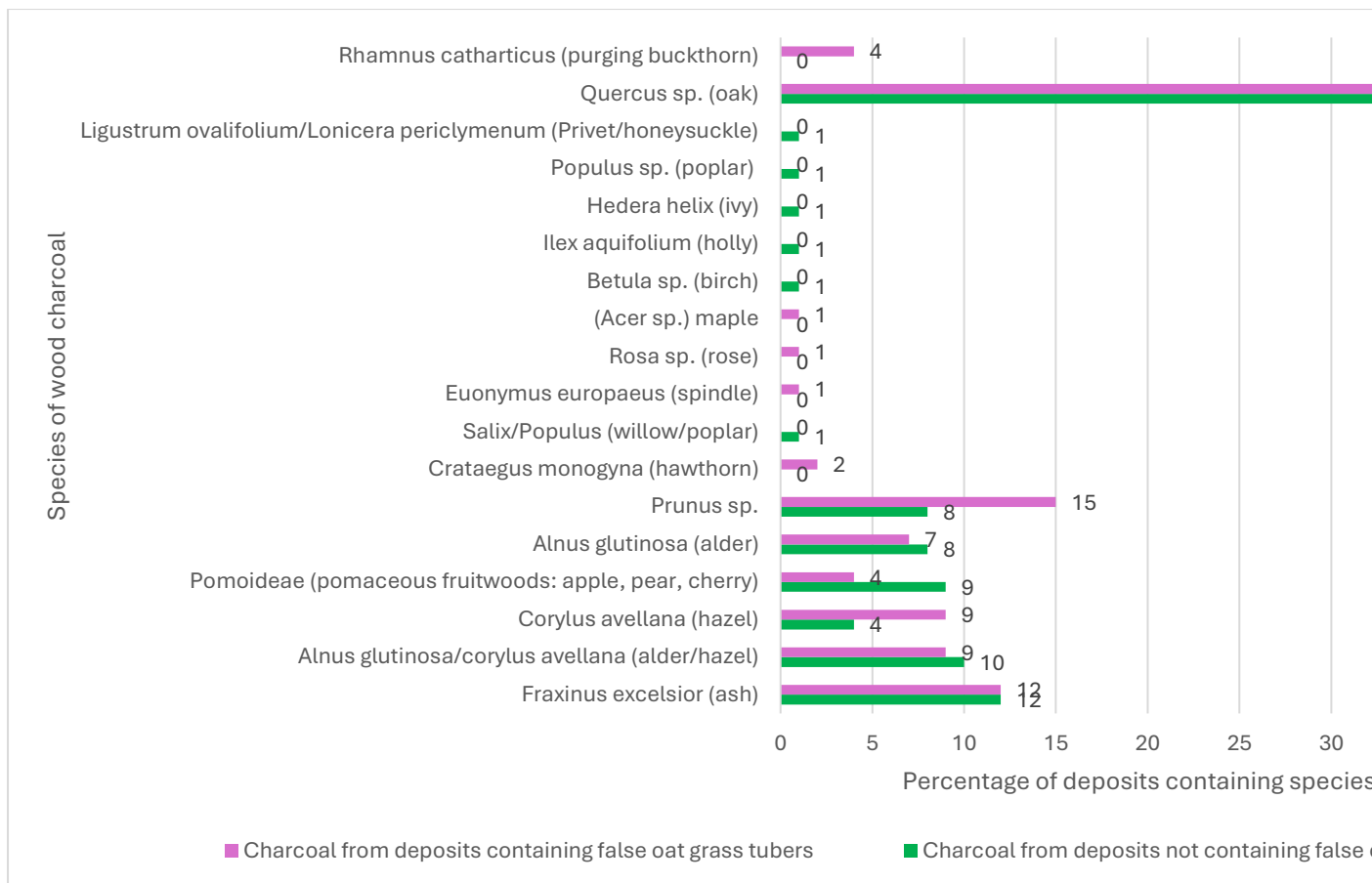


Figure Two. Deposits containing charcoal fragments of an identified species.

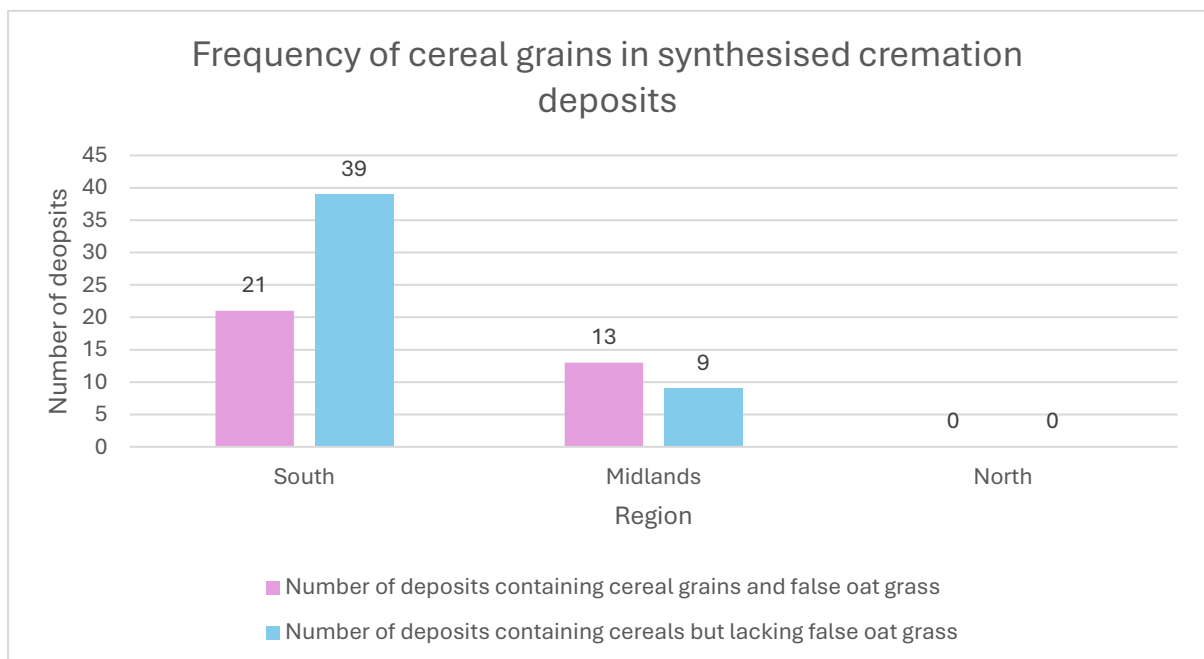


Figure Three. Cremation deposits containing cereal grains by region and presence of false oat

grass tubers by region.

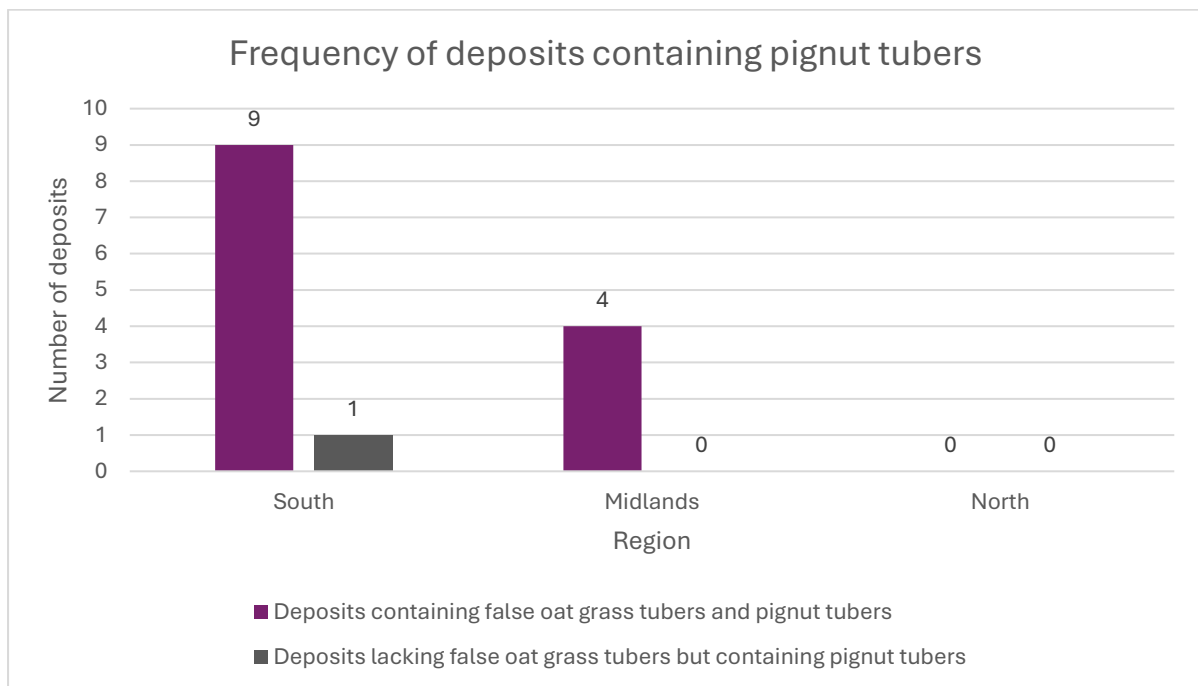


Figure Four. Cremation deposits containing pignut tubers and presence of false oat grass tubers by region.

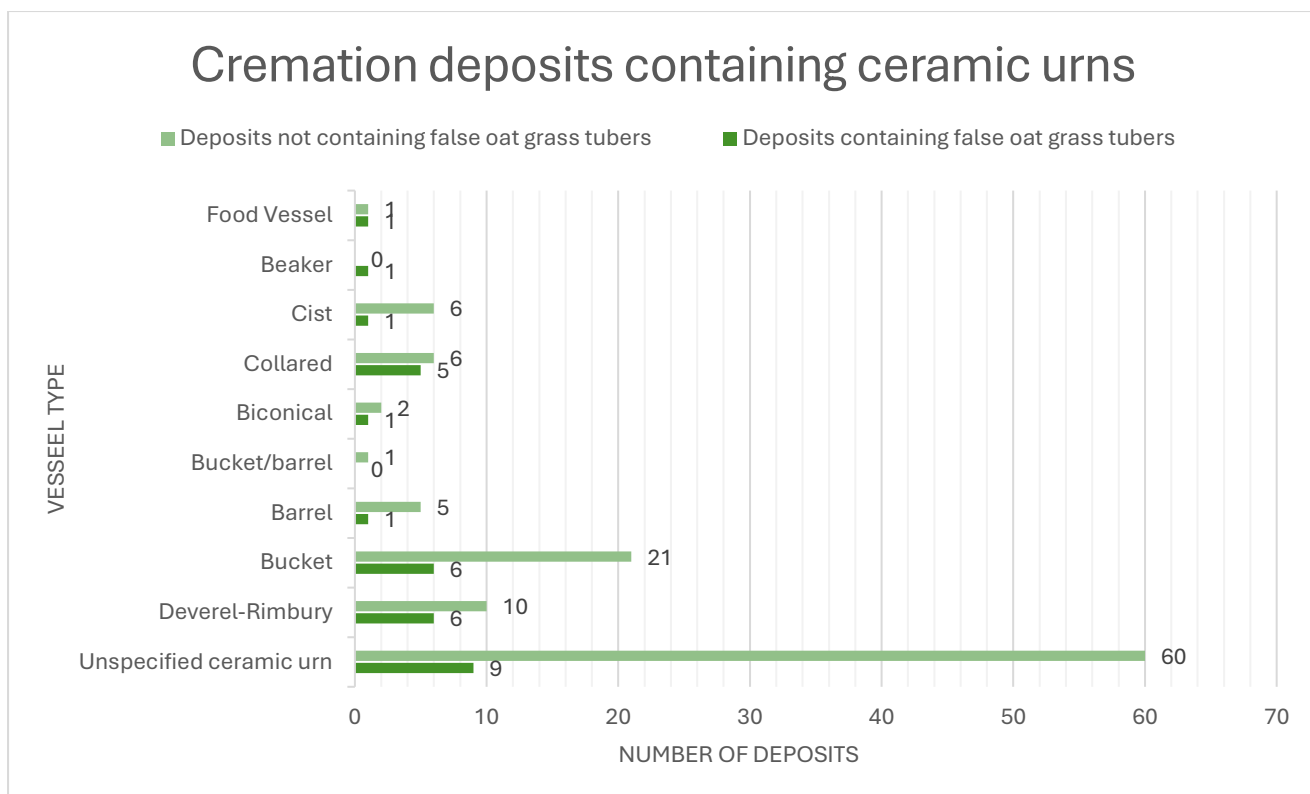


Figure Five. Ceramic vessel forms in deposits containing and not containing false oat grass tubers.

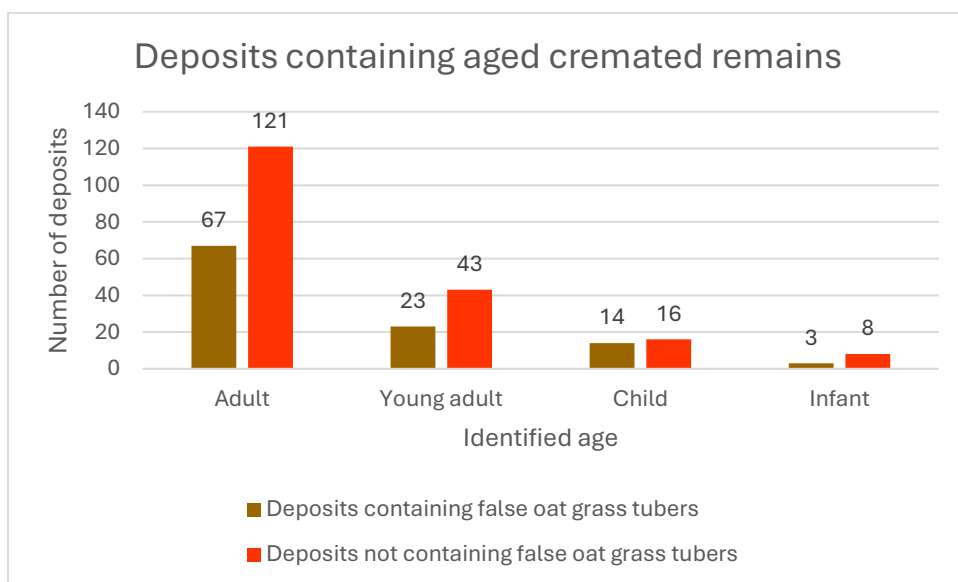


Figure Six. Deposits containing aged cremated remains.

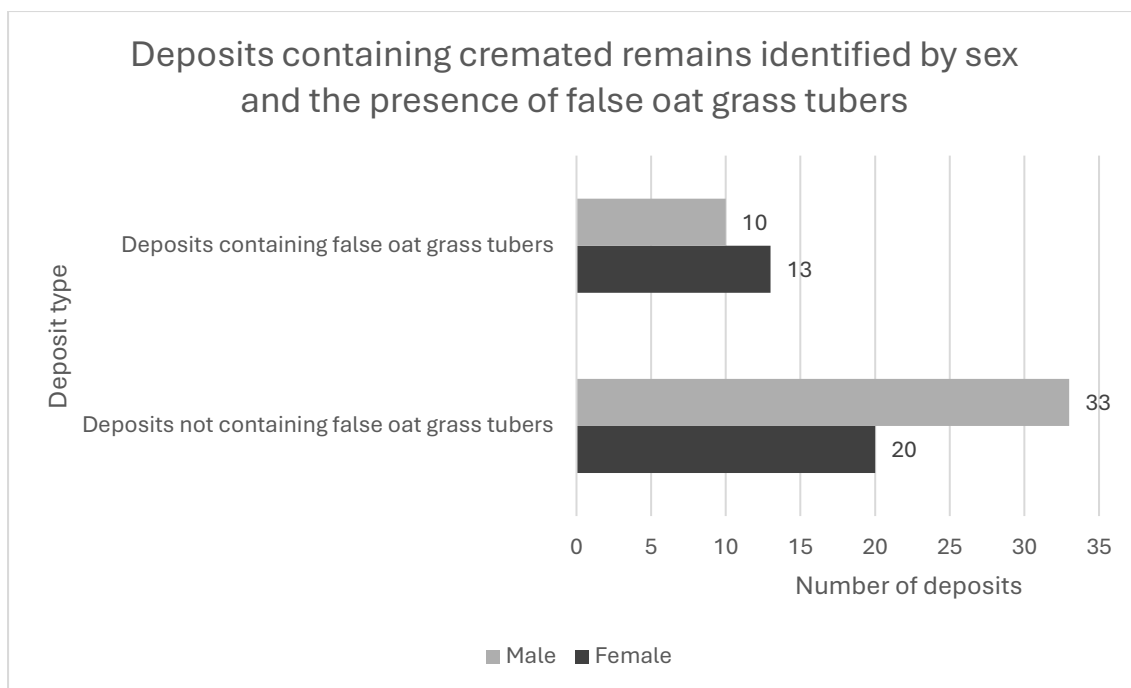


Figure Seven. Deposits with identifiable sex and amounts of false oat grass tubers.

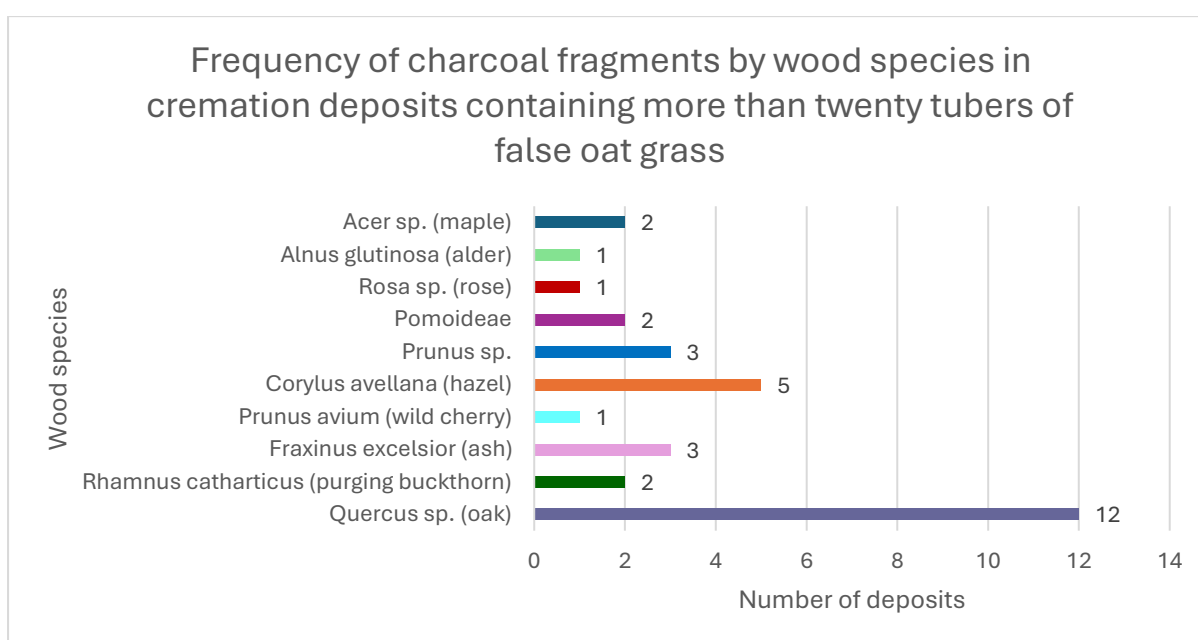


Figure Eight. Wood charcoal fragments from cremation deposits containing large amounts (more than twenty) tubers of false oat grass.

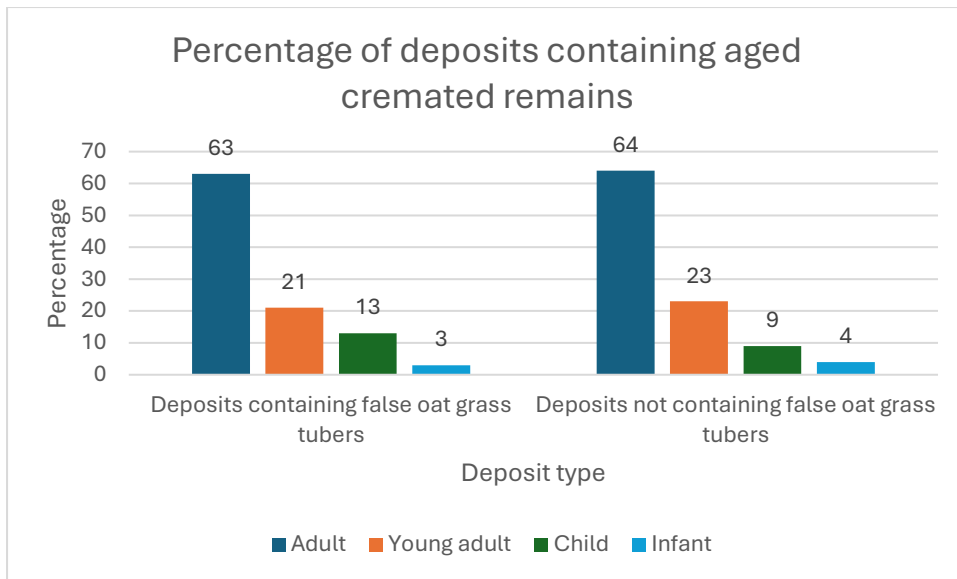


Figure Nine. The percentage of aged cremated remains in cremation deposits containing and not containing false oat grass tubers.

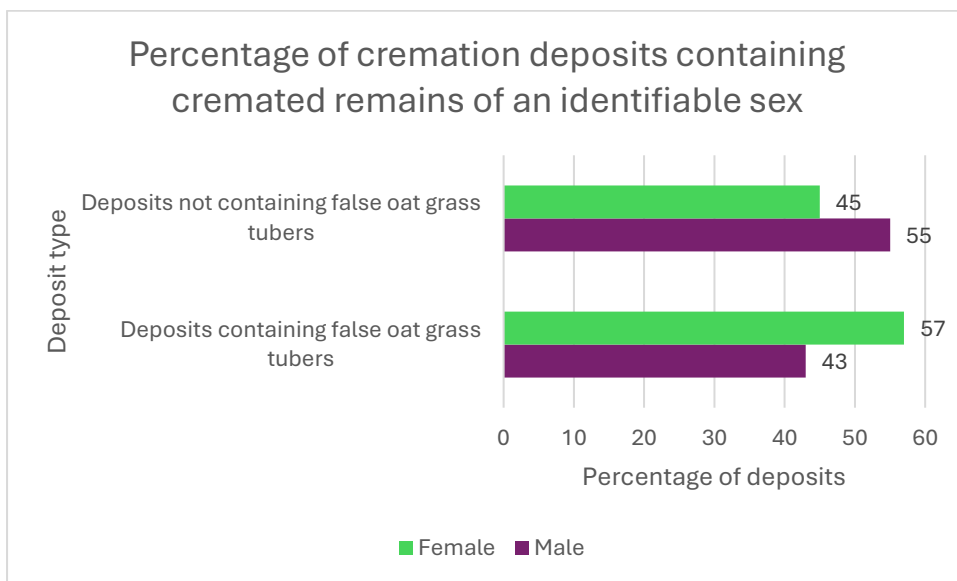


Figure Ten. The percentage of cremated deposits containing cremated remains of an identifiable sex in deposits containing and lacking tubers of false oat grass.

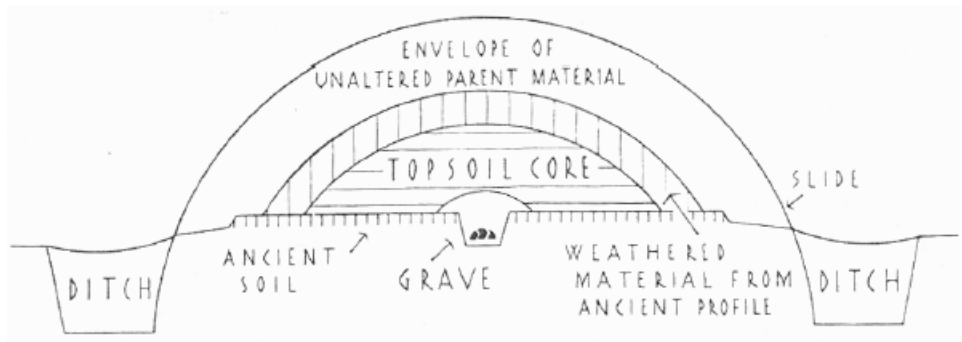


Figure Eleven. A diagram showing the construction of a turf mound, from Ashbee (1960, p. 42).

Before cremation	The cremation takes place	After cremation
Gathering of materials for the cremation pyre structure		Further fragmentation of the remains through manual means
Construction of the cremation pyre		Raking or sorting of the cremated remains
Gathering of fuel for the cremation pyre		Placing the remains within an organic or ceramic container
Placing and lighting fuel under the cremation pyre		Adding ritual food offerings
Preparing the deceased (excarnation, dismemberment, etcetera)		Funerary/feasting
Transporting the deceased to the cremation pyre		Adding grave goods
Placing the deceased on the cremation pyre		Commingling of remains with other individuals
Adding pyre goods		Burial of cremated remains
Adding ritual food offerings		Revisiting of the area of internment by friends and relatives

Figure Twelve. The actions and choices associated with the cremation ritual both before and

after the burning of the body of the deceased (the cremation) that may produce evidence in the archaeological record.