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Evergreen Plants in Roman Britain and Beyond: Movement, Meaning and Materiality

By LISA A. LODWICK

ABSTRACT

In tandem with the large-scale translocation of food plants in the Roman world, ornamental evergreen plants and plant items were also introduced to new areas for ritual and ornamental purposes. The extent to which these new plants, primarily box and stone-pine, were grown in Britain has yet to be established. This paper presents a synthesis of archaeobotanical records of box, stone-pine and norway spruce in Roman Britain, highlighting chronological and spatial patterns. Archaeobotanical evidence is used alongside material culture to evaluate the movement of these plants and plant items into Roman Britain, their meaning and materiality in the context of human-plant relations in ornamental gardens and ritual activities. Archaeobotanical evidence for ornamental evergreen plants elsewhere in the Roman world is presented.

Keywords: box; stone-pine; Roman Britain; Roman gardens; ritual activity; plant materiality; archaeobotany

INTRODUCTION

The introduction of a wide range of new plants in the Roman period marked a major change in the Holocene flora of Britain. While the presence of a diverse range of horticultural crops, including fruits, nuts, pulses, vegetables and flavourings, has received much attention, another category of plants, ornamental evergreen shrubs and trees, was also introduced.[1] Archaeobotanical evidence for the presence of box (*Buxus sempervirens* L.) and stone-pine (*Pinus pinea* L.) (FIG. 1) in Roman Britain has been known of for over 100 years.[2] However, the wealth of new archaeobotanical data produced following the upsurge in developer-funded archaeology has yet to be used to develop a more nuanced understanding of

[1] Godwin 1975; Van der Veen *et al.* 2008.
[2] Lodwick 2016. Brief accounts of the archaeobotanical distribution of box and stone-pine are presented in Dickson 1994 and Van der Veen *et al.* 2008.

the chronological and social patterns of these new plants.[3] Independent of these developments, several scholars have approached the translocation of plants in the Mediterranean, such as plane, citruses and cherry, through the lenses of élite behaviour, cultural change and environmental concerns, with particular focus on plants in private and public gardens, albeit largely drawing on a range of written evidence.[4] Globalisation, the intensification of connectivity, has previously been used to study the movement of food plants, but the translocation of ornamental plants also reflects the spread of material culture throughout the Roman world.[5] The limited exploration of the archaeobotanical evidence for introduced plants in Roman gardens is countered here by a focus on the province of Britannia which has an exceptional record of plant remains. The presence of introduced ornamental evergreen plants in Roman Britain has significance both for understanding the ecological impacts of Rome on its empire and for exploring the changing relationships between humans and plants.[6] Recent studies in the fields of anthropology, human geography and philosophy have highlighted the ways in which plants can affect or 'act on' humans, following in the wake of 'the material turn' and 'the animal turn'.[7] This broad and vibrant field of human-plant studies is beginning to impact upon the field of archaeology, with the focus thus far placed on how plants can act upon humans in relation to the activities of farming and ritual, with no consideration yet given to ornamental plants.[8]

FIG. 1. Box (*Buxus sempervirens*) and stone-pine (*Pinus pinea*) trees growing at Kew Gardens, London, UK.

[3] Van der Veen *et al*. 2007; Fulford and Holbrook 2011.
[4] Boivin *et al*. 2012; Versluys 2014.
[5] Marzano 2014; Hughes 2003; Macaulay-Lewis 2008; Pollard 2009; Totelin 2012.
[6] Hall 2011; Nealon 2016; Head *et al*. 2014.
[7] Hicks 2010; Sykes 2014.
[8] Van der Veen 2014; Livarda 2013; Lodwick 2015.

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A reassessment of ornamental plants is crucial for understanding human-plant relationships in the past, but also in the present. Box is currently classed as a native plant in Britain, although its native status continues to be questioned in north-west Europe.[9] However, box is rare and is currently suffering from box blight and the box tree moth.[10] The status of box as a native or alien plant contributes to the extent of conservation and protection the plant receives today. This paper draws on the rich archaeobotanical dataset from the province of Britannia to identify the chronological, spatial and social distribution of box, stone-pine and norway spruce in Roman Britain, before assessing evidence for the movement of these plants to Britain and material culture and literary evidence for their meaning. The idea of plant materiality, that is recognising the agency of plants in human-plant relationships, is advanced through a consideration of the visual appearance, smell, physicality and temporality of introduced evergreen plants and plant items.

EVERGREEN PLANTS IN THE ARCHAEOLOGICAL RECORD

PRESERVATION

The recovery of evidence for the presence of ornamental plants at archaeological sites has long been recognised as a challenging field. In certain areas, such as Campania and Tunisia, the techniques of 'garden archaeology' have been utilised, most prolifically by Jashemski, to recognise planting holes, water systems and garden layouts.[11] In Britain, garden layouts have been recorded at a few sites, such as Bancroft, Fishbourne and Frocester villas, yet evidence for planting holes is rarely found and, instead, archaeobotanical evidence must be relied upon to provide information about garden composition.[12] The remains of evergreen plants are found through two modes of preservation in Britain. Charring, the partial combustion of plant remains in a reducing atmosphere, is unlikely to produce evidence for ornamental plants as these do not usually come into contact with fire. However, there are high numbers of charred stone-pine cones and nuts due to their occurrence in ritualised deposits. Waterlogging, the preservation of plant remains in permanently waterlogged anoxic sediments, either below the water table in pits or wells, or waterlogged in highly organic surface deposits, often preserves delicate plant remains, such as box leaves. However, waterlogged assemblages often contain plant remains of mixed origin, hindering their interpretation.[13] In addition, the distribution of sites with waterlogged sediments is biased towards gravel terraces and urban settlements. Box leaves recovered from inhumation burials are likely to have derived from a type of metal oxide mineralisation, yet these sites are all antiquarian finds and the precise form of preservation cannot be established.

The systematic recovery of plant remains from archaeological sites relies upon bulk sampling, not introduced on a wide scale until the late 1970s.[14] However, due to their relatively large size, box leaves and stone-pine cones were both collected by hand throughout the earlier twentieth century. While this produced a record of these plants, any smaller plant remains would not have been recovered, hence their relative distribution within a site and through time cannot be examined. A further recovery bias affecting where these plants have been recorded is the concentration of post Planning Policy Guidance 16 archaeobotanical work in the south-east of

[9] Decocq *et al*. 2004; Di Domenico *et al*. 2012; Pigott and Walters 1953; Coates 1999.
[10] Hill *et al*. 2004; Henricot and Culham 2002; Mally and Nuss 2010.
[11] Jashemski 1981; Jashemski *et al*. 1995; Gleason 2010; Farrar 2011.
[12] Cunliffe 1981; Zeepvat 1991.
[13] Murphy and Scaife 1991.
[14] Lodwick 2016.

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Britain, as well as at major modern settlements and route ways.[15] Archaeobotanical data can provide much more precise evidence for the types of plants growing than garden archaeology, yet these biases of preservation and recovery must be kept in mind when interpreting patterns in the data.

PREVIOUS WORK ON IMPORTED EVERGREEN PLANTS

Antiquarian excavations from the mid-nineteenth century onwards produced evidence for the presence of introduced evergreen plants in Roman Britain. The plant remains were sent to botanists for identification, for example box leaves from an inhumation burial at Chesterford, Essex were identified by Professor Henslow at the University of Cambridge. Likewise, box leaves from an inhumation at Cann were identified by the geologist and palaeobotanist Clement Reid. Even in this early work, the archaeobotanical evidence was related to the status of box as an introduced plant. To quote from Reid: 'The box has been considered a doubtful native of Britain, but now we have it at two localities associated with Roman remains.'[16] Similarly, an object described as a 'fir cone' was recovered from waterlogged sediments at the New Royal Exchange site, London in the 1840s,[17] which in hindsight seems likely to have been a stone-pine cone. No significance was attached to the find and it was not until the mid-twentieth century, following the recovery of charred stone-pine remains from several religious sites, that their role in ritual activities was recognised.[18]

The importance of these records from a botanical perspective was highlighted by Godwin in his seminal review of the flora of the British Isles.[19] In his synthesis of Roman agriculture, Applebaum did not include stone-pine, but instead listed deciduous trees as introductions to Roman Britain such as the 'Spanish chestnut, horse chestnut, sycamore, walnut, holm-oak and possibly the Spanish laurel',[20] all of which are now considered as doubtful introductions. Box was considered to be 'not a Roman introduction, but may have been encouraged for this [funerary] and other uses'.[21] By the late 1970s, it had been firmly established that a range of exotic plants was introduced to Roman Britain.[22] The proliferation of rescue excavation produced further archaeobotanical finds of imported evergreen plants, many of which have remained unpublished in grey literature. Key examples are from villas at Stanwick, Northants., and Rectory Farm, Godmanchester.[23] Nevertheless the growing archaeobotanical evidence was incorporated within several key syntheses of Roman gardens in Britain. Cunliffe considered the introduction of new flora, including stone-pine and box, as a product of 'intensive Romanisation',[24] and concentrated instead on the architectural evidence for Roman gardens. A decade later, Zeepvat again focused on the evidence for garden layout at the villas at Fishbourne, Frocester and Bancroft, briefly noting that 'the ubiquitous box was used as a hedging plant throughout the western Empire'.[25] While two key syntheses have briefly summarised the evidence for introduced evergreens alongside the main subject matter of food plants in Roman Britain,[26] the

[15] Fulford and Holbrook 2011; Van der Veen *et al.* 2007.
[16] Gray 1918, 71.
[17] Tite 1848.
[18] Wheeler and Wheeler 1936; Blackburn 1951; Grimes 1968, 114.
[19] Godwin 1975.
[20] Applebaum 1958, 71.
[21] ibid.
[22] Willcox 1977.
[23] Murphy 2001; Crosby and Muldowney 2011; Campbell 1995.
[24] Cunliffe 1981, 97.
[25] Zeepvat 1991, 59.
[26] Dickson 1994; Van der Veen *et al*. 2008.

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prevailing field of garden archaeology has subsumed the study of introduced plants within the locales of the villa and peristyle garden.[27]

DATA COLLECTION AND INTERPRETATION

In order to produce a new understanding of the introduction and use of evergreen plants in Roman Britain, archaeobotanical reports have been reviewed from all Roman rural settlement sites, utilising the published and grey literature synthesised in the Roman Rural Settlement Project database,[28] and published data from urban and military sites. The presence of box leaves, stone-pine cones and nutshells, as well as other introduced evergreen plants has been recorded on a 'record basis', i.e. presence per major site phase.[29] Site classification follows that of the Roman Rural Settlement Project and period classification is as follows: activity from *c.* A.D. 43–end first century and into the second century (Early Roman); second and third centuries (Middle Roman); fourth century (Late Roman).

The focus in this paper is on plant remains which may have derived from trees and shrubs growing in Roman Britain. Artefactual evidence for objects made from boxwood and *Abies alba* L. (silver fir), such as combs and writing-tablets,[30] is not included, as their portability is considered to limit their ability to provide useful evidence for the presence of introduced evergreen plants. Macrofossils (seeds, leaves, cones), rather than pollen evidence, are the focus of this study as they are considered to provide more direct evidence for the presence of evergreen plants or plant items. Charcoal records have also been retrieved from the archaeobotanical computer database and by consulting specialists.[31] A list of archaeobotanical data and references is provided in Appendix Tables 1 and 2, while pollen studies are referred to where available.

In order to establish whether plant remains represent *in-situ* plants or portable plant-derived items, attention has been paid to the context and condition of plant remains. Where possible, taphonomic evidence for the plant remains themselves (charring and fragmentation)[32] and the context in which the plant remains were recorded have been noted.[33] The interpretation of the records draws on two areas of study. First, literary, artistic and archaeobotanical evidence from the Roman world has been used to evaluate to what extent the meaning of evergreen plants in Roman Britain can be established. Second, ethnographic studies are drawn upon within cultural geography which have highlighted how plants affect people through characteristics such as colour, structure and ecological temporality[34] — considerations which closely correspond with multi-sensory approaches within classical archaeology.[35]

EVERGREEN PLANTS IN ROMAN BRITAIN: RESULTS

BOX – *Buxus sempervirens*

Box is an evergreen shrub or small tree, certainly native to southern Europe, northern Africa and western Asia.[36] In Britain today, it is found in woods and scrub on calcareous limestone

[27] MacDougall and Jashemski 1981.
[28] Allen *et al.* 2015.
[29] Following Van der Veen *et al.* 2008.
[30] Pugsley 2003.
[31] Tomlinson and Hall 1996.
[32] Lodwick 2015.
[33] Murphy and Scaife 1991.
[34] Head and Atchison 2009; Head *et al.* 2014; Hitchings 2003; Brice 2014; Pitt 2015.
[35] Betts 2011; Macaulay-Lewis 2011; Draycott 2015.
[36] Decocq *et al.* 2004.

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escarpments, restricted to west Kent, Surrey, Berkshire, Buckinghamshire and west Gloucestershire.[37] Various ancient authors, including Pliny the Younger, describe the use of box in Roman villa gardens, particularly for topiary.[38] Box is also depicted in several fresco scenes, including at Livia's villa at Prima Porta, Rome.[39] By contrast, evidence for the use of box in Roman Britain is almost entirely based on archaeobotanical evidence. Macrofossil plant remains of box have been recovered from 31 sites in Roman Britain, 24 of which are waterlogged occurrences. Exceptions are a charred leaflet from Stonea, Cambs.,[40] charcoal from Frocester Villa, Glos., and Westhawk Farm, Kent,[41] and the likely metal oxide mineralised box leaves recovered from four burials at Bartlow Hills, Cann, Chesterford and Roden Down. The distribution of box by site type (FIG. 2) shows that evidence for box has most commonly been recovered from major towns (14 records), followed by burials and villas (5 records each), four farmsteads and two religious sites (Bath and Marcham). However, it is also worth noting that the major towns are only London, Silchester and York, all sites which contain many archaeological deposits with waterlogged preservation and a long history of archaeobotanical investigation.[42]

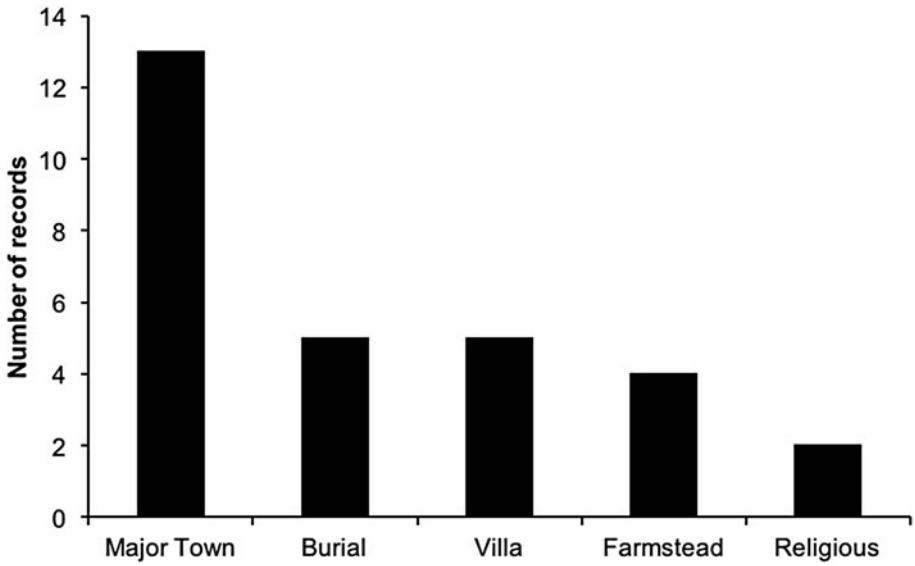

FIG. 2. Distribution of waterlogged macrofossil finds of box by site type.

The burials are located in Dorset, Berkshire, Cambridgeshire and Norfolk and stretch from the Early to the Late Roman period. At the Bartlow Hills cemetery, box leaves and branches were found adhering to the base of a cremation urn and date to the late first/early second century.[43] Two of these burials are child inhumations. At Scole, Norfolk, a sample from the chest area of an early to mid-second-century inhumation contained box leaves and many fruits of deadly

37 Stace 2010, 122.
38 Pliny the Younger, *Epistularum* 5.6.
39 Caneva and Bohuny 2003.
40 Van der Veen 1996.
41 Price 2000, 258; Challinor 2008.
42 Robinson 2015.
43 Gage 1839; Eckardt *et al*. 2009.

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nightshade (*Atropa belladonna* L.).[44] These were considered to have been intentionally placed as a wreath, but no data were presented in the publication against which to evaluate this claim. An undated burial of a child in a lead coffin at Cann, Dorset, contained a large number of box leaves and short sprigs around the head. Again, these were interpreted as a wreath, but no detailed record was made.[45] A further example of a lead-lined coffin burial was that of an elderly (50+) woman from Roden Down, Berks., where box leaves and young stems were recorded as lining the base of a coffin and around the head and legs. The burial was dated to after A.D. 364.[46]

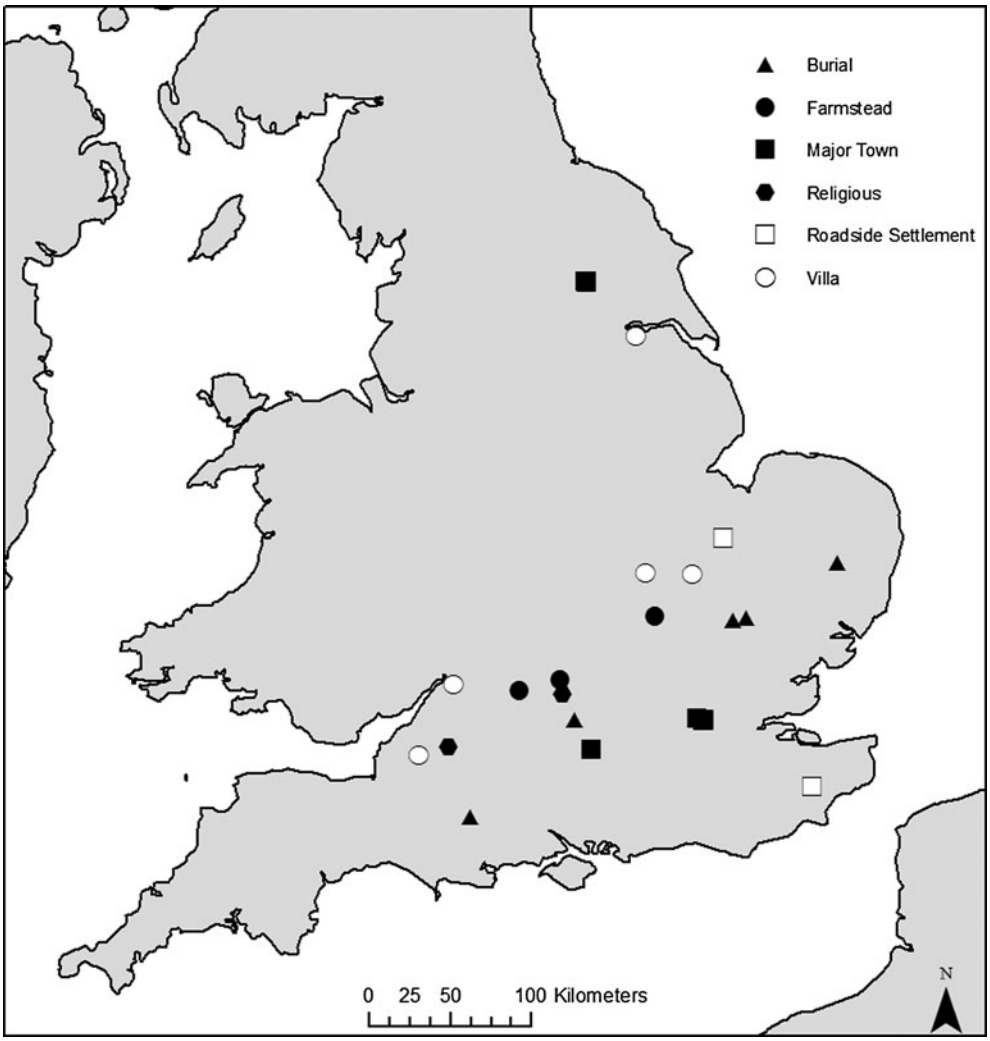

FIG. 3. Spatial distribution of macrofossil finds of box.

[44] Fryer and Murphy 2014.
[45] Gray 1918.
[46] Allison 1947; Hood and Walton 1948.

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The spatial distribution of box is largely focused in central-southern Roman Britain, a pattern heavily affected by the distribution of sites with waterlogged preservation in the major river valleys of the Thames, Nene and Ouse (FIG. 3). The rural farmsteads and roadside settlements where box has been recovered are located in the Upper Thames valley, the Ouse valley, Somerset and Suffolk, while the villas where box has been identified stretch from Godmanchester in Cambridgeshire to Winterton in Lincolnshire. The chronological distribution of box (FIG. 4) shows that the presence of box leaves within settlements was largely confined to the second century onwards. The only Early Roman records are those of the box leaves at the Bartlow Hills cremation burial and at the Drapers' Garden site in London. Here, several intact box leaves were recovered from a ditch dating to the later first century.[47] At the New Royal Baths site in the south-west of Bath, box twigs were recovered from a ditch which was backfilled with late first- and early second-century ceramics.[48]

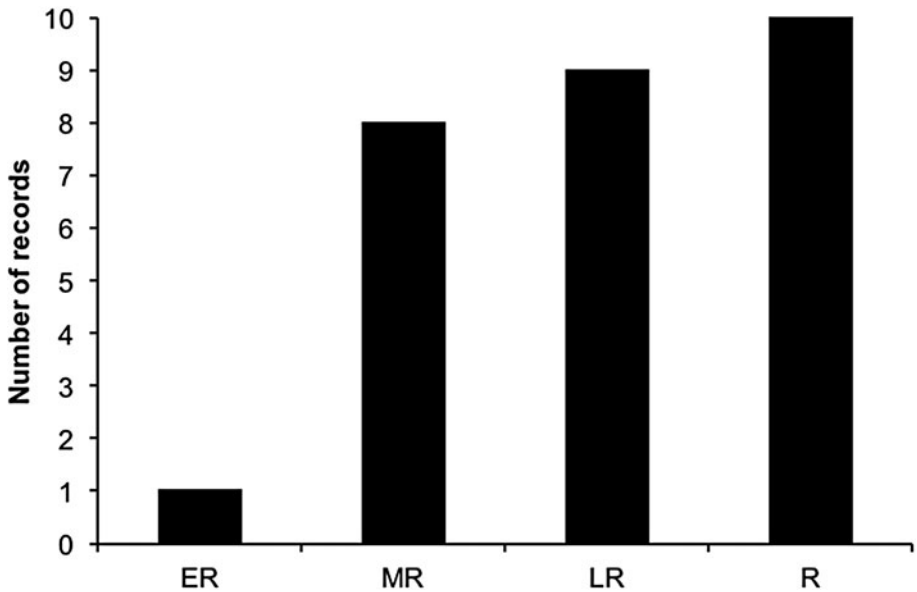

FIG. 4. Chronological distribution of macrofossil finds of box.

Of the eight Middle Roman records, virtually all derive from the major towns of London, Silchester and York, as well as the religious centre at Bath. Box leaves have not been recovered from any other major towns. This pattern is largely due to preservation and sampling, as very few or no waterlogged samples have been analysed from other major towns such as Cirencester, Lincoln, Leicester or Colchester. Evidence for Middle Roman box has also been recovered from the eastern area of Roman Britain, from a child's burial at Scole and a charred box leaflet from the roadside settlement at Stonea. While there is no marked rise in the number of records in the Late Roman period (nine), box leaves have been found at a wider range of sites, including the villas at Frocester, Godmanchester and Stanwick, as well as rural farmsteads

[47] Drapers' Garden: unpublished environmental report: Batchelor *et al*. 2011; preliminary publication: Butler and Ridgeway 2009.
[48] Davenport *et al*. 2007, 33.

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at Marsh Leys, Kempston and Farmoor. The examples dated only to the Roman period derive from antiquarian investigations of burials, villas and towns, as well as unpublished grey literature. The chronological pattern presented here is based on the number of sites per period, with the potential that the total number of sites investigated per period could differ. However, the same pattern was identified by the national review of Van der Veen *et al*., with an increase in the frequency of box within all waterlogged records from 1 per cent in the Early Roman period to 13 per cent in the Late Roman period.[49]

Establishing a more precise understanding of the use of box at these settlements is difficult. Many box leaves do not have precise sampling information, either because they were hand-collected during excavation, as at 15–35 Copthall Avenue, London, or because no sampling information was included at publication. An inherent limitation of studying waterlogged plant remains is that waterlogged assemblages usually contain material from a diverse range of sources, making it difficult to identify the source of one component of a sample. Box leaves included in this category are the leaves from the waterfront infill deposits at 12 Arthur Street, London, and leaves from various levelling and accumulation deposits at General Accident Site/ Tanner Row in York. It is conceivable that these box leaves may have derived from dumped rubbish originating from either the distant or immediate area. In some cases, a local source can be suggested based on the consistent presence of box leaves in an area, as with six out of seven of the well fills at Skeldergate, York. Exemplary sites where the spatial association of box remains can be established are at 1 Poultry, in the western suburb of Roman London. Here box leaves and stems, and cf. Pinaceae (conifer) leaves, were found interleaved in silting over a later third-century gravel road surface of the main west–east street through the town, close to a high-status building, providing a strong indication of a nearby box shrub. Similarly, at Silchester Insula IX, a fragment of box leaf was recovered from the backfill of a well in the eastern area, adjacent to the main north–south street. Aside from the archaeobotanical evidence, indirect evidence for the presence of box plants comes from planting trenches at Fishbourne. Sampling for plant macrofossils and pollen was unsuccessful. However, distinctive bedding trenches were cut into the gravel and clay soil along the pathways of the formal garden of the Flavian palace. These were filled with loamy soil, strongly indicating the planting of box, which naturally grows in calcareous soils.[50]

Archaeological box leaves are typically described as ‘clippings’, implying that these are stems and leaves of box clipped off from a box shrub as it was shaped for topiary. Indeed, the box leaves recovered from a villa at Wiesweiler, Rhineland, have been described as having straight cut edges, which was taken as evidence that these shrubs had been trimmed for topiary.[51] Unfortunately, distinguishing between a box leaf which has been cut by shears and one which has fragmented during or post deposition is not clear, as the condition of box leaves is rarely noted in archaeobotanical reports. At Winterton villa, no report is available, but a photograph of the box remains clearly shows *c.* 4 cm lengths of box stem with attached leaves.[52] In contrast, at Skeldergate, York, detached leaves without stems were interpreted as dead leaves, rather than clippings from topiary.[53] Other potential ways to identify the management of box shrubs would be the presence of pruning scars on stems, indicating that the shrub had been previously pruned. Clusters of flowers are situated in the leaf axils of box plants, which flower in April and May.[54] At two sites box fruits have been recovered: Claydon Pike and Farmoor, both rural settlements in the Upper Thames valley. Although the river gravels do not represent the natural

[49] Van der Veen *et al*. 2008, 20.
[50] Cunliffe 1981; Farrar 2011.
[51] Meurers-Balke and Herchenbach 2014, fig. 4.
[52] Dimbleby 1978, 96.
[53] Hall *et al* 1980, 144.
[54] Fitter and Peat 1994.

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habitat of box shrubs, perhaps these plants indicate planted hedges, not closely trimmed into topiary bushes and hence retaining their flowers until the fruits developed. FIG. 5 shows the records of box classified by the parts recorded. In the majority of records (13), only leaves are present, not providing any evidence for topiary. Sprigs were present at five sites, but the majority of these are burials. At Chew Park, waterlogged worked wood, inner bark and leaves of box were recovered from a well, indicating that box was being used for woodworking.

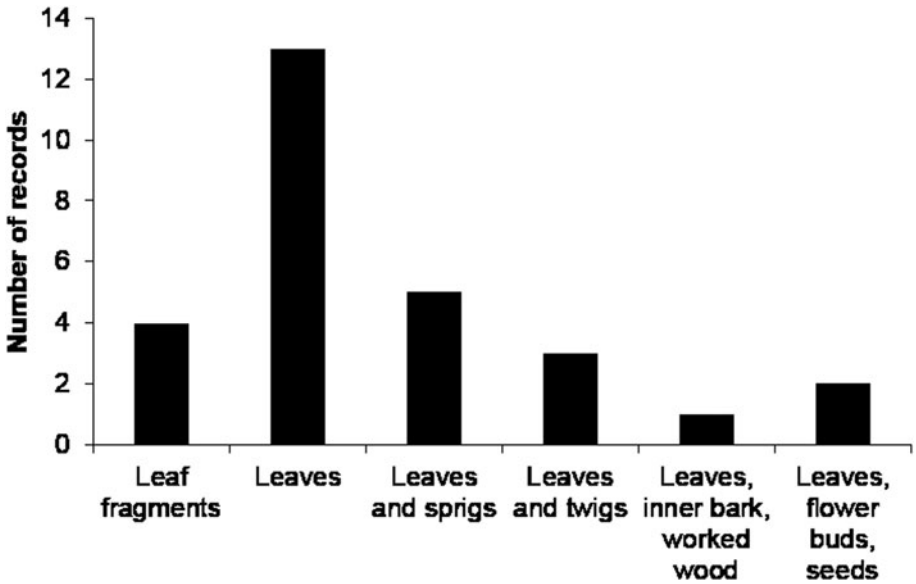

FIG. 5. Distribution of waterlogged box finds by part identified, where specified.

This review of the archaeobotanical records of box leaves has demonstrated that there are chronological and spatial trends in the presence of box plants. They were more common in towns than the countryside, and were more common over time.

STONE-PINE – *Pinus pinea*

The second imported evergreen plant recorded in Roman Britain is the pine tree, variously known as the Mediterranean, stone or umbrella pine. Stone-pine is an evergreen plant native to wide areas of the Mediterranean.[55] A wealth of material culture evidence from the Roman world shows the significance of the pine-cone symbol, from hairpins, to mortuary tombstones, to fountains.[56] Furthermore, artistic evidence shows the inclusion of stone-pine alongside other ornamental garden plants in garden frescoes.[57] Pine nuts, harvested from wild forests, were a common food item in Roman cuisine, featuring in the recipes of Apicius, and the nutshells occur in refuse deposits where sampled.[58] Ritual offerings including stone-pine cones and nuts are common

[55] Mutke *et al.* 2012.
[56] Lodwick 2015.
[57] Caneva and Bohuny 2003.
[58] Mutke *et al.* 2012; Murphy *et al.* 2013.

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occurrences within public temples, household offerings and at funerary sites.[59] Indeed, recognition of the role of pine cones in ritual offerings is long established.[60] However, the extent to which stone-pine trees were cultivated beyond the Mediterranean, and their interaction with humans beyond explicit ritualised occasions, have not been investigated. Stone-pine cones and nutshell are present in 41 records from Roman Britain, of which 23 are waterlogged, 15 charred and three unspecified (FIG. 6).

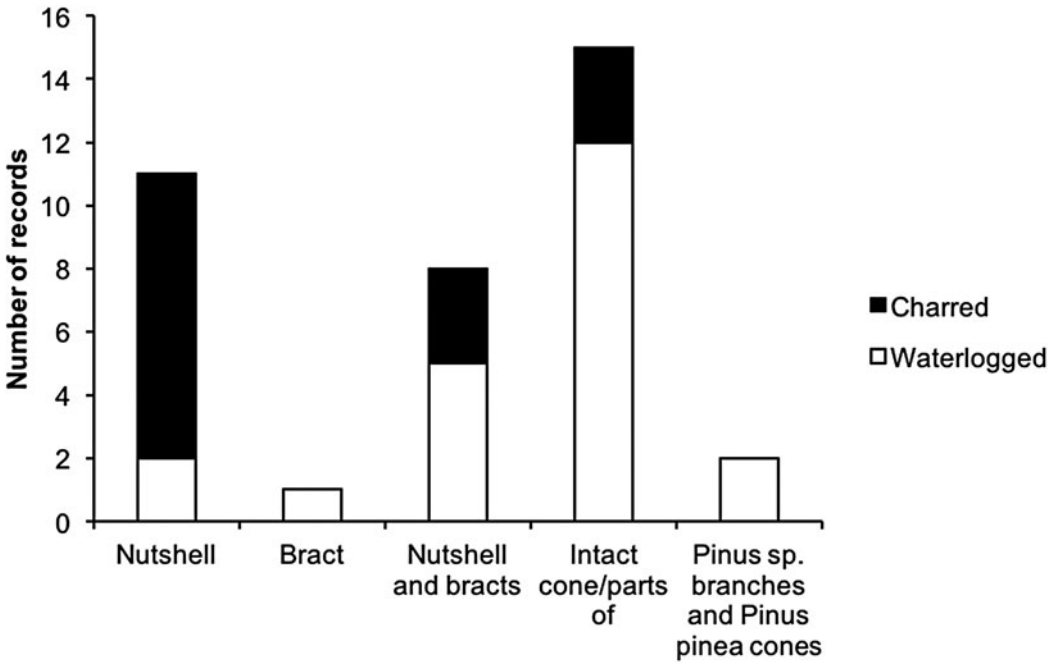

FIG. 6. Distribution of stone-pine finds by part identified and preservation, where specified.

The majority of these stone-pine finds derive from the major towns (16), while many of the other site categories are located within major towns, such as the Triangular Temple at Verulamium, the Romano-Celtic temple complex at Lower Brook Street, Winchester, and the funerary site at Finsbury Circus, London. Smaller numbers of stone-pine cone remains have been recovered from villas, religious, funerary and military sites (FIG. 7). The five funerary sites from which stone-pine remains have been recovered are all cremation cemeteries associated with a range of communities, from urban (Watling Street), to rural (Horcott Quarry, Mucking), to military (Doncaster). Rural finds of stone-pine consist of charred nutshell identified from roadside settlements and other rural sites in Essex, Hampshire and Kent, and whole cones from farmsteads at Chew Valley and Claydon Pike, as well as at several villas (Bancroft, Clatterford, Great Holts Farm, Lullingstone). Considering the profusion of excavated rural settlements in

[59] For instance, the Temple of Isis, Pompeii: Overbeck and Mau 1884, 108–9; Temple of Isis and Magna Mater, Mainz: Zach 2002; House of Amarantus, Pompeii: Robinson 2002; cremations in the Massif Central: Bouby and Marinval 2004; Northern Italy: Rottoli and Castiglioni 2011.

[60] Richmond and Gillam 1951; Kislev 1988. For review see Lodwick 2015.

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Roman Britain, there appears to be a genuine low presence of stone-pine in rural Britain beyond these villas and a few farmsteads.

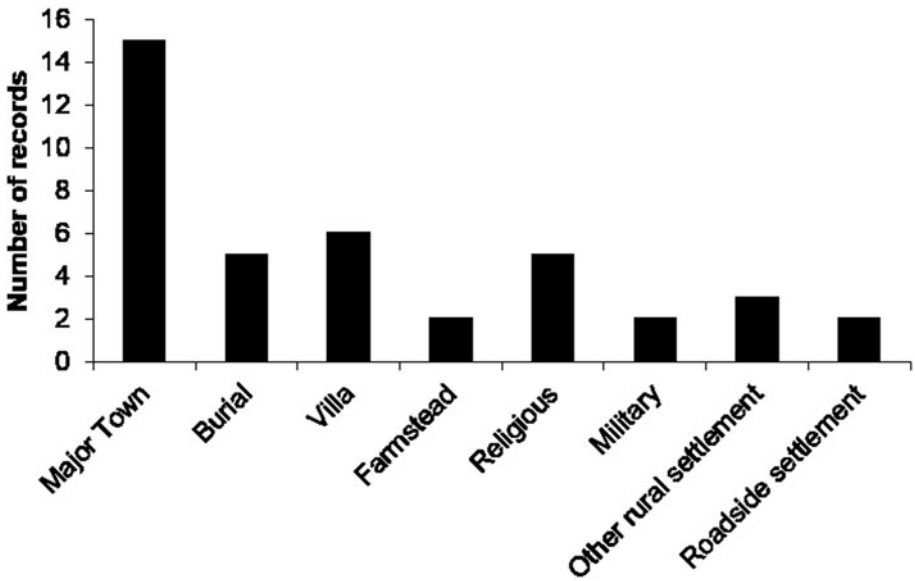

FIG. 7. Distribution of macrofossil finds of stone-pine by site type.

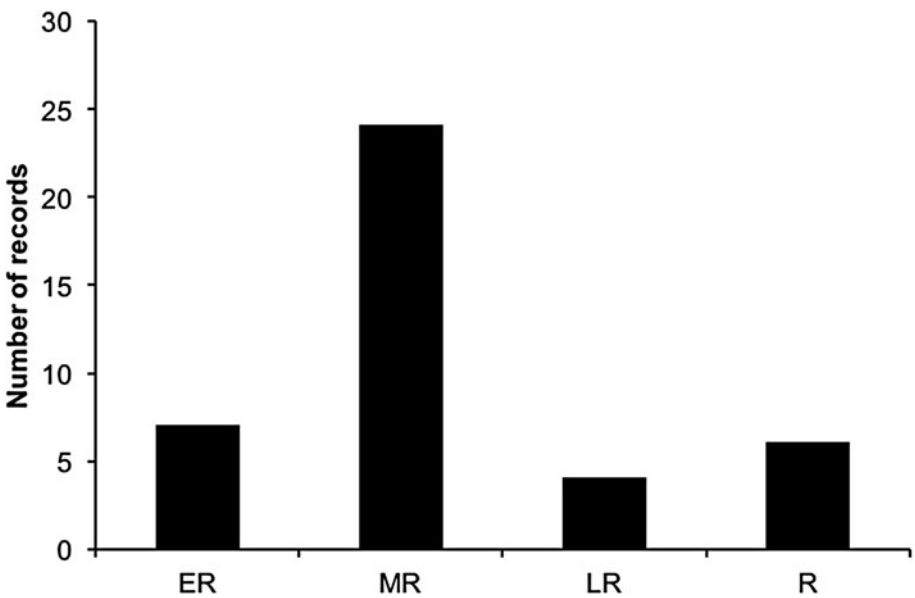

FIG. 8. Chronological distribution of macrofossil finds of stone-pine.

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The chronological distribution of stone-pine records (FIG. 8) shows that they are largely concentrated in the Middle Roman period, albeit with more Early Roman records than box. This pattern was also identified in the previous national review, which recorded *Pinus pinea* in 1.5 per cent of Early Roman, 3.5 per cent of Middle Roman and 2 per cent of Late Roman charred records.[61] Records from the second half of the first century are concentrated in the south-east of Britain, from the military fort at Alchester, occupation in London and Colchester, and the shrine site at Westhawk Farm, Kent. Middle Roman records are far more widespread, occurring also at rural farmsteads and villas, as well as in many records from towns and more widespread funerary and religious sites. The Late Roman records derive from three rural settlements (Fullerton villa, Newmans' End field-system and Chew Park farmstead) and sites in London. Of the broadly dated sites, some are more likely to derive from the Later Roman period (Bancroft and Low Ham villa). Stone-pine finds are more widely distributed than those of box (FIG. 9), as the majority are charred records found outside of areas with waterlogged preservation. There is a particular focus of records in London and surrounding settlements with numerous sites located in Kent.

This review of the range of sites from which pine cone remains have been recovered shows that archaeobotanical finds of stone-pine originate from a diverse range of activities. Previous work has shown that it is not possible to identify ritualised deposition of plant items based on archaeobotanical evidence alone, as there is no correlation between the density of stone-pine remains and sites with clear sacred uses.[62] Furthermore, taphonomic details which could provide insights into the depositional pathways of pine cone remains, such as fragmentation rate, and full quantification of nutshell and bracts were rarely included in the reports reviewed here. Regardless, a broad consideration of site, artefacts and archaeobotanical remains groups sites into four main categories. The first includes those where stone-pine cones or nuts were clearly associated with funerary activity and are recovered from the fill of cremation burials. In particular, pine cone remains were found alongside distinctive assemblages of material culture at two sites.[63] At Waterdale, Doncaster, finds from a cremation cemetery associated with a nearby late first-century fort produced pine nut, olive, date, fig, grape and lentil, alongside ceramic oil lamps, glass *unguentaria* and amphorae. A late second-century cremation at Mucking, Essex, included an *epula* deposit of the remains of a ritual meal, containing pine nuts, date, hazelnuts and around ten place-settings, each including a ceramic oil lamp, coin, *tazza*, beaker and platter. The second category of sites are those where stone-pine remains were recovered from within an area of sacred architecture, either as an *in-situ* offering (Verulamium Triangular Temple) or redeposited in a nearby pit or pool (Westhawk Farm, Springhead). At the third category of sites, stone-pine cones have been recovered from features which are plausible locations of structured deposition (waterholes, wells, ditches). Examples are Clatterford villa, where a ditch to the south of the villa building produced a cone, and Claydon Pike, where a cone was recovered some distance from the main settlement area in a waterhole. Finally, at seven sites, pine nutshell fragments have been recovered from typical occupation deposits, such as hearths and refuse deposits. Examples are low-density finds of charred fragmented nutshell at Newman's End, Essex, and Springhead Roman town. Additionally, branches identified as *Pinus* sp. and several stone-pine cones were recovered from a ditch outside the London amphitheatre. Regardless of which category a stone-pine record may fit into, stone-pine cones were clearly being consumed in Roman Britain as food or ritualised offerings. The more interesting question, whether they were also growing in Britain, will be addressed in the next section.

[61] Van der Veen *et al*. 2008, 20.
[62] Lodwick 2015.
[63] Waterdale, Doncaster: Miller 2013. Mucking cemetery: Evans and Lucy 2008.

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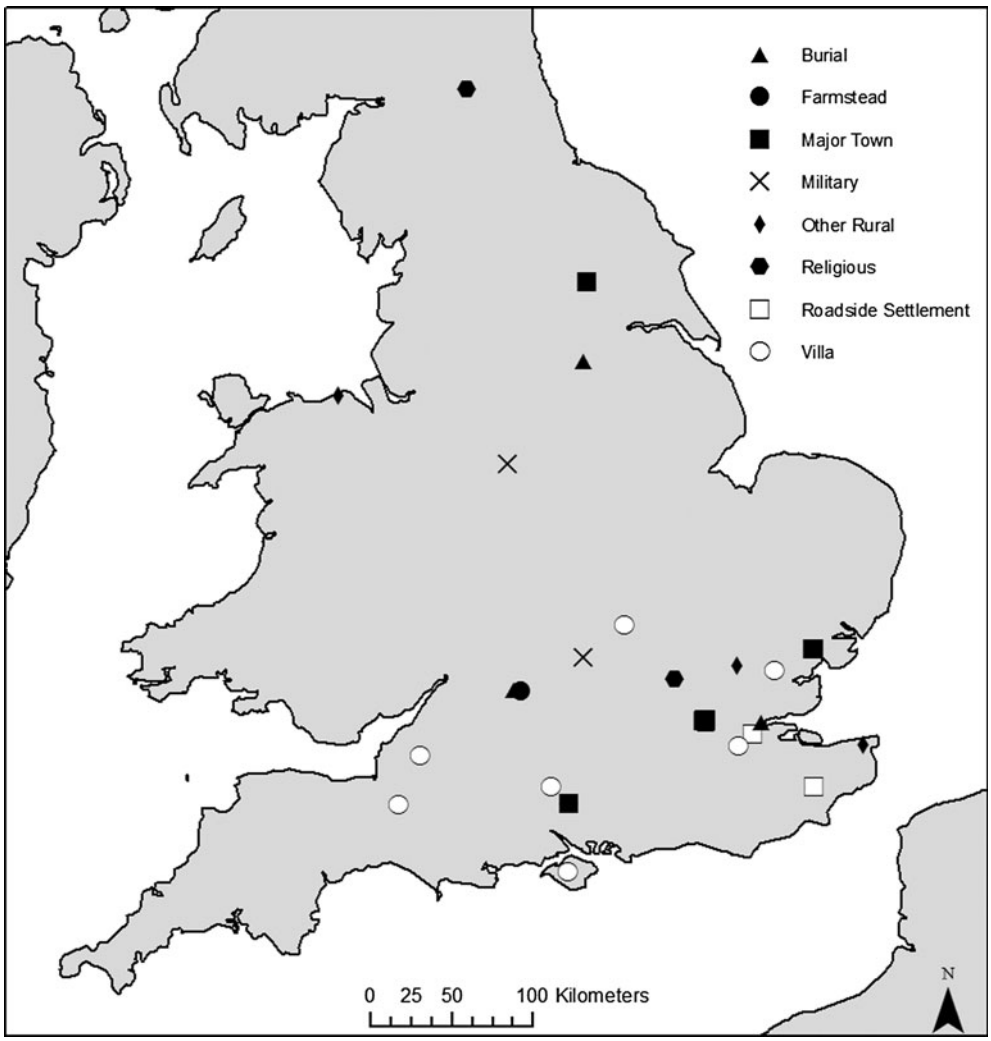

FIG. 9. Spatial distribution of macrofossil finds of stone-pine.

NORWAY SPRUCE – *Picea abies*

Norway spruce, the tree most commonly used as a Christmas tree in Britain today, is the third introduced evergreen plant to be recorded in Roman Britain. *Picea abies* grew in central and north-east Europe during the Roman period and, as with stone-pine and box, the use of norway spruce in the Roman world ranged from providing timber for buildings and ships, to featuring alongside box in painted garden scenes.[64] Plant remains have been found at only four sites in Britain. At Rectory Field, on the north-eastern outskirts of Roman Godmanchester, an extensive farmstead and later villa settlement produced substantial evidence for an ornamental garden

[64] Moser *et al*. 2012; Allevato *et al*. 2010; Caneva and Bohuny 2003; Giesecke and Bennett 2004.

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containing a range of introduced trees. Preliminary results include the identification of wood, leaves, twigs, cones and seeds of *P. abies* from the waterlogged sediments of several ponds. Wood identified from the site included yew, alder and hazel, while box leaves were also recovered; *P. abies* pollen was identified from other features.[65] Murphy has also stated that Pinaceae cones identified from the roadside settlement at Stonea Grange, Cambs., originally identified as *Pinus sylvestris*, the native tree scot's pine, were actually *P. abies*.[66] A possible record of needles originates from the London 1 Poultry excavations, where the same sample which contained laminated box leaves also produced cf. Pinaceae leaves.[67] Tentative evidence also comes from south-east England for the presence of *P. abies*, based on palynological records. At the site of Westhawk Farm, where charred stone-pine nutshells were recorded from the central pit of a shrine, *P. abies* pollen was recovered consistently from the upper 100 cm of a sample from a waterhole near to the shrine and was interpreted as originating from a nearby *P. abies* tree.[68] Indeed, Wiltshire has stated that *Picea* was growing more widely in south-east Britain in the Roman period. *Picea* pollen was recovered from the fills of a ditch dated to 100/50 B.C.–A.D. 50 from Zionhill's Copse, Hants.[69] *Picea* pollen was also recorded from various pollen cores from the Jubilee Line programme of excavation and coring in London. However, all occurrences of *Picea* are from undated cores or dated to the Iron Age. While the preservation of the *Picea* pollen was consistent with secure Holocene records, many of the deposits are fluvial with evidence for reworking; there is also a strong possibility of long-distance fluvial/marine transport of exotic pollen.[70]

OTHER IMPORTED ORNAMENTAL PLANTS

While not specifically evergreen plants, single records of two Roman ornamental trees are significant finds and require mention here. Archaeobotanical evidence indicates that the plane tree was introduced to southern Italy in the Roman period, according to Pliny the Elder, to provide shade. Plane also had a strong connection with philosophy through its association with the Platonic Academy and it featured commonly in public and private parks. For instance, it has been suggested that plane trees lined the portico gardens of Pompey in Rome.[71] A single seed of *Platanus orientalis*, oriental plane, was recovered from a second-century pit alongside various food remains (including celery, coriander, cherry, plum) on the site of a high-status building on the corner of Akeman Street and the Via Devana in the small town of Cambridge.[72] However, no archaeobotanical report was provided and this record must be treated with caution.

A single fragment of laburnum wood charcoal (cf. *Laburnum* sp.) was identified from an Early Roman grave at Springhead, Kent. This plant has pendent racemes or long lengths of yellow flowers and, alongside a fragment of the flowering plant traveller's joy (*Clematis vitalba*), may represent the purposeful selection of flowering plants for a funerary associated fire.[73] Beyond these ornamental taxa, the frequency with which archaeobotanical evidence for fruit trees such

[65] Murphy 2001, 17.
[66] Jackson and Potter 1996; Murphy 2001, 17.
[67] Davis 2011, 530.
[68] Wiltshire 2008.
[69] Wiltshire 2000.
[70] Scaife 2011, 116.
[71] Rosati *et al*. 2015; Marzano 2014, 216–17; Gleason 1994; Pliny the Elder, *Nat. Hist.* 12.6.
[72] Taylor 1999, 17. Pit F75, Shire Hall Site. No details of sampling procedure, specialist, preservation or quantified data are supplied. The pit was described as containing burnt material, suggesting a burnt offering may be the origin of this interesting assemblage.
[73] Barnett 2011.

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as plum, cherry and apple/pear is encountered in Roman Britain has led to suggestions that these trees were cultivated by the Middle Roman period.[74]

DISCUSSION

IMPORT OR CULTIVATION?

This review of archaeobotanical records for box, stone-pine and norway spruce in Roman Britain has demonstrated the presence of items originating from these trees, especially in Middle–Late Roman period London and other sites in the south-east of Britain. However, many of these items could potentially have derived from trade in plant parts rather than *in-situ* trees. For instance, fallow deer are represented by antler and foot bones in the Roman period of north-western Europe, suggesting the curation of these items as artefacts.[75] These two scenarios, of cultivation or import, have substantially different implications for understanding the effect of plants on people in Roman Britain.

In the case of box, some archaeobotanical examples do provide evidence of the use of box leaves and sprigs as items of material culture in burials. At Cann, box leaves were reportedly arranged in a wreath, while at Scole and Chesterford, concentrations of box leaves were reported around the chest and the skull respectively. Similarly, box leaves were found around a cremation urn at Bartlow Hills.[76] It is possible that these, and other fragments of box leaves from occupation deposits, derive from wreaths of box. Long garlands often featured in portico gardens, made from lengths of ivy, vine and smilax, while shorter garlands, wreaths and chaplets were made from scented plants, especially rose and violet, and, in the case of victory wreaths, laurel.[77] Imported plant foods, such as dates and figs, wooden artefacts and boxwood itself are known to have been traded throughout the Roman world.[78] However, the plausibility of wreaths of box leaves also being traded is here considered unlikely, as it is far more plausible that these box sprigs were from locally grown plants.

The debate over the native status of box in Britain has a long history. Godwin and, more recently, Mabey believe box to be native, citing charcoal identifications from the Neolithic site of Whitehawk Camp, Brighton, and a Flandrian pollen record from the Lake District, as well as Anglo-Saxon place-name evidence. However, the dating of the Whitehawk Camp charcoal record is considered dubious due to the presence of *Castanea sativa* (sweet chestnut), which is thought to be a medieval introduction.[79]

A recent review of box in Europe cites single grain pollen records from three sites in Britain dated to after *c.* 5000 B.C., albeit supporting this limited evidence with the mortuary evidence from Roman Britain, to argue for a native status.[80] In Sussex, a single pollen grain was identified from a pollen core taken from the Caburn valley, the level dated to 7217–6939 cal BP. A pollen sequence from Stafford had a single pollen grain, interpreted as dating to the Late Iron Age/Early Roman period, and a single pollen grain was recovered from Ellerside Moss,

[74] Van der Veen 2008, 102–4.
[75] Miller *et al*. 2016.
[76] Gray 1918; Fryer and Murphy 2014; Gage 1839.
[77] Farrar 2011, 135–8; Macaulay-Lewis 2008, 210; Kefalidou 2009, 40.
[78] Imported plant foods: Van der Veen *et al*. 2008. Wooden objects: Pugsley 2003. Boxwood transport: a shipwreck excavated at Commachio, dated to the late first century B.C., contained over 30 logs of long-growing Boxwood, Berti 1990, 53.
[79] Godwin 1975, 175; Mabey 1996, 254–6; Smith 2002, 31.
[80] Di Domenico *et al*. 2012.

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Lancs.[81] These are all sites where local areas of steep calcareous slopes, suitable for box, were present. The Strata Florida manikin, a figurine carved from boxwood and recovered from central Wales, has also been radiocarbon dated to 43 B.C.–A.D. 67.[82] These finds indicate that there was a small established population of box in Britain. In contrast, Coates has recently suggested that box was a Roman introduction to Britain based on the co-occurrence of villa sites with place-names stemming from box, such as Boxmoor villa. They offer the interpretation that so-called native box populations in these locations resulted from the planting of box in the Roman period.[83] A recent review of the status of box in northern France has also concluded that the shrub was introduced in the Roman period.[84]

Considering the spatial distribution of the box records synthesised in this paper, the site distribution is not a reflection of the underlying geology, as these settlements are not all on calcareous soils. The occurrence of box at archaeological sites in the non-calcareous areas of London, Silchester and York, as well as the Upper Thames and Ouse valleys, clearly shows that these are unlikely to be wild occurrences. However, it must be noted that calcareous soils are free draining, making the presence of waterlogged sediments and, hence, the recovery of box macrofossils very unlikely. The only finds from calcareous regions are leaves from a burial at Cann and charcoal from Westhawk Farm, Kent. While the native status of box continues to be debated, it is clear from this review of the Roman archaeobotanical data that the presence, and inferred use, of box plants on settlements is a phenomenon first recorded archaeologically in the Roman period and hence represents a major change in human relationships with box. Given the very limited presence of box prior to the Roman period, it seems plausible that at least some of the box plants growing in towns, villas and rural farmsteads were imported from the Continent rather than transplanted from the wild.

Norway spruce was present in central and north-east Europe by the Roman period, while no archaeobotanical records have been recorded in Holocene Britain before the Roman period.[85] Likewise, *Pinus pinea* is only native to the Mediterranean region, with no archaeobotanical records in Britain before the Roman period.[86] Positive evidence for the trade in stone-pine cones derives from the widespread occurrence of stone-pine cones and nutshells from regions beyond the native distribution of *P. pinea*, from the Eastern Desert of Egypt to Roman Britain. The find of 61 closed pine cones from a first-century B.C. shipwreck recovered off the coast of Toulon, southern France, provides direct evidence for their trade.[87] A Roman pottery shop at Colchester, destroyed during Boudica's rebellion in A.D. 60/61, produced evidence for various imported foods (lentils, figs, anise) as well as 27 nutshells and nine bracts, showing the early import of pine nuts to Roman Britain.[88] Kernels can survive for a long time within unopened nuts, while the extra transport costs of transporting unopened pine cones as opposed to extracted nuts is sizeable.[89] Hence, the recovery of pine cone bracts and intact, unopened cones strongly suggests that whole cones were purposefully imported. It is also possible that some pine cones were imported as plugs within wine amphorae. A shipwreck discovered at Albenga in Italy contained several wine amphorae sealed with pine cones. Columella suggested that the

[81] Bartley and Morgan 1990; Waller and Hamilton 2000; Oldfield and Statham 1963.
[82] Van der Sanden and Turner 2004.
[83] Coates 1999.
[84] Decocq *et al*. 2004.
[85] Giesecke and Bennett 2004; Tomlinson and Hall 1996.
[86] Mutke *et al*. 2012; Tomlinson and Hall 1996.
[87] Van der Veen 2011; Girard and Tchernia 1978.
[88] Murphy 1977, 85.
[89] Stevens 2011, 104.

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pine cones may also have been used to perfume and conserve the wine.[90] However, the more common materials used as amphora stoppers were cork, ceramic discs and wood.[91]

The vast majority of archaeobotanical records are only of pine cones with no needles or wood and, given the evidence presented in the previous paragraph, all are likely to have been imported. There are, though, two exceptions. At the Guildhall amphitheatre, London, branches identified as *Pinus* sp. were recorded as lining a ditch located outside the eastern entranceway of the amphitheatre. Several pine cones were recovered from the base of the ditch. The branches appeared to have been freshly cut, with branchlets and bark still attached, suggesting that a pine tree was growing locally and that the branches may have been prunings from this tree.[92] Considering the rareness of stone-pine cones and pine branches, it seems highly likely that these items derive from the same single stone-pine tree. The second site is Clatterford Roman villa on the Isle of Wight, where a stone-pine cone was recovered from a ditch to the south of the main villa building dating to the late third–early fourth century; *Pinus* sp. pollen was also recorded in samples from a trench to the south-east of the villa from a late third-century peat layer.[93] Scot's pine (*Pinus sylvestris*) is considered to be absent from southern Britain at this point, but the pollen could have conceivably been transported long distance by wind or trapped in the pine cone.[94] Elsewhere, the frequency with which stone-pine remains have been recovered in Kent, an area of calcareous soils suitable for stone-pine trees, has been held as good evidence for the presence of stone-pine trees in the Roman period.[95] The presence of a charred pine nutshell in an early fifth-century hearth at Fullerton villa,[96] in the Test valley, is intriguing given the substantial decrease in trade in this period. Beyond the specific example of the London amphitheatre, it is currently unclear to what extent stone-pine trees would have been encountered in Roman Britain.

THE MEANING OF EVERGREEN PLANTS

The evidence for the presence of introduced evergreen plants in Roman Britain, both in part and in their entirety, leads to the questions of what were the meanings of these plants and why were the plants and plant items imported. The abundant evidence for pine cones in the material culture record provides numerous inferences to their meaning. Stone-pine cones are clearly associated with mourning and the afterlife.[97] They occur on numerous mortuary monuments, including tombstones at Brough, Cumbria, and Overborough, Lancs., as well as carved in limestone from within a walled cemetery in Roman Southwark.[98] Pine cones are also strongly linked with regeneration and water, occurring commonly as finials on fountains well into the medieval period. This trend begins in the Roman period, most iconically on the Fontana della Pigna in the Vatican City, but also on a bronze water fountain from Pompeii.[99] Pine cones also have clear associations with numerous deities, featuring as incense in Mithraic rituals. The pine tree is central to the myth of Attis and Cybele, with pine cones featuring on a bronze figurine of Attis from London, on a pine branch held in a bronze hand from a Romano-Celtic temple at Hockwold-cum-Wilton on the fen edge, and on a pine tree depicted on an altar of Cybele from

[90] Columella, *De Re Rustica* 12.30.2; Lamboglia 1952, 146, 155–6.
[91] On stoppers from burials in Britain: Sealey 2009; Pliny the Elder, *Nat. Hist.* 16.34.
[92] Bateman *et al*. 2008, 114; Goodburn 1999.
[93] Busby *et al*. 2001, 111, 119.
[94] Bennett 1984.
[95] Campbell 1999; Pelling 2008, 357.
[96] Campbell 2008, 163.
[97] Alcock 1980, 54.
[98] *RIB* 75, 612, 714; Blagg 2000, 62; Alcock 1980, 54.
[99] Dalton 1920, 58–60; Walters 1899, 32, entry 2579.

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London. The Triangular Temple in Verulamium, where charred pine remains were recovered, has also been associated with Cybele. Pine cones also feature on copper-alloy hands linked to the god Sabazios, while Silvanus is often depicted with pine cones or fruit within a mantle.[100] Pine cones also feature occasionally in scenes of religious offerings, such as on a relief from Rome dedicated to Claudius Gothicus, on a third-century altar from Rome, or in the *lararium* painting at the Caupona of Euxinus, Pompeii.[101]

Box leaves feature less explicitly in religious life in the Roman world and do not appear as a common symbol or motif. The literary mentions of box clearly depict the plant's use in high-status ornamental gardens in Italy. Pliny the Elder describes in detail how to take cuttings of box for topiary bushes, while Pliny the Younger's description of his own garden layout has box hedges separating paths. In fact, the selection of box as an ornamental garden plant has been attributed largely to its suitability for topiary. While box does feature in fresco garden scenes, such as at the Villa of Livia, box was a native shrub of Italy. Unlike trees such as cherry, plane and citrus, it does not feature in the discussion of botanical imperialism whereby new species and varieties were introduced to Italy following military victories, sometimes explicitly featuring in military triumphs and being planted in public *horti* and the homes of the wealthy.[102] Boxwood is considered to have been a synonym for paleness. Box sprigs are used in the modern period as grave decoration and at funerals, while in France box is associated with immortality and eternity.[103] The cultivation of box shrubs in Roman Britain has been seen as a general indicator of an élite strategy of adopting 'Roman' status symbols,[104] yet the broader associations with mortality, combined with the mortuary evidence from Roman Britain, show that the shrub had a more diverse range of meanings.

Beyond explicit religious and literary associations, a broader range of evidence highlights the significance of evergreen plants in the past. Molecular analysis of resinous substances recovered from Late Roman 'package' burials across Britain has identified the presence of exotic resins including *Pistachia* sp. (mastic/terebinth), *Boswellia* sp. (frankincense/olibanum) and Pinaceae resins.[105] More broadly, the presence of ornamental gardens of exotic plants, alongside the evidence for game parks, has been interpreted as an association of the exotic with the sacred.[106] Evergreen shrubs have also been argued as having been sacred in the Iron Age. For example, a statue of a leader from the Glauberg, Hesse, had a headdress of the parasitic evergreen shrub mistletoe, while Pliny the Elder comments that mistletoe was sacred to Gaulish druids. The occurrence of holly and mistletoe alongside quernstone fragments, shoes and writing-tablets in wells has been suggested as significant, due to the occurrence of these plants in the gut contents of Lindow Man, found in late first-century B.C. to second-century A.D. Cheshire.[107] There is clearly a wide range of deities and meanings associated with evergreen plants, precluding the establishment of any single meaning from the recovery of plant remains. Furthermore, material culture studies have shown that an object has no inherent single meaning, but rather meanings are historically situated and are contingent upon interactions with events and people, which in turn varies depending upon a wide range of factors such as status, age

[100] For a summary see Crummy 2010, 63. Mithras: Bird 2004. Attis and Cybele: Green 1976, 212, 222; Tillyard 1917; Henig 1984. Sabazios: Eckardt 2014, 166. Silvanus: Dorcey 1992, 17.
[101] Fless 1995, 111; Elsner 2012, 139; Robinson 2002, 97.
[102] On literary mentions of box: Pliny the Elder, *Nat. Hist*. 16.18, 33, 17.35, Pliny the Younger, *Epistularum* 5.6. For a review see Braimbridge 2008. On the native status of box in Italy: Di Domenico *et al*. 2011. On discussions of botanical imperialism: Macaulay-Lewis 2008; Marzano 2014; Pollard 2009; Totelin 2012. On the association of boxwood with paleness: Pugsley 2003, 119.
[103] Mabey 1996, 256. France: Marinval *et al*. 2002 and references therein.
[104] Cunliffe 1981, 97; Zeepvat 1991, 59.
[105] Brettell *et al*. 2015.
[106] Sykes 2009.
[107] Aldhouse-Green 2004; Chadwick 2015, 41; Pliny the Elder, *Nat. Hist.* 16.95; Scaife 1986, 132.

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and gender.[108] In order to investigate the significance of introduced evergreen plants and pine cones in Roman Britain, it is perhaps more useful to consider how these trees and objects affected human experience, rather than what they meant or why they were grown.

DETECTING THE PLANTY AGENCY OF BOX

The review of archaeobotanical evidence for the presence of introduced evergreen plants in Roman Britain has clearly demonstrated that some people, living in towns, villas and rural farmsteads, were dwelling alongside box plants, while a very limited number of people were living alongside the entirely new plants stone-pine and norway spruce. Recent work in the areas of cultural geography and anthropology has both encouraged a change in how we perceive the agency of plants in relation to humans and presented a range of characteristics of plants which can be considered within an archaeological context. These developments closely parallel studies within the developing field of classical multi-sensory studies, which have considered the olfactory aspects of plants.[109] Propositions for the active agency of plants in relationship to humans stem from philosophical considerations of how plants have been sidelined in Western thought, advances in identifying how plants are reactive and affective organisms within chemistry and biology, and the use of the relational approach stemming from the object-focused studies inspired by the works of Latour and Gell to consider all people, objects and animals as being related, to the extent that 'objects and animals are actively involved in the processes of our world'.[110] Applying such relational approaches to plant remains has recently been conceived as 'plant materiality', but applications of these approaches have so far been limited.[111] Nearly a decade ago, Jones and Cloke argued for the need to be serious in the application of materiality to nature and, more recently, Head *et al*. have stated that: 'Attention to the specific capacities of plants is important to understand the specifics of relationality and distributed agency in human-plant encounters'.[112] To do so, it is necessary to highlight particular material characteristics of plants which can be applied to archaeobotanical material.

Within the field of human-plant studies, several features of plants have been shown as key to affecting humans in some way. Here it will be demonstrated that these can be usefully applied to archaeobotanical material. Indeed, a major advantage of applying relational approaches to plant remains is that we can easily move from the species identification of a plant macrofossil, to having a fairly accurate understanding of the vibrancy the source plant had in its past life in terms of colour, temporality, smell, tactility and growth structure. Although it must be emphasised that attempts to detect planty agency are still developing, that is the effect of unique characteristics of plants on people,[113] here the factors of visual appearance, smell, physicality and temporality are considered in relation to archaeological evidence for imported evergreen plants. The visual appearance of plants within gardens is highlighted in ethnographic studies of gardeners in Britain, for instance Hitchings' ethnographic work on allotments which showed that people became attached to plants with perceived greater aesthetic qualities.[114] Pitt focused on observations of the visual aspects of plants through time-lapse photography within community gardens to detect changes in the growth of seedlings and changes in foliage and flowers, which alerted her to planty agencies.[115]

[108] Gosden and Marshall 1999; Kopytoff 1986; Eckardt 2014.
[109] Draycott 2015; Betts 2011.
[110] Hall 2011; Daly *et al*. 2016; Thomas 2015, 1289.
[111] Van der Veen 2014; Sykes 2009, 30.
[112] Jones and Cloke 2008, 80; Head *et al.* 2014, 864.
[113] Brice 2014; Pitt 2015; Head *et al*. 2014.
[114] Hitchings 2003.
[115] Pitt 2015.

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While not prominent within cultural geography, olfactory senses have received focus within classical multi-sensory studies. Smell is a pervasive sense which freely enters the body. The reception of smell is specific to individuals and cultures, yet techniques such as sensory maps have proved useful in considering the organisation of urban societies and the quality of life of the inhabitants.[116] Recently, Draycott has highlighted how evergreen plants, such as box, as opposed to deciduous plants, would smell all-year round.[117] The physical aspects of plants, that is their growth habit and form of reproduction, have also been shown to affect the formation of human-plant relationships. For instance, the selection of plants on pedestrian streets in Paris affected how people inhabited these streets, changing them from places of movement to places of dwelling.[118] Binding these aspects of plant materiality together is the temporality of plants, notably considered by Ingold, allowing us to consider how daily, seasonal and annual rhythms of plants affect humans and bind them up within the life of a plant. For example, a recent study of Australian vineyard workers encapsulated how the 'ecological temporalities' of plants, namely temporal changes in smell, colour and fruiting time, strongly affected the labour patterns and emotions of workers.[119]

FIG. 10. Image showing the leaves and flower buds of a box shrub.

[116] Bradley 2015a; Hamilakis 2011; Koloski-Ostrow 2015.
[117] Draycott 2015, 67.
[118] Pellegrini and Baudry 2014.
[119] Temporality: Ingold 1993; Brice 2014; Draycott 2015. Appearance: Hitchings 2003; Pitt 2015. Olafactory: Draycott 2015.

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Considering these aspects of the most widely occurring plant, box, we can gain insights into how box would have contrasted with the wider flora of Britain and the effects this might have had on people. Box has glossy green leaves (FIG. 10), which remain on the shrub throughout the year. Small white flowers appear in the spring, but the shrub has largely the same appearance year round. Box has a highly distinctive smell, described by Mabey as 'malodorous',[120] due to the presence of certain phenolic compounds, the production of which subtly varies with season.[121] Box shrubs are slow growing, but long lived, and can be grown easily from small cuttings. Plants typically reach up to 5 m tall, with dense foliage and toxic leaves unpalatable to herbivores.[122] Unifying these aspects is the temporality of box shrubs. Their appearance remains the same throughout the annual cycle, in contrast to the majority of deciduous plants in Britain. Furthermore, the long life-span of box means we can see shrubs as permanent fixtures in the lives of humans, in the same way that the temporality of Ingold's pear-tree is 'consonant with that of human dwelling'.[123] Several evergreen plants were native to Britain: holly, yew and juniper, and scot's pine surviving in Scotland. The evergreen nature of these plants means that they represent the same ecological temporality as box. However, box differs by being more compact in its growth habit, non-edible to animals and a new occurrence in most areas of Roman Britain. While the archaeobotanical record of these native evergreen plants has not been interrogated, the argument for box as a Roman introduction presented in this paper, combined with the evidence for this shrub being present within settlements, shows that new human-plant relationships would have been experienced.

Keeping these planty agencies in mind, the box shrub, which can be considered to have been growing on the edge of a busy road through Roman London at 1 Poultry, can be seen as acting as a physical barrier between a private property and a public thoroughfare;[124] a boundary which would not be damaged by animals and would provide both a physical and visual barrier between public and private property. Yet the distinctive visual and olfactory aspects of box, which contrast strongly with other native flora in Britain, would mean that this area of town had a distinctive multi-sensory landscape in comparison with other parts, while also encouraging people to dwell within the space and consider the novelty of a plant rarely encountered. The differing temporalities of box would mean that the sense of time and dwelling within the world would subtly differ between those urban inhabitants and visitors to London, Silchester and York, who were experiencing this plant on a daily basis, and the inhabitants of rural Roman Britain. Box has been recorded at five villas, as well as Fishbourne, and only four farmsteads, which given the far larger number of farmsteads studied archaeobotanically than villas, shows a contrast also between the ecological temporality of high-status villa dwellers and farmers. Where box has been recorded at farmsteads, the presence of leaves and fruit fragments at Farmoor and Claydon Pike suggests the plants were perhaps not managed as they were at the many urban and villa sites where only leaves are recorded, while the most common interaction of farmers with the natural world might have lessened the contrast between the temporality of box and that of the few native evergreen plants. Not only would urban and high-status villa dwellers no longer be included in the cycles of agricultural time, they would be encountering a new plant which obscures temporal changes between the seasons.

This section has followed material-culture studies by extending relationality to plants and considering physical characteristics of box as aspects of plant materiality. However, to truly advance the study of the Roman world, we need to consider what is distinctive about what

[120] Mabey 1996, 254.
[121] Bernal *et al.* 2013.
[122] Stace 2010, 122; Borchard *et al.* 2011.
[123] Ingold 1993, 168.
[124] Interpretation following Hill and Rowsome 2011, 433.

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plants did, as opposed to what material culture such as *terra sigillata*, or lamps, or brooches did. The key aspects of plant materiality that have been highlighted — temporality and smell — are on the basis that a plant is a living being, grounded in the ecological world. While plants could be translocated across the Roman world for a range of human motivations, once planted in the ground they created a new ecological niche, becoming enmeshed in the soil and the ecosystem. Following this train of thought, we can advance that plants did two key things. First, they changed the local environment, in terms of biodiversity, soil characteristics, insects and animals. Being tethered to the spot, plants would have affected the daily experience of thousands of people, in contrast to the personal relationships of individuals with portable material culture. The changes that plants made to the lived environment of the settlement would thus have affected the way the wider community experienced the world, as well as factors of health and well-being. The second point is that by being a living life form, box also became part of the living legacy of Roman Britain. Box became increasing common through the Roman period (FIG. 4) and made a long-term contribution to the vegetation communities and landscape of the island.[125]

RITUALISED DEPOSITION AND SENSORY EXPERIENCE

In the case of stone-pine cones, it is possible to consider the sensorial aspects of ritualised activities due to the recovery of the *in-situ* remains of offerings from several temples in Roman Britain. Whole stone-pine cones and pre-prepared stone-pine cone incense were being used within burnt offerings. Further to the considerations above of the experience of smell within urban space, Hamilakis has written on the sensory experience within Mycenaean sanctuaries, whereby the marked sensory experiences of burning flesh within dark enclosed spaces would have produced a strong and unified experience for those participating in the ceremonies.[126] Smellscapes would be very variable and affected by a myriad of local conditions, such as wind and architecture.[127] The distribution of the smell of burning pine cones thus would have been affected by the condition and quantity of pine cones, how they were burnt, where the offering took place and, above all, the lived experience of the individual making the offering. The consideration of the sensorial aspects of pine-cone smells does, though, increase our understanding of the effects of offerings in past places.

While the burning of plant material and wood occurred on a daily basis in Roman Britain, in the hearth, corn-drier or hypocaust, offerings of stone-pine cones would have produced a distinct sensory experience. Pine trees are considered to have been absent from southern Britain by at least 2000 B.C.,[128] and stone-pine cones were rare imports. Stone-pine cones have a distinctive smell due to the presence of the compounds limonene and α-pinene.[129] Where spatial evidence is available, records show that the remains of offerings containing stone-pine cones occurred within closed spaces, for instance in the Triangular Temple at Verulamium and at the Carrawburgh Mithraeum. At the first of these, charred pine cone remains were deposited within various pits within the temple, while at the Carrawburgh Mithraeum they were buried beneath new altars, or, in the case of pre-prepared pine cones, stored in an enclosed bunker.[130] These patterns indicate that the sensory experience of offering pine cones would have been restricted to the individuals visiting the temple, perhaps within a few hours. Beyond the strong and exotic

[125] Witcher 2013.
[126] Hamilakis 2011.
[127] Henshaw 2014, 42–56.
[128] Bennett 1984.
[129] Macchioni *et al.* 2003.
[130] Richmond and Gillam 1951.

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smell, the visual aspects of flickering light produced by burning stone-pine cones would also heighten the sensory experience. In contrast, offerings made at the military enclosure at Orton's Pasture, Staffs., were conducted in the open; here we can imagine the smell from at least one burning pine cone drifting over the wider military camp.[131] Intriguingly, the deposition of the charred pine cone remains took place within a pit where layers of sand separated individual offerings. Once the strong multi-sensory aspects of the offering were experienced, the smell was soon closed off.

EVERGREEN PLANTS BEYOND BRITAIN

The archaeobotanically well-studied province of Britannia has been the focus of this article, but evergreen plants were also being encountered in ornamental gardens and ritual activities across the Roman world. Examples are presented here which indicate the range of locations in which ornamental plants have been recorded.[132] From Italy, a growing body of archaeobotanical data is beginning to provide evidence against which that of frescoes and literary evidence can be compared. At Modena, on the southern edge of the Po valley, box pollen has been identified from the Ex cinema capitol site, while waterlogged plant remains of cypress (*Cupressus sempervirens*), myrtle (*Myrtus*), plane (*Platanus*) and yew (*Taxus*) have been identified from the site of a Roman *domus*.[133] In Sicily, the presence of box shrubs has been suggested at the Greco-Roman theatre at Taormina, albeit the *Buxus* pollen was identified from undated pollen cores.[134] Plant macrofossils of box are also known from France and Germany. Excavations at a rural nucleated settlement at La Queue de Rivecourt, in the north-east of the Paris basin, recovered leaves and a seed of box, as well as an intact pine cone from a large pit near to some small private baths. This finding was reported as only the second find of box in France and was interpreted as evidence of a box shrub growing nearby.[135] In Germany, box leaves, seeds and pollen were identified from a villa at Wiesweiler in the middle Rhine region.[136] In Cologne, waterlogged box leaves have been recovered from a borehole sample in an area beyond the Roman town walls on the west bank of the Rhine, dated to the first/second century, while there are also unpublished finds from Xanten.[137]

Archaeobotanical evidence for *Pinus pinea* in Europe corresponds with the evidence from Britain of pine cones being used in both ritualised and culinary contexts. The most recent summary of central Europe, which reported *Pinus pinea* remains in fewer than ten sites out of a database of 400, includes finds from both domestic contexts at the villa at Worb-Sunnhalde, Switzerland, and Vindonissa and from temple contexts in Mainz, Empel and Nijmegen.[138] Subsequently, the identification of *Pinus pinea* nutshell and cones has been reported from wider areas of Europe. In Rome, stone-pine cones were recovered from the fountain of Anna Perenna, alongside offerings of curse tablets, oil lamps and lead containers with figurines.[139] *Pinus pinea* remains have also been recovered from the east of the Empire, from settlements in Bulgaria, including the necropolis at Apolonia and the fort of Abritus, in Croatia at Veli Brijun,

[131] Monckton 2000.
[132] A review of macrofossil finds of box in Europe can be found in Appendix tables S2 (pollen) and S3 (macrofossils) of Di Domenico *et al*. 2012.
[133] Bosi *et al*. 2015.
[134] Mercuri *et al*. 2006.
[135] Marinval *et al*. 2002.
[136] Meurers-Balke and Herchenbach 2014 for an overview of mid-Rhine finds and Gaitzsch *et al*. 1989 for the full report of the Wiesweiler villa.
[137] Knörzer and Neu 1998 — reported as only the third find of box leaves from Germany.
[138] Bakels and Jacomet 2003.
[139] Piranomonte 2015.

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in Caesarea harbour, Israel, and from Quseir al-Qadim, Egypt.[140] A full review is beyond the scope of this paper, but it is clear that stone-pine cones were being traded throughout the Roman world. Unlike box, there is no known evidence for the ornamental planting of pine trees in Europe beyond their native distribution.

CONCLUSIONS

This synthesis of archaeobotanical data from a Roman province, which has benefited from intensive archaeobotanical investigation, has shown that the movement of ornamental plants into the north-western provinces was occurring in parallel with the movement of fruit and nut trees. There is widespread evidence for the cultivation of box, with the strong likelihood that some shrubs were introduced from the Continent, while box became a common feature in towns from the second century onwards. Norway spruce trees were introduced to Roman Britain on a small scale and there is debatable evidence for the cultivation of stone-pine trees in London. While stone-pine and, to a lesser extent, box have varied strands of meaning, drawn from literary and artefactual evidence, a consideration of plant materiality, that is the visual, olfactory and temporal aspects of these evergreen shrubs, has provided new insights into how they affected the experience of life for those encountering them in towns and in temples. We can never know what people experienced in the past, sensory reception being socially situated, but by starting from the point of known physical characteristics of plants, we can at least explore the variation in certain sensory experiences. The consideration of plants as vibrant living beings could also contribute in the future to numerous strands of study, including globalisation studies, the articulation of social status, funerary activities and the manipulation of the built environment, as well as long-term ecological studies, which currently overlook the introduction of evergreen plants.[141]

The long-term impact of these plants in Britain is variable. Unlike stone-pine and norway spruce, populations of box shrubs are known from written evidence from the Domesday period and are now considered a native aspect of British flora. In order to more fully evaluate the changing human-plant relationships, biomolecular methods, namely DNA, will be required to establish the origins of present and past populations of box in Britain. There is growing evidence for the cultivation of introduced evergreen plants elsewhere in the Roman world, hence the continued application of archaeobotanical methods is vital to allow the evidence from Britain to be evaluated more broadly. It is hoped that the archaeobotanical evidence presented here will inform the discussions based upon the literary, artistic and architectural evidence for plant introductions to and from Italy. Much work within the Roman world over the last decade has focused on demonstrating the material agency of objects. It is perhaps time to give more consideration to the living beings in the Roman world.

[140] Bulgaria: Popova 2010; Croatia: Šoštarić and Küster 2001; Israel: Ramsay 2010; Egypt: Van der Veen 2011.
[141] Peterken 2001.

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APPENDIX TABLE 1. RECORDS OF BOX MACROFOSSILS IN ROMAN BRITAIN

Site	Location	Site type	Period	Parts preserved	Context	Reference
1 Poultry	London	Major town	A.D. 250–300	Waterlogged leaves	Road surface	Davis 2011, 530
12 Arthur Street	London	Major town	A.D. 120/5–180/200	Waterlogged leaves	Waterfront infill deposits	Roberts 2008
132–7 Upper Thames Street	London	Major town	Roman	Waterlogged leaves	–	Cowan and Hinton 2008
15–35 Copthall Avenue	London	Major town	Roman	Waterlogged leaves	–	Maloney and de Moulins 1990, 85
30 Gresham Street	London	Major town	Roman	Waterlogged leaves	–	Cowan and Hinton 2008
Bartlow Hills	Cambridgeshire	Cremation	Late 1st/early 2nd century	Leaves and branches entwined around lamp, leaves adhering to base of cremation urn and surrounding area	Cremation urn within tumulus	Gage 1839; Eckardt *et al.* 2009
Bedern	York	Major town	A.D. 300–450	Waterlogged leaf fragments	Well fill	Kenward *et al.* 1986, 263
Cann	Dorset	Burial	Roman	Large numbers of leaves and short sprigs at head end, interpreted as a wreath of box leaves	Child's burial in a lead coffin	Gray 1918
Chesterford churchyard	Essex	Burial	Roman	Intact leaves and twigs	Leaves in soil around inhumation, near skull and vase	Gage 1839; Walters and Stow 2001, 126
Chew Park	Somerset	Complex farmstead	A.D. 300–50	Waterlogged worked wood, inner bark and leaves	Villa well, south-east of winged corridor villa/farmstead	Stant and Metcalfe 1977
Claydon Pike	Cotswold Water Park	Complex/ enclosed farmstead	Mid–late Roman	Waterlogged leaves, seeds, flower buds, twigs and fruits	Waterhole, pit and drainage sump	Robinson 2007, 361
Drapers' Gardens	London	Major town	Second half of first century	Waterlogged leaves	Ditch	Batchelor *et al.* 2011 Butler and Ridgeway 2009
Farmoor	Oxfordshire	Enclosed farmstead	Fourth century	Waterlogged leaf and fruit fragments	Pit and waterhole within rural settlement	Lambrick and Robinson 1979, 127

Frocester	Gloucestershire	Villa	Fourth–fifth century	Charcoal	Large masonry house with formal garden	Price 2000, 258
General Accident Site/Tanner Row	York	Major town	A.D. 150–350	Waterlogged leaves and green twigs	Accumulation/levelling deposits, well fill	Hall and Kenward 1990, 399
Godmanchester	Cambridgeshire	Villa	Roman	Waterlogged leaves	Ponds	Murphy 1998
Insula IX	Silchester	Major town	A.D. 200–50	Waterlogged leaf fragment	Well adjacent to north–south street	Robinson 2011a
Marcham	Oxfordshire	Religious	Roman	Waterlogged leaves	Well	Kamash, pers. comm.
Marsh Leys, Kempston	Bedfordshire	Farmstead	Late 3rd/4th century	Waterlogged leaf fragments	Well	Robinson 2011b
New Royal Baths	Bath	Religious	A.D. 150–60	Waterlogged twigs	Ditch, near possible formal gardens	Davenport *et al.* 2007, 33
Piccadilly (50)	York	Major town	Roman	Waterlogged leaf fragment	Ditch	Carrott *et al.* 1992
Pit XIII in east of town, and from an area in the north-east	Silchester	Major town	Roman	Text: waterlogged leaf clippings. Collections: waterlogged whole leaves	Pit	Lodwick 2016
Regis House	London	Major town	Roman	Waterlogged leaves		Cowan and Hinton 2008
Roden Down, Compton	Berkshire	Burial	Post- A.D. 364	Leaves and young stems by head and legs, and lining the floor	Floor of lead-lined wooden coffin, grave of woman 50+	Allison, 1947; Hood and Walton 1948
Rougier Street	York	Major town	A.D. 150–200	Waterlogged leaves	Ditch	Hall and Kenward 1990, 399
Scole	Norfolk	Inhumation	Early–mid-second century	Waterlogged leaves	Child inhumation. Isolated burial south of the east–west Roman road, isolated burial near to roundhouse. Leaves of box and Atropa belladonna seeds from the chest area	Fryer and Murphy 2014
Skeldergate	York	Major town	Late fourth century	Waterlogged leaves, all detached from stems, no woody fragments. Interpreted as dead leaves, not clippings	Well, 6 out of 7 fills	Hall *et al.* 1980, 144

Continued

APPENDIX TABLE 1. CONTINUED

Site	Location	Site type	Period	Parts preserved	Context	Reference
Stanwick	Northamptonshire	Villa	Third and fourth century	Waterlogged leaves and stalks	Wells	Campbell 1995
Stonea	Cambridgeshire	Roadside settlement	A.D. 140–220	Charred leaflet	–	Van der Veen 1996
Westhawk Farm	Ashford, Kent	Roadside settlement	Roman	Charcoal	Ditch, hearth and pits	Challinor 2008
Winterton Villa	Lincolnshire	Villa	Roman	Waterlogged leaf clippings	–	Lambrick and Robinson 1979, 127; Dimbleby 1978, 96

APPENDIX TABLE 2. RECORDS OF STONE-PINE MACROFOSSILS IN ROMAN BRITAIN

Site	Location	Site type	Period	Parts preserved	Context	Reference
1 Poultry	London	*Colonia*	A.D. 65–125	Waterlogged intact cones, loose bracts and nutshells	Dumps around water tank	Davis 2011
45–46 High Street	Colchester	Fortress	A.D. 60/61	Charred nutshells and bracts	Pottery shop	Murphy 1984, 32
Alchester vexillation fortress	Alchester	Fortress	*c.* A.D. 47	Waterlogged cone fragments and nuts	Fort ditch sediments	Booth *et al.* 2007, 281
Bancroft villa	Buckinghamshire	Villa	Roman	Waterlogged cone	Ditch fill, to south of enclosure and rectangular structure	Pearson and Robinson 1994
Billingsgate buildings	London	Major town	Late first/early second century	Waterlogged bracts and nuts	–	Willcox 1977; 1980
Bustum burial, Watling Street	Southwark, London	Major town	Late first/early second century	Charred nutshells, bracts, central part of cone	*Bustum* burial pit	Giorgi 1997
Carrawburgh Mithraeum	Hadrian's Wall	Religious	Third century	Charred intact cone and derived fuel	Mithraeum	Blackburn 1951; Smythe 1951

Cathedral Car Park	Winchester	Major town	A.D. 250–300	Waterlogged intact cone	Well	Biddle and Quirk 1964; Murphy 1977
Chew Valley Lake	Somerset	Complex farmstead	*c.* A.D. 300–50	Bracts and nutshells	Well	Rahtz and Greenfield 1977, 366
Clatterford villa	Isle of Wight	Villa	Late third century	Waterlogged intact cone	Ditch	Busby *et al.* 2001
Claydon Pike	Gloucestershire	Complex farmstead	Early second to early fourth century	Waterlogged intact cone	Waterhole	Robinson 2007, 361
Copthall Avenue	London	Major town	Early–mid-second century	Waterlogged cones (*Pinus* sp.)	Channel	Maloney and de Moulins 1990, 31
Doncaster	Waterdale	Funerary site	A.D. 70–200	Charred nutshells, including kernel	Cremation burials	Miller 2013
Finsbury Circus	London	Cemetery	Second century	Waterlogged nutshell	Roadside ditch, near to cemetery	Davis 2015
Fullerton	Hampshire	Villa	Early fifth century	Charred nutshell fragments	Tiled hearth within central hall of Late Roman villa	Campbell 2008
General Accident Site	York	Major town	A.D. 150–200	Waterlogged nutshells	Accumulation deposits	Hall and Kenward, 1990
Great Holts Farm	Boreham	Villa	Third century	Waterlogged nuts and bracts	Well fill	Murphy *et al.* 2000
Guildhall amphitheatre	London	Major town	A.D. 125–late second century	*P. pinea* cones and *Pinus* sp. branches	Ditch fill and fence along ditch	Goodburn 1999; Bateman *et al.* 2008
Head Street	Colchester	Major town	A.D. 70–late second century	Charred kernel fragments	Pit	Fryer 2004
Horcott Quarry	Upper Thames Valley	Funerary site	A.D. 100–350	Charred nutshell	Cremation burial	Lodwick and Challinor forthcoming
Low Ham Villa	Somerset	Villa	Roman	Two waterlogged cones	–	Rahtz and Greenfield 1977, 365
Lower Brook Street	Winchester	Major town	Second century	Cone	Pit associated with Romano-Celtic temple	Ross 1975
Lullingstone Villa	Kent	Villa	Late second century	Waterlogged nuts and bracts	Well	Doherty 1987

Continued

APPENDIX TABLE 2. CONTINUED

Site	Location	Site type	Period	Parts preserved	Context	Reference
Monkton-Mount Pleasant	Isle of Thanet	Nucleated settlement	A.D. 150–250	Charred nutshells	Pits associated with roadside settlement	Pelling 2008
Mucking, Romano-British Cemetery II	Essex	Funerary site	Later second century	Charred pine kernels and nutshell fragments	Cremation burial 911, *epula* deposit of 10 place settings	Evans and Lucy 2008
New Royal Exchange	London	Major town	Roman	Fir cone	Gravel pit	Tite 1848
New Fresh Wharf	London	Major town	First and second centuries, late second and third, third and fourth centuries	–	Waterfront deposits	Willcox 1977
Newman's End	North-west Essex	Field-system	Fourth century	Charred nutshell fragment	Field-system	Carruthers 2000
Orton's Pasture	Rocester	Fort annex	Early second century	Charred nuts, nut fragments, kernels, bracts and cone apex	Pit within enclosure, possible shrine	Monckton 2000
Prestatyn	North Wales	Industrial settlement	Mid- to late second century	Waterlogged intact cone, nuts and bracts	Well	Jones 1989
Regis House	London	Major town	Roman	Waterlogged nut fragments and bract	Near quayside	Bateman *et al.* 2008, 115
Roman riverside wall	London	Major town	Third century	–	Layer	Willcox 1977
Springhead, 1994 pipeline	Northfleet, Kent	Roadside settlement	Mid–later second century	Charred nutshell fragments	Occupation overlying hearth within building	Campbell 1999
Springhead, sanctuary complex	Northfleet, Kent	Religious	Early–mid-Roman	Charred bracts and nutshell	Spring infill in front of shrine, chalk quarries	Stevens 2011
Temple of Mithras	London	Major town	First–second century	Pine cone (type not specified)	Floor of nave of Mithraeum	Grimes 1968, 114
Triangular Temple, Insula VII	Verulamium	Major town	Early second century	Charred bracts and kernels	Pits within pits	Wheeler and Wheeler 1936
Upper Thames Street	London	Major town	Early third century	Waterlogged bract	Dumped riverside deposit	Willcox 1980
Westhawk Farm	Ashford, Kent	Roadside settlement	A.D. 70–150	Charred nutshell	Central pit of shrine structure	Pelling 2008

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Department of Archaeology, University of Reading
l.a.lodwick@reading.ac.uk

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