CHAPTER 9

THE PLACE OF DEVELOPER-FUNDED ARCHAEOBOTANY IN ELUCIDATING THE FOOD SUPPLY OF THE TOWNS OF ROMAN BRITAIN

By Mark Robinson

INTRODUCTION

This review will concentrate on evidence from the provincial capital of London, the *civitas* capitals and the *coloniae*, but evidence will also be brought in from smaller towns to illustrate points that are regarded as applicable to the larger towns. The historical development of archaeobotany and recent research-funded work on food plant remains from Romano-British towns will be considered in order to place the developer-funded work in its context.

Archaeobotanical research on diet in Romano-British towns can be divided into three periods. The pioneering phase in which a basic plant record was established spanned 75 years from *c.* 1900 until *c.* 1975. There was then very rapid progress in the 15 years from 1975 until 1990 when archaeobotanical sampling became normal on excavations, techniques were developed and standards were established. These advances were greatly facilitated by substantial funding from the DoE (Department of the Environment), then English Heritage. With the replacement of state-funding of rescue archaeology by developer-funding, firstly under PPG 16, briefly under PPS 5 and most recently under the National Planning Policy Framework (NPPF), the knowledge base has expanded but arguably there has been a stagnation or even decline in the standards of the investigation of food plant remains from individual development-led excavations in England.

PERIOD 1

Serious investigation of food plant remains from Romano-British towns began with Reid and Lyell at Silchester. Reid was recording the history of the British flora and Lyell sent him seeds recovered from the Society of Antiquaries excavations of the town (Reid 1899; Robinson 2012). Subsequently Reid (1901–9) identified a wide range of seeds of fruits and flavourings preserved by waterlogging showing a considerable Roman influence on the diet of the population of the town. They included fig, plum, cherry, mulberry, walnut, dill, fennel, coriander and celery (probably for consumption of its aromatic seeds). The results corresponded with preconceptions about Romanisation. Reid's work did not, however, cover staple cereals.

Reliable work on cereals from a Roman town in Britain did not occur until Helbaek (1952), following earlier work which included Roman Britain, investigated a mid-second-century deposit of carbonised grain at St Albans. It mostly comprised spelt wheat but there was also a presence of six-row hulled barley, bread-type wheat, rye and Celtic/horse bean. Evidence for the use of food plants in religion in Roman towns came with the discovery of carbonised cone fragments of a stone pine from a second-century pit in the Triangular Temple at St Albans (Wheeler and Wheeler 1936, 118–19). It was subsequently identified from a late second/third-century context at the London Mithraeum in the early 1950s (Grimes 1968, 114).

Surprisingly, despite the importance of the early discoveries being widely recognised and much quoted in works on Roman Britain, little effort was made to generate additional data even with the initial expansion of rescue excavation on Roman towns in the 1960s. However, another aspect of the food supply of Roman towns was revealed by the discovery of grain beetles including *Sitophilus granarius* (grain weevil) in a mid to late second-century waterlogged pit at Alcester (Osborne 1971).

PERIOD 2

The very rapid growth of rescue archaeology in the late 1970s facilitated the development and expansion of environmental archaeology. This growth of environmental archaeology was initially promoted by the newly-founded town and county archaeology units which relied on local authority and Department of the Environment funding. Subsequently the DoE/Historic Buildings and Monuments Commission for England (English Heritage) contributed major funds and set up regional environmental archaeology laboratories in universities.

The work of these laboratories included many archaeobotanical investigations on rescue excavations in Roman towns. Willcox (1977) showed that waterlogged remains of exotic food plants were not just to be found at Silchester. He identified seeds of many of the same fruits, nuts and flavourings from London along with cucumber, peach and olive. Evidence for the importation of grain to London from further south in Europe was given by a mid-second-century deposit of carbonised spelt wheat from the forum which also contained a slight presence of *Vicia ervilia* (bitter vetch) (Straker 1984). Spectacular remains were found from the Boudican burning of Colchester in A.D. 60–1. There was a cluster of carbonised dates from Lion Walk (Murphy 1984a), while the identification of remains from an earlier excavation of 'Currey's Pottery shop' showed its stock included seeds of coriander, dill, anise, celery and opium poppy (Murphy 1984b).

Probably the most detailed and thorough archaeobotanical work of this period was done by the Environmental Archaeology Unit of the University of York. The now familiar range of fruits and flavourings was found in wells of mid and late Roman date in York at Skeldergate (Hall *et al.* 1980) and the Bedern (Kenward *et al.* 1986), including fig, grape, plum, cherry, coriander, celery, dill and in addition seeds of *Satureja hortensis* (summer savoury). Charred food plant remains at York were limited to a few rich deposits of clean grain with very little chaff (Hall and Kenward 1990), whereas waterlogged cereal chaff was of widespread occurrence. Hall developed techniques of sampling; for example, demonstrating that bulk sieving of waterlogged deposits recovered some uncommon large items such as olive stones and pine nuts which were rarely if ever found in small samples analysed in the laboratory. Waterlogged cereal bran was found to be a typical component of human sewage, usually along with the broken remains of cereal weed seeds such as *Agrostemma githago* (corn cockle). Effort was made to identify small fragments of plant tissue on the basis of cell structure from those plant foods such as leeks where vegetative parts rather than fruits or seeds are consumed, although unfortunately this research was largely confined to Anglo-Scandinavian York.

One aspect of the urban food supply which was thoroughly investigated at York was insect infestation of stored grain. Exotic grain beetles were found in most waterlogged deposits where there were remains of food plants. However, exceptionally high concentrations of four species of grain beetle, including *Sitophilus granarius* and *Oryzaephilus surinamensis*, were found associated with a granary on the bank of the river Ouse near the fortress (Kenward and Williams 1979). The granary was demolished in the late first century.

By 1990 it was known that the staple cereals being consumed in towns were spelt wheat and six-row hulled barley. These were the main cereals of Iron Age Britain and remained the most important cereal crops throughout the Roman period. As soon as towns were founded, an élite became established within them who desired luxury plant foods that were familiar in the Mediterranean world. These foods were mostly horticultural crops including fruit, flavourings and possibly vegetables. Initially all would have had to have been imported but many were subsequently cultivated locally. Many of those foods which could be grown in Britain were also adopted on rural settlements and some were consumed on low-status sites (Booth *et al.* 2007).

PERIOD 3

The transition of funding for rescue archaeology from English Heritage to the private sector from 1990 onwards was a gradual process. English Heritage funding continued for ongoing projects and those with pre-existing planning consent. The Ancient Monuments Laboratory of English Heritage continued its funding of environmental archaeology within universities for some years, although their work became more advisory. The Environmental Archaeology Unit in the Department of Biology at the University of York survived in a depleted state until 2003. However, no more fascicules on the archaeobotany of York were published and the output of the Unit increasingly became unpublished assessment reports. English Heritage possibly hoped that additional commercially-funded archaeobotanists would work alongside the English Heritage-funded archaeobotanists in universities and that the posts it supported would gradually be transferred to commercial funding. Thus standards would be maintained. Some commercially-funded archaeobotanists did initially work in the English Heritage-funded laboratories but as the competitive tendering aspect of commercial archaeology became stronger, it mostly became impossible to keep them employed on a research assistant scale with the overheads required by the universities. There are, however, still some university departments which undertake commercial work including environmental archaeology. The local authority curators have continued to require that at least some archaeobotanical work be undertaken when suitable deposits are present as a condition of planning consent. Some of the larger archaeological units met this by appointing their own environmental archaeologists, although not all could provide adequate facilities. Other archaeological contractors relied on self-employed archaeobotanists working from home, likewise often lacking adequate facilities.

Over much of England the local authorities only required post-excavation archaeobotanical work to be taken to an assessment or evaluation stage. While flots of carbonised plant remains are compact and stable and so could be archived in museum stores along with the artefacts from an excavation, waterlogged samples are bulky and unstable so their potential would be lost if they were not fully analysed within a few years of excavation. Another problem inherent in developer-funded archaeology is that despite evaluations, the archaeobotanical potential of a site is not always apparent at the stage when projects are being costed. Analysis is particularly well funded on some sites because remains are sparse whereas funding is inadequate for other sites with very significant remains. There has not always been a strong research aim with developer-funded archaeobotanical analyses; for example, rather too much effort has been spent analysing waterlogged plant remains from poorly-dated riverside dumps in London. A review of archaeobotanical work in Roman Britain related to food plants showed that the number of samples analysed per excavation and the quality of data from investigations declined after 1990 (van der Veen *et al.* 2007).

Progress has, however, been made in several areas over the last 24 years, although not all of it has been on developer-funded excavations. One new line of evidence, macroscopic plant remains preserved by calcium phosphate mineralisation, has risen to prominence. Such remains are particularly characteristic of latrines and were first considered in detail from medieval contexts (Green 1979). However, Willcox (1977) noted the occurrence of such material from Roman London and Murphy (1992) reported a mineralised fig and other seeds in a latrine pit at the barracks of the Claudian fortress at Culver Street, Colchester. Subsequently, mineralised remains were reported from several Roman towns including Leicester (Monckton 1996), where an early Roman pit contained seeds of pea, lentil, grape and fig, and a late Roman pit at 5 Billiter Street, London, which contained mineralised seeds such as fig, apple and cherry (Davis and Giorgi in McKenzie and Symonds 2004). A very rich deposit was found in a second-century cesspit at Castle Street, Leicester, with seeds of grape, fig, strawberry, a small variety of plum and opium poppy (Score *et al.* 2010). The excavators interpreted the shop as a 'delicatessen'; if so, the proprietor seems to have been consuming some of the stock.

Probably the most detailed survey of mineralised plant remains was undertaken for mid and late Roman latrines at Silchester, a research excavation (Robinson 2006; 2011). The only cereal remains preserved were those which had been consumed as intact grains or spikelets but legumes,

particularly lentils, were well represented if difficult to identify. A wide range of seeds of fruit and flavourings was present. The late Roman latrine contained skin fragments of apple as well as apple seeds. Waterlogging of the lower part of a mid-Roman latrine, which contained mineralised remains above the level of waterlogging, showed a strong difference between what was preserved by the different means. The waterlogged seeds were mostly of blackberry whereas fig seeds were the most numerous fully-identified mineralised items. Interestingly the waterlogging also preserved pollen of Brassicaceae likely to have been from the consumption of *Brassica* florets (Dark 2011).

There has been further progress on the use of food plants in ritual. There have been more waterlogged finds of stone pine in London including cones and branches, the latter suggesting it was grown locally (Goodburn 1999). An important discovery was made from mid to late Roman cremation burials at the Eastern Cemetery in London (Davis 2000). Handfuls of lentils and in one instance peas had been thrown onto the funeral pyres.

Unsurprisingly, continuing excavation extended the range of rare exotic imports found in Roman towns. Black pepper, an import from across the Indian Ocean, was identified from Borough High Street, Southwark (van der Veen *et al.* 2008). Spectacular discoveries were made at 1 Poultry, London (Davis 2011). The Boudican destruction levels included a burnt shop which stocked imported pottery and spices. Carbonised *Nigella sativa* (black cumin) was added to the by now familiar range of flavourings such as dill, fennel, celery and coriander. Waterlogged remains of these species were also found in human faecal material in a drain along with stones of olive and almond. Bags of semi-cleaned grain of wheat and barley were charred in the burning. Carbonised seeds of lentil and, to a lesser extent, pea and Celtic/horse bean were found from throughout the phases of the site. Another exotic identified for the first time from Roman Britain was pomegranate.

With the scale of excavation which has now taken place in Roman towns it has become possible to trace the spread of insect pests of stored grain (Smith and Kenward 2011), which showed them to be of usual occurrence, suggesting relatively large-scale grain storage in towns. Another exotic pest of food, the oriental cockroach, was identified from late Roman Lincoln (Kenward pers. comm.).

Sufficient sites in Roman Britain had been subjected to archaeobotanical analysis by the mid-2000s for a detailed review to be made of the new food plants from them (van der Veen *et al.* 2008). The results included about 170 records (sites x major phases present) for towns. The early, middle and late Roman periods were all represented. Records of food plants regarded as being imported (fig, mulberry, grape, pine nut, olive and lentil) were mostly concentrated in the major towns and, to a lesser extent, on military sites. However, they tended to decline in frequency from the early to late Roman periods. (Although no late Roman records are given for lentil, it was recorded from late Roman contexts at London and Silchester as quoted above.) There is, however, a problem of interpretation as to whether some of these foods were always imported. From personal experience, all but figs with robust seeds (the type represented archaeologically) and olives can readily be grown in Southern England, with mulberries being particularly productive. Fresh mulberries are probably the hardest to transport because they are fragile and do not keep after picking. However, it would have been possible to dry mulberry fruit in a Mediterranean climate. There is evidence that grape was grown in Roman Britain (Brown *et al.* 2001), but if the fruit were consumed dry it is likely it would indeed have been imported from Southern Europe. Lentil is not now grown commercially in Britain but there have been occasional examples of its cultivation (e.g. Young 1813).

Results for the three most commonly found flavourings — coriander, celery seed and dill — were concentrated on major urban and military sites. However, all can be grown in Britain and are also present on rural sites at all status levels. Likewise cultivated apple/pear, cherry and plum/damson, although frequently encountered in urban contexts, were widely grown and used in the countryside. Reliable evidence for vegetables is limited since many of those listed by van der Veen *et al.* (2008) have non-cultivated ancestors which would have readily grown as weeds on settlements. Leaf beet and cultivated *Brassica* (cabbage etc.), which have coastal ancestors, were mostly recorded from towns. The survey noted some very rare exotic imported foods which were only known in Britain from one or two records from Roman London and were rare throughout

the North-West parts of the Empire: black pepper, peach, almond, pomegranate and black cumin. This was in contrast with the frequently imported exotics such as fig and even olive.

The study by van der Veen *et al.* (2008) showed a strong contrast between major towns, with a greater range of new foods, and minor towns. It also showed a decline over time of those fruits which were not being grown in Britain in contrast with those which could be grown locally such as plum, whose consumption apparently increased. The pattern shown by food flavourings is less clear. Van der Veen *et al.* (2008) believe that the cultivation of fruit, vegetables and flavourings was facilitated by a stratified society and the demand for them was particularly from the towns. They see the rise then decline in consumption of some of the 'new' foods as reflecting the rise then fall of groups within Britain favouring Roman ways of eating.

Given the details that were already known by 1990 about the food plants of Roman Britain, it is unsurprising that the scale of discoveries seen in the 15 years leading up to 1990 was not matched subsequently. However, important progress was made in relation to Roman towns. Firstly, legumes were shown to have had a much more important place in the urban diet than previously assumed. Secondly, the status of the various non-staple foods in towns is much better understood as a result of the survey of van der Veen *et al.* (2008).

EMERGING THEMES OF RESEARCH

There are several lines of research which are providing new insights into the plant component of diet in Roman towns. There are only a few towns with pre-Roman origins but at Silchester waterlogged seeds of celery and a stone of olive have been found stratified in a secure pre-Roman context (Lodwick 2014). Imported ceramic tableware and wine amphorae were also found at late Iron Age Silchester. This implies that there was an élite in the *oppidum* of Silchester which enjoyed luxury imports or a group with a Romanised identity. Silchester has also provided evidence for a continuation of a 'Roman' diet, with spelt wheat and fig seeds present in the latest contexts in which plant remains were preserved, rather than crops such as bread-type wheat which are more characteristic of Saxon settlements (Robinson 2006). At the extramural settlement of Alchester, carbonised spelt wheat was found in quantity and conditions to suggest it was not residual above a context containing Saxon pottery (Booth *et al.* 2007, 317). Possibly, in the chaotic conditions of the early fifth century, some towns had militia capable of repelling marauding bands of former agricultural slaves and Saxon opportunists, thus enabling a continuation of a Roman way of life, which included eating spelt wheat and enjoying very occasional treats of imported figs and North African wine, until town life ceased to be economically viable.

It has been noted that some foods would initially have been imported for consumption in the towns but would subsequently have been grown locally. For example, plum would initially have been as special as olive in early Roman towns but by the late Roman period was most likely to have been cultivated on a large scale in the countryside. It has proved possible to trace the spread of coriander at the town of Alchester (Booth *et al.* 2007). It was identified from the legionary fortress which dated to shortly after the Roman conquest and was found in the first-century town. By the end of the first century coriander was present in a roadside settlement outside the town and in the later Roman period it had become widespread on rural sites in the region. The first and possibly second records are likely to have been seeds imported from Southern Europe. The find from the roadside settlement perhaps represented local entrepreneurs growing the flavouring for more Romanised occupants of the town. Towns were probably supplied with horticultural produce grown in the surrounding countryside. One possible example of this was a rural settlement at Mount Farm, near the Oxfordshire town of Dorchester, where a large quantity of both carbonised and waterlogged seeds of celery was found (Robinson 1992).

The evidence for the grain supply of towns is enigmatic. Hall and Kenward (1990) mentioned that Rougier Street had only the second rich carbonised grain deposit to be found in York and that little carbonised chaff had been found. If all the mid and late Roman charred flots from Insula IX of Silchester were combined, they would contain less grain and chaff than from a single rich sample from a rural settlement of the same date (Robinson 2012). The paucity of rich deposits of charred grain and chaff tends to be a feature of Roman towns. However,

from personal experience, when there is waterlogged evidence there is often much evidence of cereal chaff, particularly glumes of spelt wheat in company with cereal bran. The archaeological evidence suggests that large-scale storage of grain occurred in towns. Spelt wheat, unlike bread wheat, is a hulled cereal in which the grains are tightly enclosed by the glumes as spikelets which hold one to three grains. The spikelets need parching and pounding to release the grain. The heating process often led to remains becoming charred either because they accidentally fell into the fire or because the waste was burnt. It is suggested that spelt grain was mostly brought to the towns for storage and use after it had been de-husked (removed from the spikelets). The few rich deposits of carbonised grain from towns would therefore represent grain in storage which had accidentally been burnt, whereas the charred remains on rural settlements usually represent burnt crop-processing waste. De-husked grain is more vulnerable to infestation by grain beetles than grain stored in spikelets, hence the preponderance of grain beetles in Roman towns. It is further suggested that the waterlogged cereal remains from towns represent products from the cleaning of de-husked grain including chaff and 'tailcorn' (smaller grains, separated along with weed seeds and some chaff from the 'prime grain') imported for use as animal fodder. This material does not enter the charred record because there is no need for it to come into contact with fire.

CONCLUSIONS

The past 24 years have been a time of broadening of the evidence for the plant component of diet in Romano-British towns. The survey of van der Veen *et al.* (2008) played an important part in the interpretation of food plants introduced by the Romans (or at least introduced shortly before the Roman conquest). However, standards have not risen and in some instances they have declined. The archaeobotany of 1 Poultry (London) was of exceptional importance and some significant results were presented (Davis 2011) but there were not the resources available to analyse the remains in the detail seen on the Anglo-Scandinavian site of Coppergate, York (Kenward and Hall 1995). At Coppergate a flexible approach to the scale of analysis meant that more contexts could be investigated without neglecting those samples worthy of full analysis. There was also the expertise available to investigate waterlogged vegetative remains.

The current circumstances enshrined in NPPF that developers should fund archaeobotany from commercially-driven excavations in Roman towns is by no means entirely satisfactory. It would be more effective if the total funding raised from all excavations were concentrated on fewer sites with analyses undertaken in more detail by fully-trained specialists in environmental archaeology laboratories. However, such radical proposals, with the implication of an 'archaeology tax' on developers, are unlikely to be adopted.

Local authority curators, supported by English Heritage, have an important role in maintaining standards by setting briefs, giving advice and approving work. They need to appreciate that only requiring work to be taken to assessment level does not leave the material available for later research unless samples are fully processed and, in the case of waterlogged material, the remains are stored under stable conditions (frozen or in alcohol). As with all aspects of developer-funded archaeology, effort ought to be made to ensure that results that are only presented in 'grey' literature (locally published reports that are not widely or formally distributed) are available to other archaeobotanists. English Heritage could make a valuable contribution by maintaining the Archaeobotany Computer Database (ABCD) (Tomlinson and Hall 1996).

There is a need to maintain skills in all aspects of archaeobotany. While research and teaching on carbonised plant remains occurs at many English universities, the identification of mineralised and waterlogged macroscopic plant remains is probably only taught at one or two institutions. Fortunately, English Heritage retains a full range of archaeobotanical skills at Fort Cumberland and does provide training. Greater consideration ought to be given to other archaeobotanical evidence, for example phytoliths and pollen, as sources of information on urban diet and there is potential to link studies of botanical remains with stable isotope studies of human bones.

Some of the recent archaeobotanical studies presented here show the value of research excavations as well as developer-funded work. Synthetic work is important in bringing together the results for

many sites. Several recent lines of research have already been presented. Research on foodways has become rather fashionable in archaeology and doubtless such research will continue in relation to Roman towns. A new topic for consideration is the degree to which some exotic foods were associated with high-ranking individuals from elsewhere in the Empire rather than the Romano-British élite. This could probably explain some of the differences between London and other large towns.

BIBLIOGRAPHY

Booth, P., Dodd, A., Robinson, M. and Smith, A. 2007: *The Thames Through Time, the Archaeology of the Gravel Terraces of the Upper and Middle Thames, the Early Historical Period: AD 1–1000*, Oxford Archaeology Thames Valley Landscapes Monograph 27, Oxford

Brown, A.G., Meadows, I., Turner, S.D. and Mattingly, D.J. 2001: 'Roman vineyards in Britain: stratigraphic and palynological data from Wollaston in the Nene Valley, England', *Antiquity* 75, 275–87

Dark, P. 2011: 'The pollen and trichurid ova from Pit 5251', in M. Fulford and A. Clarke, *Silchester: City in Transition. The Mid-Roman Occupation of Insula IX* c. *AD 125–250/300. A Report on Excavations Undertaken since 1997*, Britannia Monograph 25, London, 294–300

Davis, A. 2000: 'The plant remains (with D. de Moulins)', in H. Barber and D. Bowsher (eds), *The Eastern Cemetery of Roman London: Excavations 1983–1990*, MoLAS Monograph 4, London, 368–78

Davis, A. 2011: 'The plant remains', in J. Hill and P. Rowsome, *Roman London and the Walbrook Stream Crossing: Excavations at 1 Poultry and Vicinity*, MoLA Monograph 37, London, 559–63

Goodburn, D. 1999: 'The evidence for the introduction of the Mediterranean "stone pine" to Roman England', *News WARP* 25, 19–22

Green, F.J. 1979: 'Phosphate mineralisation of seeds from archaeological sites', *Journal of Archaeological Science* 6, 279–84

Grimes, W.F. 1968: *The Excavation of Roman and Medieval London*, London

Hall, A.R. and Kenward, H.K. 1990: *Environmental Evidence from the Colonia: General Accident and Rougier Street*, Archaeology of York 14/6, York

Hall, A.R., Kenward, H.K. and Williams, D. 1980: *Environmental Evidence from Roman Deposits in Skeldergate*, Archaeology of York 14/3, York

Helbaek, H. 1952: 'Early crops in Southern England', *Proceedings of the Prehistoric Society* 18, 194–23

Kenward, H.K. and Hall, A.R. 1995: *Biological Evidence from 16–22 Coppergate*, Archaeology of York 14/7, York

Kenward, H.K., Hall, A.R. and Jones, A.K.G. 1986: *Environmental Evidence from a Roman Well and Anglian Pits in the Legionary Fortress*, Archaeology of York 14/5, York

Kenward, H.K. and Williams, D. 1979: *Biological Evidence from the Roman Warehouses in Coney Street*, Archaeology of York 14/2, London

Lodwick, L. 2014: 'Condiments before Claudius: new plant foods at the late Iron Age Oppidum at Silchester, UK', *Vegetation History and Archaeobotany* 23, 543–9

McKenzie, M. with Symonds, R.P. 2004: 'Roman and later pits at 5 Billiter Street, City of London', *London Archaeologist* 10(7), 289–99

Monckton, A. 1996: 'Charred and mineralised plant macrofossils', in L. Cooper, 'A Roman cemetery in Newarke Street', *Transactions of the Leicestershire Archaeological and Historical Society* 70, 74–8

Murphy, P. 1984a: 'Carbonised fruits from Building 5', in P. Crummy, *Excavations at Lion Walk, Balkerne Lane and Middleborough, Colchester, Essex*, Colchester Archaeological Report 3, Colchester, 40

Murphy, P. 1984b: 'Environmental archaeology in East Anglia', in H.C.M. Keeley (ed.), *Environmental Archaeology: a Regional Review*, Directorate of Ancient Monuments and Historic Buildings Occasional Paper 6, London, 13–41

Murphy, P.L. 1992: 'Environmental studies: Culver Street', in P. Crummy, *Excavations at Culver Street, the Gilberd School, and other Sites in Colchester 1971–85*, Colchester Archaeological Report 6, Colchester, 273–87

Osborne, P.J. 1971: 'An insect fauna from the Roman site at Alcester, Warwickshire', *Britannia* 2, 156–65

Reid, C. 1899: *The Origin of the British Flora*, London

Reid, C. 1901–9: 'Notes on the plant remains of Roman Silchester', in W.H. St John Hope (with or without G.E. Fox), 'Excavations on the site of the Roman city at Silchester in 1900–8', *Archaeologia* 57(2)–61(2)

Robinson, M.A. 1992: 'Environmental archaeology of the river gravels: past achievements and future directions', in M. Fulford and E. Nichols (eds), *Developing Landscapes of Lowland Britain. The Archaeology of the British Gravels: a Review*, Society of Antiquaries Occasional Papers 14, London, 47–62

Robinson, M. 2006: 'The macroscopic plant remains', in M. Fulford, A. Clarke and H. Eckardt, *Life and Labour in Late Roman Silchester: Excavation in Insula IX since 1997*, Britannia Monograph 22, London, 206–18, 374–9

Robinson, M. 2011: 'The macroscopic plant and invertebrate remains from mid-Roman Silchester', in M. Fulford and A. Clarke, *Silchester: City in Transition. The Mid-Roman Occupation of Insula IX* c.*A.D. 125–250/300. A Report on Excavations Undertaken since 1997*, Britannia Monograph 25, London, 281–93, 485–96

Robinson, M. 2012: 'The place of Silchester in archaeobotany', in M. Fulford (ed.), *Silchester and the Study of Romano-British Urbanism*, Journal of Roman Archaeology Supplementary Series 90, Portsmouth RI, 213–26

Score, V., Browning, J., Johnson, E., Monckton, A. and Kipling, R. 2010: 'A Roman "delicatessen" at Castle Street, Leicester', *Transactions of the Leicestershire Archaeological and Historical Society* 84, 77–94

Smith, D. and Kenward, H. 2011: 'Roman grain pests in Britain: implication for grain supply and agricultural production', *Britannia* 42, 243–62

Straker, V. 1984: 'First and second century carbonised cereal grain from Roman London', in W. van Zeist and W.A. Casparie (eds), *Plants and Ancient Man*, Rotterdam, 323–9

Tomlinson, P. and Hall, A.R. 1996: 'A review of the archaeobotanical evidence for food plants from the British Isles: an example of the use of the Archaeobotanical Computer Database (ABCD)', *Internet Archaeology* 1 http://intarch.ac.uk/journal/issue1/tomlinson/toc.html

van der Veen, M., Livarda, A. and Hill, A. 2007: 'The archaeobotany of Roman Britain: current state and identification of research priorities', *Britannia* 38, 181–210

van der Veen, M., Livarda, A. and Hill, A. 2008: 'New food plants in Roman Britain — dispersal and social access', *Environmental Archaeology* 13, 11–36

Wheeler, R.E.M. and Wheeler, T.V. 1936: *Verulamium: a Belgic and two Roman Cities*, Society of Antiquaries of London Research Report 11, Oxford

Willcox, G.H. 1977: 'Exotic plants from Roman waterlogged sites in London', *Journal of Archaeological Science* 4, 269–82

Young, A. 1813: *General View of the Agriculture of Oxfordshire*, London