

EATING
AND
DRINKING
IN
ROMAN BRITAIN

H. E. M. COOL



CAMBRIDGE

This page intentionally left blank

EATING AND DRINKING IN ROMAN BRITAIN

What were the eating and drinking habits of the inhabitants of Britain during the Roman period? Drawing on evidence from a large number of archaeological excavations, this fascinating new study shows how varied these habits were in different regions and amongst different communities and challenges the idea that there was any one single way of being Roman or native. Integrating a range of archaeological sources, including pottery, metalwork and environmental evidence such as animal bone and seeds, this book illuminates eating and drinking choices, providing invaluable insights into how those communities regarded their world. The book contains sections on the nature of the different types of evidence used and how they can be analysed. It will be a useful guide to all archaeologists, and those who wish to learn about the strengths and weaknesses of these materials and how best to use them.

HILARY COOL is a professional archaeologist who, for the past ten years, has run her own business providing post-excavation services to the professional sector. She is also a director of Barbican Research Associates, a company specialising in writing up backlog sites. Her publications include *The Roman Cemetery at Brougham, Cumbria* (2004) and (with J. Price) *Roman Vessel Glass from Excavations at Colchester 1971–1985* (1995).

EATING AND DRINKING IN ROMAN BRITAIN

H. E. M. COOL



CAMBRIDGE
UNIVERSITY PRESS

cambridge university press
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo

Cambridge University Press
The Edinburgh Building, Cambridge cb2 2ru, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org

Information on this title: www.cambridge.org/9780521802765

© Cambridge University Press 2006

This publication is in copyright. Subject to statutory exception and to the provision of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press.

First published in print format 2006

isbn-13 978-0-511-25794-0 eBook (Adobe Reader)

isbn-10 0-511-25794-5 eBook (Adobe Reader)

isbn-13 978-0-521-80276-5 hardback

isbn-10 0-521-80276-8 hardback

isbn-13 978-0-521-00327-8 paperback

isbn-10 0-521-00327-X paperback

Cambridge University Press has no responsibility for the persistence or accuracy of urls for external or third-party internet websites referred to in this publication, and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

For Mike

who has patiently lived with me and the Romans for a very long time

Contents

<i>List of figures</i>	<i>page</i> ix
<i>List of tables</i>	xi
<i>Preface</i>	xiii
<i>Acknowledgements</i>	xv
1 Apéritif	I
2 The food itself	8
3 The packaging	15
4 The human remains	21
5 Written evidence	30
6 Kitchen and dining basics: techniques and utensils	37
7 The store cupboard	56
8 Staples	69
9 Meat	80
10 Dairy products	93
11 Poultry and eggs	98
12 Fish and shellfish	104
13 Game	111
14 Greengrocery	119
15 Drink	129
16 The end of independence	152
17 A brand-new province	172

18	Coming of age	200
19	A different world	221
20	Digestif	243
	<i>Appendix: Data sources for tables</i>	246
	<i>References</i>	253
	<i>Index</i>	275

Figures

1.1	Map showing the principal sites mentioned in the text.	<i>page</i> 4
1.2	Detailed insets 2 and 3 for fig. 1.1.	5
1.3	Detailed inset 4 for fig. 1.1.	6
3.1	Amphora forms and their main contents.	17
6.1	Early third-century 'north African' casseroles and cooking jars from York.	40
6.2	Tripod cooking bowls.	41
6.3	A selection of mortaria showing size ranges.	42
6.4	Boxplot showing the internal diameters of pottery mortaria and stone mortars by date.	44
6.5	Metal vessels used in sacrifice and bathing, with altar.	48
8.1	Beehive and lava querns.	72
9.1	Cattle scapula from Castleford.	90
10.1	Military cheese presses and strainers from Longthorpe and Holt.	96
15.1	Detail of the Simpelfeld sarcophagus showing the wine service.	137
15.2	Metal vessels used for hand washing and the wine service.	139
15.3	Strainers used for infused drinks.	145
15.4	Pottery beakers with drinking mottos from Verulamium and York.	148
15.5	Plot of the size of late second- to third-century pottery beakers.	149
15.6	Comparison of the sizes of first-, third- and fourth-century pottery beakers.	150
16.1	Pottery tablewares found in the King Harry Lane cemetery showing the range of sizes.	156
16.2	Sizes of beakers used as accessory vessels at the King Harry Lane cemetery compared to the size of motto beakers.	165

17.1	Colchester. Sites in the vicinity and location of the excavated sites within the fortress.	173
17.2	Leadenhall Court, London. Location of the site at the north-west of the later <i>forum basilica</i> and main excavation area.	181
17.3	Cremation Burial 25 at Stansted.	196
17.4	Burial 2 at Grange Road, Winchester.	197
18.1	The Uley temple complex.	212
18.2	The <i>mithraeum</i> at Carrawburgh.	214
19.1	Correspondence analysis plot showing the change of glass-vessel assemblage compositions with time.	225
19.2	Correspondence analysis plot showing the changes in pottery vessels available at York with time.	229
19.3	Correspondence analysis plot showing the changes in pottery-vessel assemblages at Wroxeter with time.	233
19.4	Fourth-century silver spoons used in both pagan and Christian worship.	241

Tables

3.1 Amphorae as a proportion of total pottery assemblages.	<i>page</i> 18
3.2 Size and capacities of some of the commoner amphora forms found on British sites.	19
4.1 Mean stature of adults in eight late Roman cemeteries.	25
4.2 Incidence of dental caries, enamel hypoplasia and cribra orbitalia.	26
4.3 The incidence of DISH in sexed individuals over the age of 45 at Poundbury.	28
6.1 Incidence of sooting, burning and limescale on different categories of pottery vessels.	38
6.2 A comparison of the functional categories in selected late second- to third-century samian assemblages.	46
7.1 A comparison of dated amphora assemblages.	60
7.2 The presence/absence of amphora types in dated assemblages.	61
7.3 The presence/absence of various spices in waterlogged deposits.	65
9.1 A comparison of later first- to mid-second-century animal bone assemblages.	81
9.2 The relationship between deadweight and meat yield.	81
11.1 A comparison of the recovery of different types of poultry at selected urban sites.	99
11.2 A comparison of sheep/pig and poultry bone fragments from Culver Street, Colchester and Fishbourne.	100
13.1 A comparison of sheep/pig and deer bones at selected sites.	112
14.1 The incidence of fruit remains in selected cesspits.	120
15.1 Wine sources at first-century forts.	133
15.2 Wine sources in London during the first century.	134
15.3 Incidence of metal vessels on different types of site.	140
16.1 Pottery forms from Braughing.	161

16.2 Pottery forms from Gorhambury.	161
16.3 Tableware forms in formal burials at the King Harry Lane cemetery.	162
16.4 Incidence of cups in the graves at King Harry Lane.	163
16.5 Associations of the principal types of tablewares at the King Harry Lane Cemetery.	167
17.1 Proportions of the principal domesticates at Colchester in contexts dated to AD 49–60/1.	174
17.2 Amphorae-borne commodities in Colchester AD 44–60/1.	175
17.3 Pottery-vessel forms from Colchester AD 44–60/1.	176
17.4 Glass-vessel forms from Colchester AD 44–60/1.	178
17.5 Pottery and glass vessels associated with Phase 3 contexts at Leadenhall Court, London.	182
17.6 Animal bone from the principal domesticates from selected Fort I contexts at Castleford.	186
17.7 Pottery vessels from Fort I contexts at Castleford.	188
17.8 Glass vessels from Fort I and the Phase 1 <i>vicus</i> area at Castleford.	188
17.9 Animal bone from the principal domesticates from Period 2 contexts at Claydon Pike and Period 1 contexts at Orton Hall Farm.	190
17.10 Pottery vessels from Period 2 contexts at Claydon Pike and Period 1 contexts at Orton Hall Farm.	192
17.11 The grave goods from the Bartlow burials.	194
18.1 Principal pottery and glass-vessel types from contexts of Phases 2, 3 and 5 at Causeway Lane, Leicester.	203
18.2 Principal pottery and glass-vessel types from Claydon Pike (Phase 3) and Parlington Hollins.	204
18.3 Animal bone from the principal domesticates from Period 3 contexts at Claydon Pike and Roman contexts at Parlington Hollins.	205
18.4 Animal bones from Phase 4 contexts at Uley.	213
18.5 The pyre good-meat-bone associations for burials at Brougham.	218
19.1 Glass-vessel assemblages of various dates quantified according to form.	224
19.2 The principal pottery vessel forms in use in Roman York.	228
19.3 Pottery from late Roman and sub-Roman contexts at the Baths Basilica, Wroxeter.	233

Preface

I decided to write this book as it combined three of my great interests in life – food, drink and Roman Britain. Whilst few people would be surprised at the first two, a passion for the third would raise eyebrows in many archaeological circles. For much of my professional life just as real men didn't eat quiche, so real archaeologists didn't do Roman Britain. For Classical archaeologists, the province of *Britannia* was a distant excrescence, far from the 'proper' archaeology of the Mediterranean lands. Within British archaeology, it was seen as the preserve of arcane specialisms pursuing their own agendas far from where the theoretical action was. Whilst theory has now come to Roman Britain, it is still an uncomfortable place for many. Modern tastes wish to do away with anything that recalls colonialism, whilst rising nationalisms prefer not to engage with periods when Britain was self-evidently part of a wider world. Prehistory is still a safer, more comfortable and purer world for archaeologists to play in.

This is a great pity as Roman Britain is a very strange place, much stranger than the many popular books written about it would lead one to think. It is fully worthy of being studied in its own right, but that has to be done on its own terms. This involves knowing how to interpret all the data relating to it. The problem with Roman Britain is that there are just too many things. Too much pottery, too much metalwork, too many animal bones. People tend to be overwhelmed by the sheer volume. They deal with it by picking out the occasional morsel, and hoping the rest will go away. This book is offered as a kind of hitchhiker's guide to those who would like to explore this material, but who lose the will to live when faced with the reams of specialist reports that even a minor excavation can generate. It shows, I hope, how these reports can be used to explore different facets of the past. I have chosen to explore eating and drinking

because not only does it interest me but, as the celebrated gourmet and bon viveur Brillat-Savarin said ‘Tell me what you eat, and I will tell you what you are’. Where better to start exploring Roman Britain?

Bon appetit!

Acknowledgements

A book like this depends on the work of the specialists who have sorted, identified, analysed and published the multitude of items on which it is based. Their names are mentioned in the footnotes, but I would like to put on record my thanks here, and my apologies too if I have misrepresented them.

Over the years I have benefited from discussions with many people. Those who have kindly answered questions specifically to do with this book include Richard Brewer, Peter Davenport, Brenda Dickinson, Jerry Evans, Andrew (Bone) Jones, Ruth Leary, Scott Martin, Quita Mould, Stephanie Ratkái, Paul Sealey and Vivien Swan. Special thanks are due to Ruth and Scott, who made the results of currently unpublished work available to me; and to Bone for reading the sections pertaining to fish. Jerry has been particularly generous with unpublished work and useful discussion. I'm sure he won't agree with what I've made of it all, but I hope he'll enjoy the result. Alex Smith and Oxford Archaeology kindly allowed me to refer to the results of the Claydon Pike excavations in advance of full publication and provided additional details.

Jaye Pont is thanked for her invaluable guidance in matters pertaining to illustration software, and I am grateful to the West Yorkshire Archaeological Service (via Chris Philo) and the Winchester Excavation Committee (via Professor Martin Biddle) for providing figs. 9.1 and 17.4.

I would like to thank Cambridge University Press for publishing the book, and the two editors who have overseen it, Jessica Kuper and Simon Whitmore. Simon is owed special thanks for his forbearance over its much delayed appearance. I am most grateful also to Sarah Parker, Joanna Breeze and Gwynneth Drabble for their work in preparing the book for publication.

Mike Baxter provided fig. 15.1 and read the final draft which was much improved by his comments. He has also provided constant encouragement and support during the book's prolonged gestation, and indeed for much longer than that. So, as is only right, this book is for him.

The final stages of preparing the manuscript have been enlivened by listening to the Test Match Special commentary of the thrilling 2005 England – Australia Ashes series. It has been most distracting – many thanks to the players of both teams and the commentators.

CHAPTER I

Apéritif

This is a book that takes that most common question ‘What shall we have for dinner?’ and uses it to explore the communities that lived in Britain during the first half of the first millennium AD (a period that will hereafter be called Roman Britain as a convenient shorthand). Subject-matter such as this has not always been thought very respectable. Certainly it has not been considered central to the story of Roman Britain. Yet in many ways there is no better way of understanding past societies. Eating and drinking are frequently about much more than sustaining life by the ingestion of sufficient calories. What you can and cannot eat, who you can and cannot eat it with, tends not to be so much a matter of personal choice, as the result of social conditioning. By studying the eating patterns of a society, you enter areas far beyond the mere nutritional. Eating and drinking rituals will quite frequently take you into the realms of religious beliefs, class, gender relationships, and ethnicity. Or, as Brillat-Savarin said more succinctly, ‘Tell me what you eat, and I will tell you what you are’.¹

The information that can be used for this study is entirely dependent on archaeological exploration. The scanty ancient sources that have traditionally underpinned the study of Roman Britain are virtually silent on the topic; and, when they do say anything relevant, can generally be shown to be unreliable witnesses. Archaeology, by contrast, produces data in almost embarrassing abundance. We have so much information that the problem is how best to use it, not just to explore eating habits, but also any other topic of interest. Most of these data are in the specialist contributions analysing and cataloguing the things found during excavation. These lurk behind the structural narratives of excavation reports like the submerged part of an iceberg, and are a seriously underused

¹ Brillat-Savarin 1826, 4th aphorism.

resource. I do not consider it an overstatement to say that they are where Roman Britain resides though, being a specialist myself, it might be considered that I am prejudiced. The patterns seen in the artefact and environmental reports often cut across preconceived notions of how life was lived in Britain during the earlier first millennium AD. It is my aim to bring this information to wider attention and, in doing so, demonstrate how it can be used.

If the specialist reports are so important, why are they so underused? The answer lies in the fact that this knowledge base developed as a service industry providing excavators with the information they needed to understand the structural narrative. It was generally very highly focused towards the provision of dating evidence because of the way Romano-British studies developed. There is a long history of studying the province stretching back to the antiquaries of the eighteenth century such as Stukely and Horsley. For many years the preferred approach was to use the archaeology as an illustration of the meagre historical record derived from the ancient sources. The role of the army, and the changing military dispositions, took centre stage. For this the overwhelming need was to be able to date sites, and to identify the different periods when particular forts were occupied. This led to a hierarchy of esteem with the finds that were either intrinsically dateable, or which could be dated, valued over those perceived as not providing this information. So, much attention was devoted to coins and inscriptions, which often come with their dates written on them. Dated typologies of pottery could be built up using the stratigraphic associations with these independently dated items, and the pottery could be used to date contexts without coins or inscriptions.

Over the past two or three decades, attention has shifted much more towards how provincial society developed. Ways of looking at the province have been much influenced by broader, theoretical approaches of the type loosely described as post-processual. Though these approaches look at much wider issues than the previous military – historical approach, what is still wanted by excavators is the dating that can be provided by the finds, and such information about the trade and exchange networks of the site as the material can provide.

The specialists who produce the reports naturally structure their work to the requirements of their ‘client’, the person writing up the excavations. The end result of this can easily be seen by glancing at most pottery reports. There will frequently be detailed considerations of the decorated and stamped samian sherds and the stamped mortaria, as these are perceived as best being able to give the types of dates needed. The rest

of the pottery will often be dealt with in a more summary way. The most favoured route currently is to prepare fabric and vessel type series, then quantify and summarise the assemblage according to these criteria, as this will help to provide information about the trade and exchange networks.

Increasingly whilst providing this basic, but ultimately rather boring, information, wider aspects of what the data are telling us are buried in the better specialist reports. This has been going on for some time but much of the wider archaeological community seems unaware of it. This is probably because few people read excavation reports from cover to cover. They will gut them for such information that is directly relevant to what they are working on, and hope that the author of the excavation monograph will have extracted the 'best bits' of the specialist reports for the overview. In my experience of writing and publishing specialist reports for over a quarter of a century, this is a misguided hope. It is a rare report that explores the interactions between all aspects of the data. It is the aim of this book to explore such interactions to show what a richly textured picture of the past comes about when this is done.

It has to be admitted that the picture is still a very patchy one. In part this comes about because some areas and types of site have seen relatively little work. Until the advent of developer-funded archaeology, for example, rural sites other than villas were seriously neglected.² Some of the gaps result from inadequate specialist reporting. This can come about for various reasons. Sometimes it is because work on the specialist categories is seen as an optional extra. Funds are not invested in various categories, or it is decided not to report fully on the material. Sometimes they are inadequate because certain conventions of reporting have arisen. In some areas the reports appear to be written mainly for the handful of fellow specialists who work in the field, blithely ignoring the fact that the ultimate aim must be to enable the integration of their information with all the rest of the data from the site. It is hoped that excavators and specialists reading this book will come to appreciate the gains that result from a full integration of all the material, and will perhaps mend their ways if necessary.

This book can be regarded as being structured in three parts. The next four chapters introduce the sources of the evidence. The first three of these are strictly archaeological and look at the food itself, the packaging it came in, and the results of ingesting the food as demonstrated by skeletal

² Hingley 2000, 150–1, Table 10.3; James 2003, 5–6, Illus. 1.

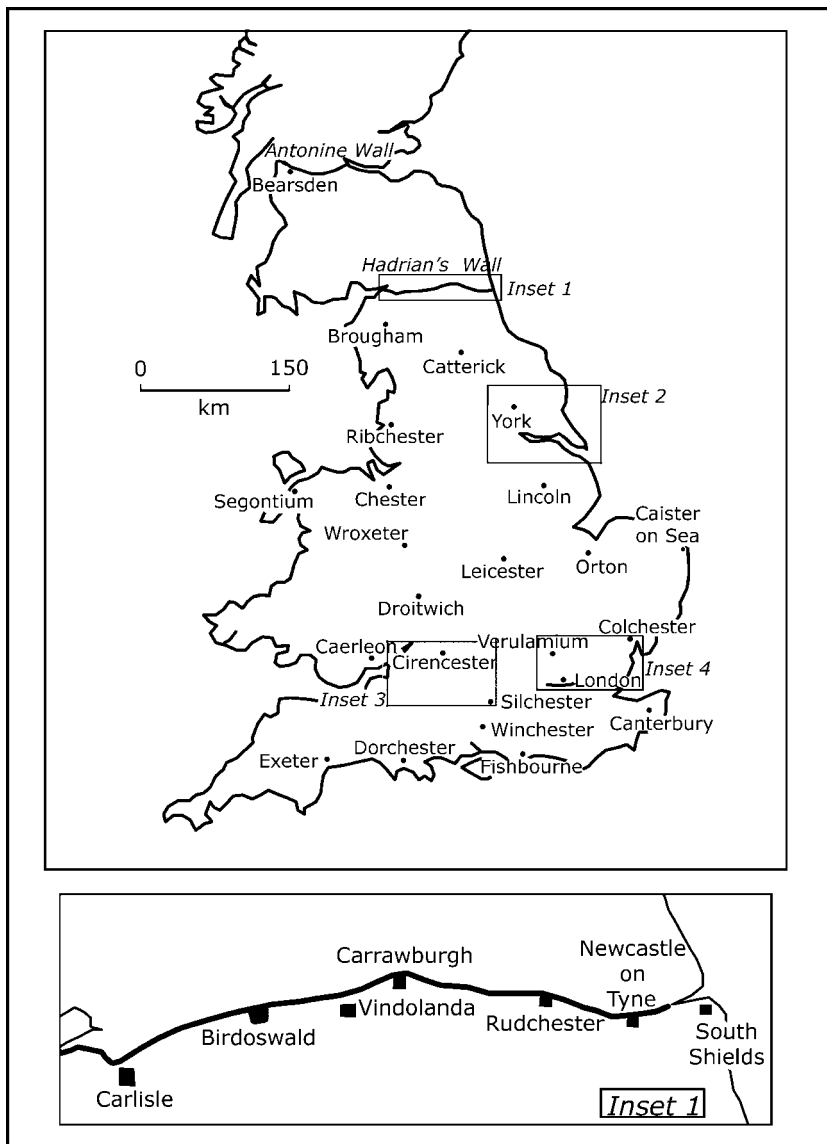


Figure 1.1. Map showing the principal sites mentioned in the text.

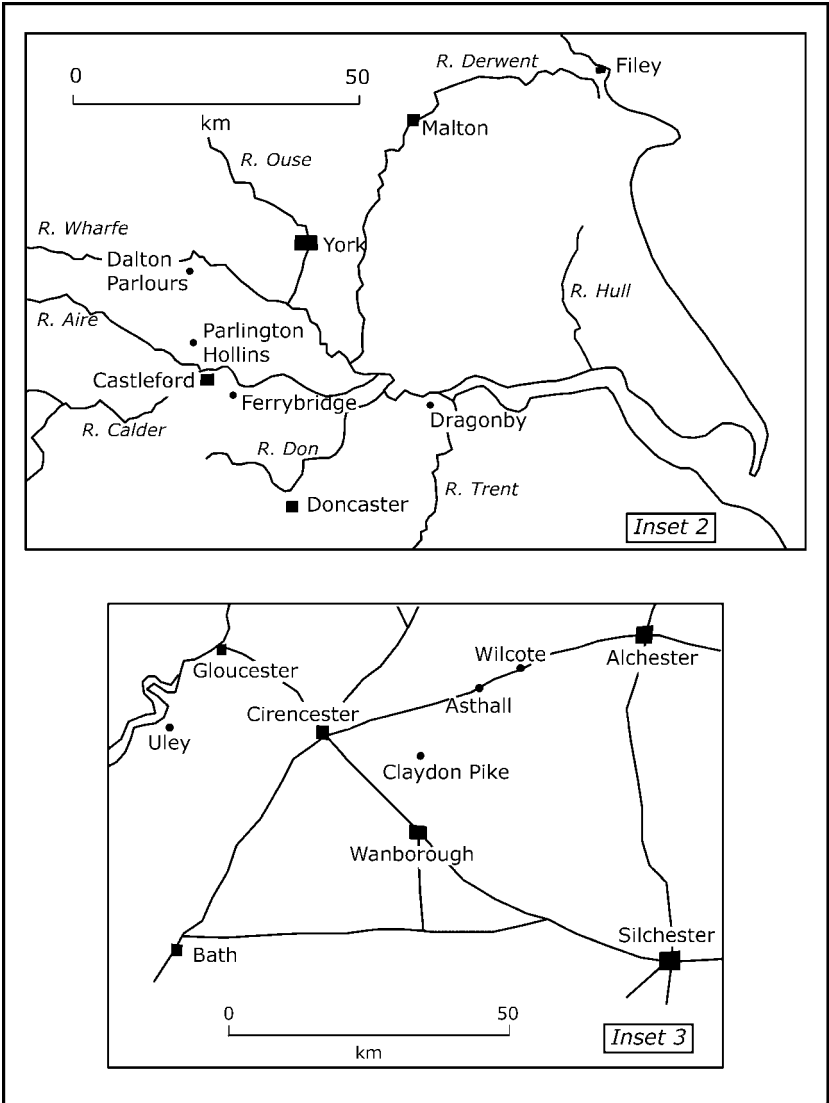


Figure 1.2. Detailed insets 2 and 3 for fig. 1.1. Inset 2 shows principal rivers in the area and inset 3 the main Roman roads.

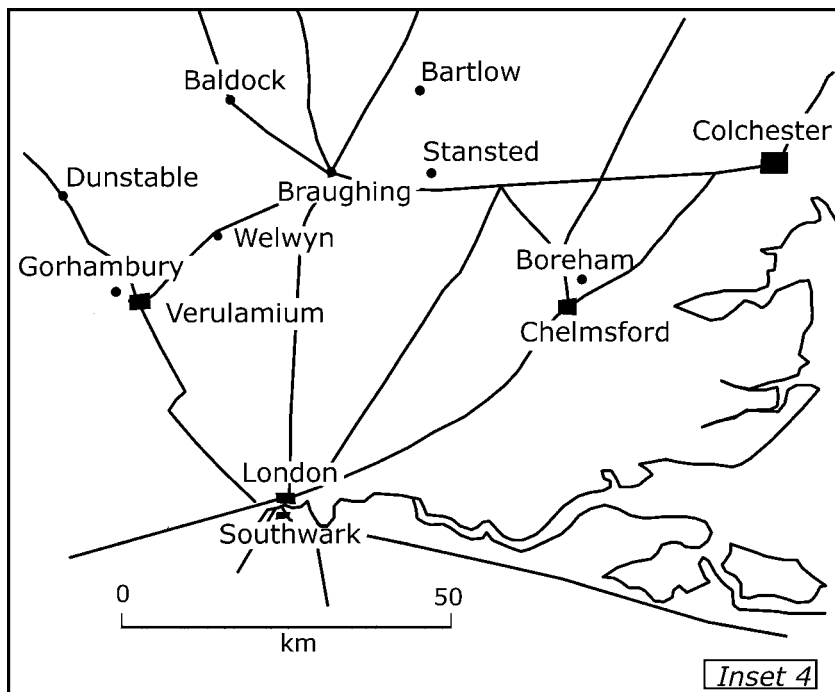


Figure 1.3. Detailed inset 4 for fig. 1.1 showing the main Roman roads.

remains. The biases inherent in these sources will be examined, and the ways in which the different types of finds are generally studied will be discussed. This first part concludes with a consideration of the written evidence (Chapter 5). Some of this is archaeological and directly relevant to Roman Britain, such as the accounts and shopping lists recovered from Vindolanda. Most of the ancient literary sources are not directly relevant to the province as they relate to the Mediterranean world, a very different social milieu. It is useful to look at them because they do provide a background to the lifestyles of at least some of the elite population in the province.

The second and third parts look at the data in two different ways. Chapters 6 to 15 look at general patterns seen in the ingredients available and favoured, and cooking techniques. It starts with basic information about the kitchen and utensils, and moves through the major food categories to finish with drink. This section takes as its model classic

works in the culinary repertoire that explore the cuisine of particular parts of the world such as Elizabeth David's *French Provincial Cookery*, Marcella Hazan's *Essentials of Classic Italian Cooking* and Rosemary Brissenden's *South East Asian Food*. This section exploits data from a wide variety of sites. In the third section (Chapters 16–19) the focus shifts to particular sites at particular times to explore the tastes of different communities. These case studies demonstrate how different strands of information can be combined to show how life was changing.

The chronological scope of the book ranges from the late pre-Roman Iron Age, when the influence of Rome was being felt in the south-east, until the fifth century when a new social environment was developing. The geographical range is that part of Britain that had extended periods within the Roman province, i.e. the mainland to approximately the Antonine Wall on the Forth – Clyde isthmus.

Finally, a few words about conventions used are appropriate. The term 'finds' will be used as a convenient shorthand to represent both artefactual and ecofactual material. The book is heavily dependent on a very large number of specialist reports, but to keep the references within publishable bounds the full details of each one cannot be given. In the footnotes the convention has been adopted of citing the specialist by name and the editor or author of the monograph; thus 'Mould in Wilson 2002a'. In the references the details of the publication will be found under Wilson 2002a. The sources used for each table will be found in Appendix 1, and the locations of the main sites mentioned in the text are shown in figs. 1.1–1.3.

CHAPTER 2

The food itself

INTRODUCTION

The main direct sources of information about food come from animal bones and plant seeds. The types of meat and varieties of vegetables and fruit consumed will be considered later in the book. Here the various factors that govern the type of information that can be extracted from this material, and the biases that are inherent in its study, will be discussed. The opportunity will also be taken to consider the question of quantification. Knowing how much of a commodity has been found at a site is essential if comparisons of consumption patterns on different sites are to be made. Finally in this chapter, the nature of rubbish disposal will be considered.

ANIMAL BONES

The biases that affect animal bone assemblages can be divided into two broad categories relating to what can actually survive, and how what survives is excavated and subsequently studied.

What survives depends very much on the soil conditions in which the material was deposited. Bone does not survive well in acidic soils, and in extreme cases can disappear in its entirety.¹ The acidity of a soil is measured on the pH scale from 1 (extremely acid) to 14 (extremely alkaline), and below a value of 6 the mineral that makes up bone becomes extremely soluble. Soil acidity can vary greatly over small areas depending on husbandry, drift geology, and whether or not deposits are waterlogged. This is well demonstrated at Catterick where extensive excavations in and around the Roman town have produced conditions ranging from very good to so bad that no bone was recovered.² Even within a site there may

¹ Mays 1998: 17.

² Stallibrass in Wilson 2002b: 392.

be differential survival according to what type of feature the bones are deposited in. On a site with otherwise good preservation, it was possible to show that sheep and pig bones survived far better in pits than they did in ditch fills,³ probably because they were not being exposed to the elements and to scavenging animals. Dogs can have a noticeable impact on a bone assemblage when they ingest the more succulent bones.⁴ It is also suspected that the bones of different species may decay at differential rates,⁵ though in the words of one eminent specialist 'the decay of buried bone is complex, and still not well understood'.⁶ With all of these factors to keep in mind, it is not surprising that most animal bone reports devote some time to assessing the site formation processes that may have influenced the assemblage that survives.

One of the most important developments in archaeological methodology over the past quarter century has been the routine sieving of samples of deposits. The sample is generally disaggregated in water, and then passed through a series of sieves of increasingly fine mesh size. Such a process is vital if plant remains of the type discussed in [the next section](#) are to be recovered, and it is also very important for the study of animal bone. It has long been appreciated that hand collection on site results in a very biased assemblage favouring large fragments, often from large animals. To evaluate fish and bird consumption large-scale sieving is vital,⁷ but it can also be important for some other types of meat. The consumption of suckling pig can only be evaluated if sites have been sieved, as the bones of this delicacy are rarely recovered by hand collection.⁸

As will be obvious from this, comparing assemblages from different sites to build up a picture of who was eating what and at what time, has to be done with some care. There would be little useful information gained if the assemblage from a site with good preservation that had been sieved was compared with one where only hand collection had been carried out, even if the preservation was equally good. An additional problem arises with quantification, because assemblages can only be directly compared if they have been counted in the same way.

Counting things that are habitually found in a broken state, like animal bone and pottery, is not simple. Counting fragments is unsatisfactory as the same amount of bone may end up being found in different numbers of fragments on two sites depending on butchery practice and

³ Maltby 1981: 165 Table 2.

⁴ O'Connor 2000: 22.

⁵ King 1978: 210.

⁶ O'Connor 2000: 25.

⁷ Coy 1989: Table 2.

⁸ O'Connor 1989: 17.

site formation processes. As a very simple example we can imagine a long bone from a steer. On site A this is removed during butchery as an intact bone and disposed of in a pit where it remains undisturbed until excavated. On site B a similar bone may be chopped into six pieces to remove the marrow and the pieces then thrown into a ditch. One of these may be removed by a dog and be further fragmented into four pieces by a combination of chewing and people walking on the fragments where the dog leaves them. In total there are ten fragments of this bone from site B. Simple fragment count would indicate that there was ten times the amount of bone on site B as on site A, but of course this would not be true.

Even though these problems have long been recognised, a considerable amount of fragment-count data exists in the animal bone literature. The commonly used Number of Identified Specimens (NISP) measure falls into this category. This has the added problem that the number of bones is not identical in all animals. Pigs have more teeth and toes than cattle, whilst goats can only be identified from a limited number of elements.⁹

To overcome this a variety of counting strategies have been devised by animal bone specialists.¹⁰ One method is to calculate the minimum number of individuals represented; but any calculation of minimum numbers, be it for animal bone, pottery or any other category of find, is only useful for comparing the numbers of things of different sorts in a single assemblage. Minimum numbers have been shown to be very dependent on the size of an assemblage,¹¹ and so are not a useful measure when comparing different assemblages with each other.

A more useful measure is to count different elements of the skeleton based on identifying different diagnostic zones. This has the advantage that it not only allows comparison between assemblages, but also allows the investigation of what sort of consumption was going on at different sites. As a simple example, a site where the assemblage is dominated by bones from the heads and feet of cattle is likely to be an abattoir, as these are the elements often removed with the hide after the animal is slaughtered. The value of this method of quantification was shown in a study that incorporated a large number of animal bone assemblages from London. It was possible to show a pattern that could be interpreted as slaughter and hide removal taking place in the countryside, then transfer of the carcasses to primary butchery sites within the city. At those the

⁹ See O'Connor 2001: 54–7.

¹⁰ O'Connor 2001: 57–67.

¹¹ Orton 1993.

removal and disposal of the vertebrae could be observed as the carcass was butchered into joints. Finally, another set of sites could be identified which were associated with a high proportion of bones relating to prime meat joints, presumably the waste from the kitchens where they were consumed.¹²

The number of assemblages quantified by the zonal method is, alas, limited; and this book makes use of many assemblages quantified in far from ideal ways. The method of quantification will be stated, and the various drawbacks should always be borne in mind.

PLANT REMAINS

Most archaeological sites in Britain other than those with very acidic soil will produce debris from meat consumption in the form of bones. The recovery of the vegetable part of the diet tends to be much more erratic. Plant remains are generally recovered only if they have been deposited in a damp or waterlogged environment, if they have been burnt, or if they have been mineralised. Again, this is a source of evidence that is only recovered when systematic sampling and flotation is undertaken.

In waterlogged deposits the normal processes of decay are arrested because of the lack of oxygen. What tends to be preserved are the seeds, pips and stones. Whether a site produces any evidence like this clearly depends on the depositional circumstances. Mineralised remains are also reliant on the type of context, as mineralisation takes place when organic parts of seeds and stones are replaced by calcium phosphate through exposure to urine and lime.¹³ Latrine pits are ideal sources for such remains.

Plant remains preserved by burning tend to be more widespread, as once burnt they are not subject to decay and can be recovered from most soil types. The level of burning has to be relatively gentle as otherwise they will be burnt to ash. Burnt plant remains relating to diet are normally in the form of seeds, as various processes involved in preparing them for consumption require the application of heat. Not all cereals result in clean grain when threshed. The glume wheats (emmer and spelt) break into separate spikelets where the grains are still enclosed and have to be released from the glume. This is generally done by parching (heating) and pounding the grain.¹⁴ Malting grain to make beer also requires heat to

¹² Moreno Garcia *et al.* 1996; Orton 1996.

¹³ Greig 1982: 49.

¹⁴ Hillmann 1981.

be applied. Here the grain has to be germinated so that the proteins it contains are converted to enzymes, which in turn convert the starch into soluble sugars which can be fermented to produce beer. Germination has to be halted at a point that optimises the amount of enzyme in the grain, and this is done by the application of a gentle heat.¹⁵

As large quantities of grain will have been heated for cleaning and malting purposes, charred plant remains tend to be biased towards cereals, but other food stuffs can also be preserved as chance contaminants. The residues from cleaning crops (straw, chaff and weeds) were often regarded as a useful fuel, and some carbonised deposits found in kilns and corn driers are clearly fuel rather than accurately reflecting the quality of a processed crop.¹⁶

Various other events can lead to the preservation of foodstuffs by charring. Sometimes food stores are burnt down and, though the overall temperature of the fire would be sufficient to reduce most of the contents to ash, some material may well be merely charred if it was covered by ash at an early stage. This would have prevented oxygen reaching it and thus complete combustion. This is what clearly occurred at several venues at Colchester when it was destroyed during the Boudican rising in AD 60/1. Here fruit has been recorded, as well as fully processed grain.¹⁷ Foodstuffs were also placed on funeral pyres and again, though much would have been fully consumed by the fire, some will survive as charred remains.¹⁸ A particularly good example of this was associated with a burial in Southwark where dates, figs and almonds had been amongst the pyre goods, as well as barley and wheat.¹⁹

The types of food crop being grown can be investigated by using pollen analysis, though in general this is not as useful a resource as might be hoped. Typical analysed sequences tend to come from bogs, and are often far from cultivation sites. As the pollen of some species such as cereals does not travel over any great distance such sequences, though ideal for mapping general vegetation change through time, are of limited use for exploring the food crops produced.²⁰ In some circumstances, pollen analysis of samples gathered on archaeological sites can be of great value. It was from the pollen found in bedding trenches at Wollaston that it was possible to show that they had been used for vines, and to demonstrate conclusively for the first time that vineyards had been present in Roman

¹⁵ Protz 1995: 10–11.

¹⁶ van der Veen 1991: 305.

¹⁷ Murphy in Crummy 1984: 40 and 108.

¹⁸ Bouby and Marinval 2004: 77–8.

¹⁹ Mackinder 2000: 12.

²⁰ Huntley 2000: 68.