More buildings facing the Palace at Fishbourne

by John Manley & David Rudkin

This is the final report documenting the results of the recent excavations by the Sussex Archaeological Society in front of the Roman Palace at Fishbourne, near Chichester. This report deals with Area C, excavated in 2002. One of the principal discoveries, the pre-AD 43 ditch, has been reported elsewhere (Manley & Rudkin 2005b). This report concentrates on the post-AD 43 features and finds, of which the structural highlights are the partial remains of two further buildings, one constructed in timber, the other with flint foundations. These two buildings, together with the two revealed previously, suggest that in this area there was a complicated series of developments pre- and post-Palace. There is an extensive digital archive to this report on the Archaeology Data Service website.

INTRODUCTION

This is the last report which documents the excavations by the Sussex Archaeological Society in front of the Palace at Fishbourne between 1995 and 2002. The 1995–99 excavations were published in full in *Facing the Palace* (Manley & Rudkin 2005a), and the contents and significance of the pre-conquest ditch were reported in Manley and Rudkin (2005b). This report deals with the 2002 excavation known as Area C, which lies to the north of Area A, and incorporates the small trench known as Area B (Figs 1 & 2). Since the pre-conquest ditch, which traversed both Areas B and C from east to west, has already been reported in full, it will largely be excluded from the remarks presented here. The combined area of A and B measured some 15 m north–south, by 16 m east–west, a total of some 240 sq. m.

The aim of our excavation in 2002 was to locate more of the pre-conquest ditch and retrieve from it a much bigger sample of finds (Fig 3; photo) to allow a precise and more confident dating. This aim was successfully achieved. A secondary aim of the excavation was to try and locate the presumed northern end or northern side of the putative walled compound surrounding Building 3. This was not located, and if it exists, must be discovered in the yet unexamined area to the south between Area A and Area C.[1] It was, of course, our intention to excavate to the south and 'join up' Areas A and C. However, wiser but not older heads at English Heritage prevailed on us to abandon our intentions, stand back and take a longer look at the research potential of the whole area. We are indeed now standing back and producing a Fishbourne and Chichester Research and Conservation Framework, kindly sponsored by English Heritage.

Despite our failure to find the compound wall around Building 3, Area C managed to surprise us yet again with its wealth of archaeological features and finds. Amongst the plethora of features two stood out: the timber building with its clay floor to the north of the pre-conquest ditch, and the masonry foundations of yet another structure, Building 4, in the south-east corner of the excavation. Such discoveries lent credence to our claim in *Facing the Palace* that, at least in this area, no semi-formal gardens existed and provided us with an obvious, if unimaginative, title for this current report.

Readers familiar with *Facing the Palace* will be aware of the excavation methodology adopted and recognise the format of this report. The actual methodology of the excavation remained the same, save for the fact that the upper layers over most of the site were excavated in 5 m by 5 m units, giving separate context numbers to each unit. A great deal of supplementary text, line drawings and photographs can be found on the ADS website. Where such material exists it will be flagged by the symbols given at the end of this Introduction. This report can be read in published form in its entirety and will, hopefully, make 'sense'. However, the ADS material is not meant to be read in isolation from this published report. The excavation data base on the ADS website is again the data base compiled at the time of the excavation and no

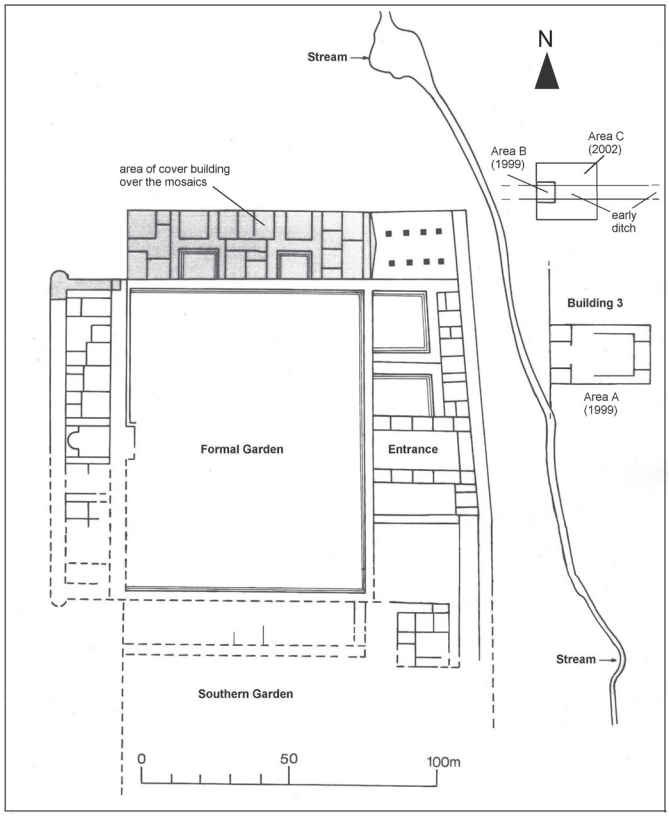

Fig. 1. Plan of Fishbourne Roman Palace and the locations of the 1995–99 and 2002 excavations, indicating Areas A, B and C.

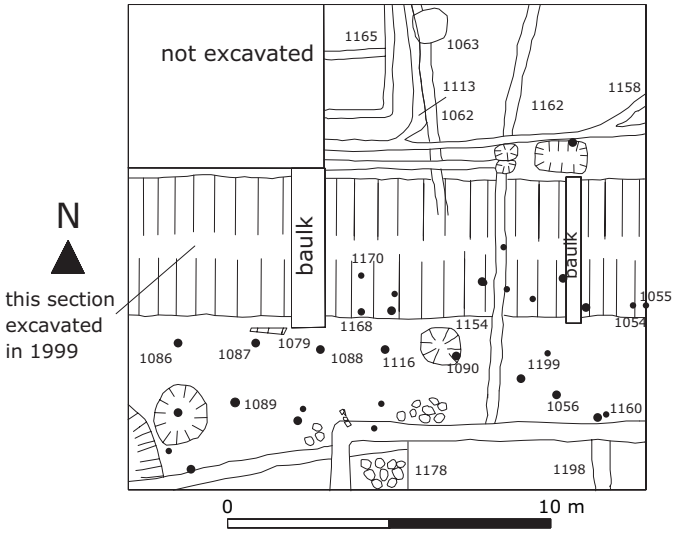

Fig. 2. Plan of 2002 excavation showing most of the significant features.

attempt has been made to incorporate later information, for instance on finds identified more accurately by the finds specialists during the post-excavation process. Nor has any attempt been made to integrate the finds from Area B with those from contiguous Area C; researchers needing an integrated picture will need to look at all three published reports. As in *Facing the Palace,* where there are references to Area B, they are shaded as in this sentence.

The reader will note that the stratigraphy has allowed a division of the archaeology of Area C into several chronological phases. At the start of each major phase reference is made to what else was happening in the landscape of Fishbourne at approximately the same time.

📖 - This symbol indicates that there is supplementary text on the ADS website.

■ - This symbol indicates that there are supplementary images on the ADS website.

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PART 1 — THE EXCAVATIONS

PHASE CC: AD 43 TO LATER FIRST CENTURY AD

This phase at Fishbourne witnessed a variety of activity. Elsewhere on the site timber buildings of a putative Roman military character were being erected on the site later occupied by the Flavian Palace. South of Area C construction work was beginning on Building 3, which probably stood within its own walled compound. In Area B the top of the pre-conquest ditch was filled with some rubbish that included early post-conquest ceramics.

In Area C itself, the archaeology could be divided into three sub-phases: CC1; CC2 and the latest CC3, on the basis of intercutting shallow drainage gullies.

Fig. 3. Pre-conquest ditch being excavated — from the east (for more details *see* Manley & Rudkin 2005b).

CC1

Two shallow gullies (1062, 1162) drained southwards, the eastern one being cut through the backfilled pre-conquest ditch. The gullies were generally vertically-sided with flat bottoms, varying from 120 mm to 400 mm deep, and with sandy-clay fills. In addition, there were a series of post-holes (Figs 4, 5, 6, 7 & 8) in broadly two east–west alignments, one running over the top of the pre-conquest ditch, the other to the south of the ditch. No discernible

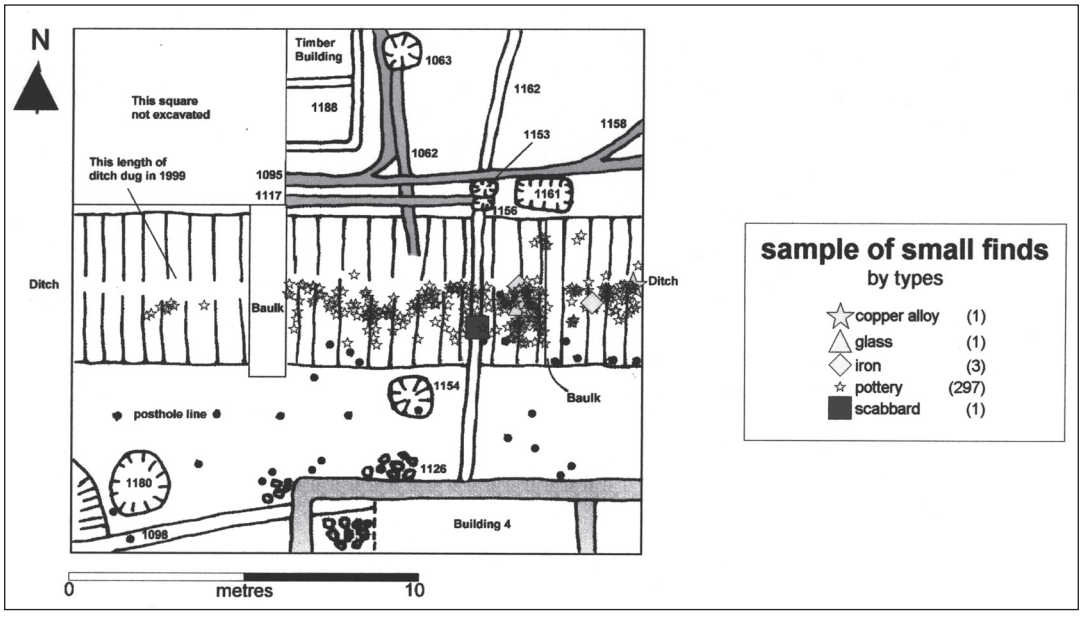

Fig. 4. Distribution of small finds in the pre-conquest ditch (for more details *see* Manley & Rudkin 2005b).

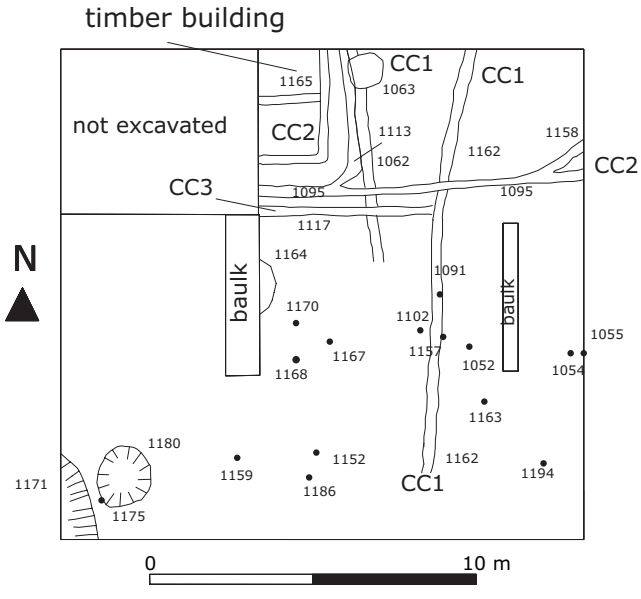

Fig. 5. All the features of Phase CC.

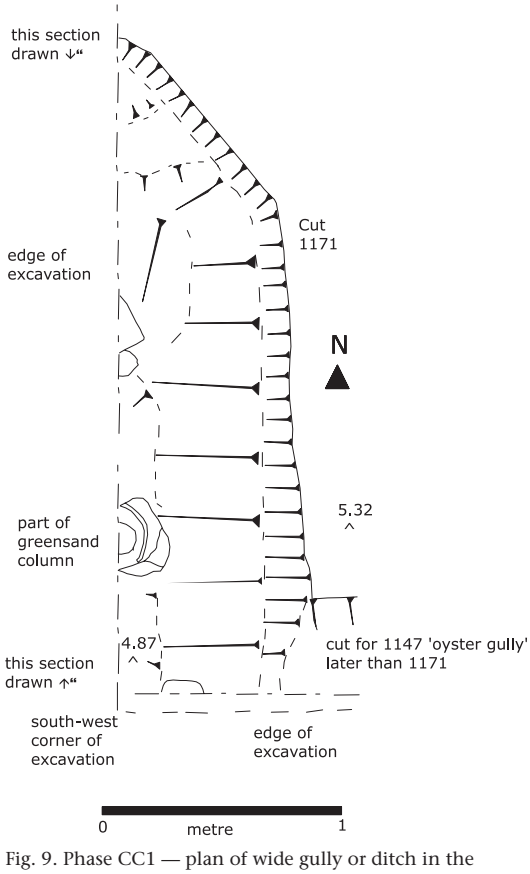

Fig. 9. Phase CC1 — plan of wide gully or ditch in the south-west corner of Area C.

patterns could be observed in respect to the post-holes and it is impossible to offer any structural interpretation for them. Dug into the top of the pre-conquest ditch was a small pit (1164), approximately 1.5 m north–south and *c*. 0.5 m deep. The last feature that can be ascribed to this phase was part of a gully, ditch or pit (1171) in the south-west corner of the excavation (Figs 4, 5, 9 & 10). There were deposits 0.6 m deep filling this feature, including some black silty soil at the bottom. The most noticeable find was part of a carved greensand capital (or column base) in the bottom of this feature.

CC2

The most obvious feature of this phase was a timber building, partly in the trench to the north of the pre-conquest ditch (Fig. 4:1188). A red clay floor, some 100 mm thick, defined the building, which was surrounded by shallow gullies (Fig. 11:1109), presumably for horizontal beam-slots (Fig. 12; photo). On top of the floor was a scatter of large tiles, broken pottery and an approximately square area of charcoal (Figs 11 & 13; photo). This could represent some small-scale industrial process dating from after the timber building had disappeared. On the other hand, the east–west line of pottery seems to respect an internal partition within the building and some of these features may therefore be contemporary with the structure. Drainage gullies 1113 and 1095 ran outside the timber building and cut through the gullies of CC1. In the south-west corner of the excavation was a medium-sized circular pit approximately 1.75 m in diameter with a maximum depth of 1m (Fig. 14:1180). The filling of the pit was mostly deliberate, with clear bands (from the top) of red clay, grey silt, and light brown clay (at the bottom). The fills were remarkably free from finds, in a corner of the excavation that was very finds-rich. No purpose could be found for the pit (Fig. 15; photo).

CC3

The latest activity in this phase saw the digging of a new drainage gully (Fig. 4:1117) to the immediate north of the pre-conquest ditch (Fig. 16; photo). Since the fall of the land at the excavation site is

to the south and to the west, it can safely be assumed that the drainage gullies carried water in those directions.

Significant finds and dating evidence[2]

The CC1 gullies produced 23 small finds, including several sherds of samian ware, some nails, amphorae sherds, a sherd of a mortarium and tile fragments. The CC1 post-holes produced 19 small finds, including glass, nails, amphorae, tiles and samian sherds. The small pit (1164) in the top of the pre-conquest ditch produced nine small finds, including nails, samian and glass sherds. The early gully or ditch (Fig. 5:1098.5 - cut 1171) in the south-west corner produced 30 small finds including samian sherds, tile, nails, worked stone, 1.9 kg of shell and some animal bone.

The CC2 timber building and the debris above it produced 12 small finds including tile, samian, glass and amphorae sherds and a red tessera. The gullies produced some 38 small finds including glass, nails, samian, and tesserae. The CC3 gullies produced some five small finds of glass and samian.

The quantity of shell and the greensand column base or capital from the fills of the ditch or pit in the south-west corner mark this feature out from the rest. Similarly, it can be noted that tesserae only appear from Phase CC2 onwards. Most of these features were dated in part by the samian sherds, by pottery assemblages and by stratigraphic evidence. The early gully or ditch (1098.5) was dated by pottery assemblage 2; gullies (1062; 1162/1120) were dated by assemblages 4 (1062) and 5 and 6 (1162/1120).

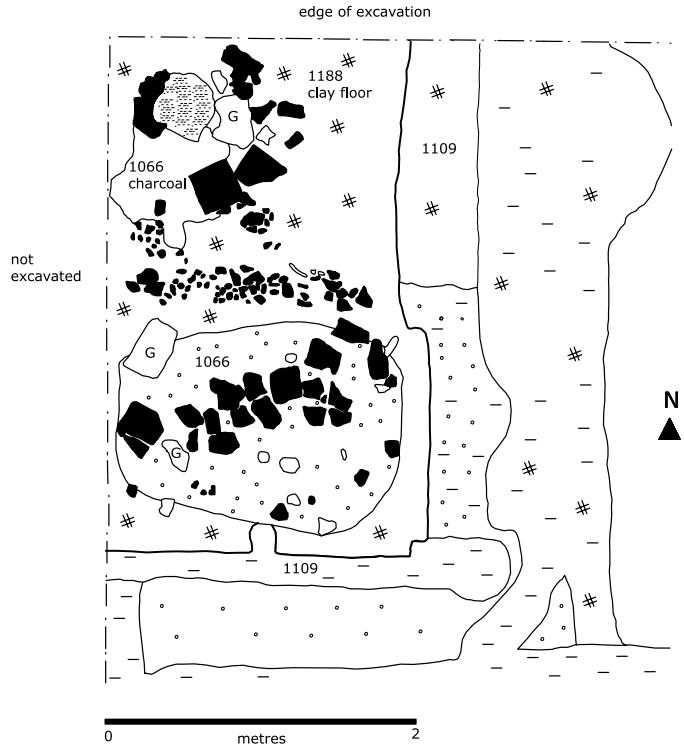

Fig. 11. Plan of timber building in Phase CC2 with overlying tile spread.

Fig. 12. Timber building of Phase CC2 from the west.

PHASE CD: LATE FIRST TO EARLY SECOND CENTURY AD

This phase at Fishbourne coincided with the construction of the Flavian Palace around AD 75–80. To the south of the excavation the walled compound surrounding Building 3 had been demolished and an aqueduct had been driven through the foundations of the compound wall.

Fig. 13. Tile spread on top of the timber building from the north-east.

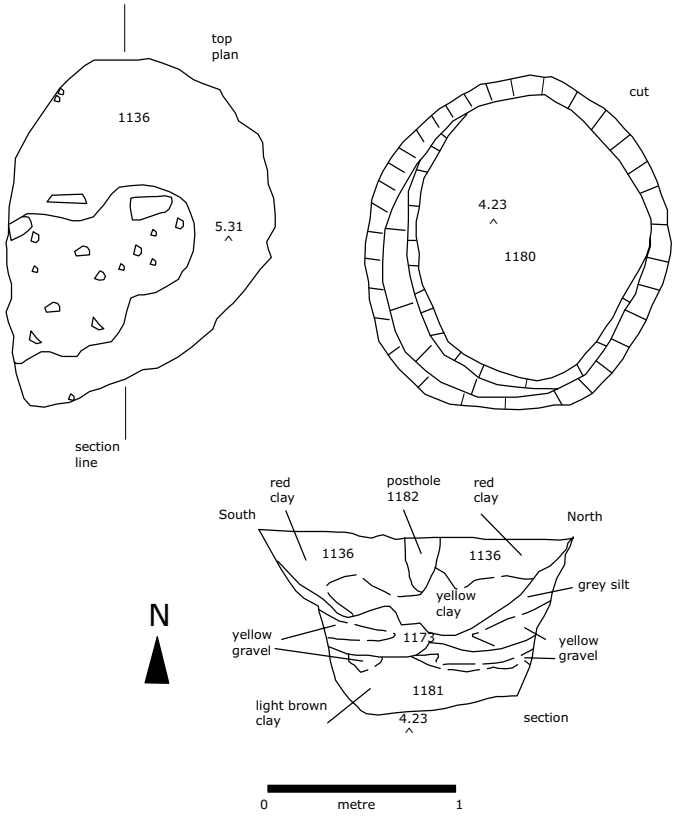

Fig. 14. Plan and section of large circular pit in Phase CC2.

Towards the end of this period a timber building was erected north of the aqueduct. It is likely that midden deposits had begun to form in Area B, in the south-west corner of Area C and to the south of Area C.

In Area C itself, to the north of the pre-conquest ditch, some small pits of unknown original purpose were excavated, and deposits containing a limited amount of building debris, lost items and food remains accumulated over most of the trench. To the south of the pre-conquest ditch an amorphous spread or platform of medium-sized stones, and a gully full of mostly discarded oyster shell were discovered; both these features were to be truncated by the foundations of Building 4 constructed in the second half of the second century.

Small pits

The largest of the pits was rectangular in shape and excavated into the red clay natural (1161 on Figs 17, 23 & 24). The pit measured some 1.5 m east–west by 1.2 m north–south and had a depth of 400 mm; its sides were nearly vertical and it had a flat bottom. A greyish-brown sandy clay deposit filled the pit, which was most remarkable for its finds content. These included pieces of angular flint, several large pieces of quarried (but otherwise unworked) greensand, fragments of oyster shell, and the fragmentary remains of two pottery vessels (Fig. 24; photo) underneath and sandwiched between the large stones. The latter and the pottery vessels must have been thrown or placed in this pit as part of its primary fill. Two smaller pits lay to the west (Fig. 4: pit 1153 oval in plan, and pit 1156 more square in plan). The fills of both of these smaller pits consisted of a dark grey silty soil comparable to that filling the earlier and adjacent gullies of Phase CC.

Stone-spreads

In the south-centre of the trench three areas of very rough stone paving (Figs 17 & 25:1127; 1126; 1178) were located. Although these were separate from each other, there is reason to believe that they originally formed part of the same surface. Area 1126 comprised a deliberately laid platform of medium-sized stones; the lithography indicated that the stones were not local to the area. Area 1127 comprised at least nine medium-sized stones, of which three were flint, three were greensand and three were of non-local origin. Area 1178 to the south had the same characteristics as area 1126, with an average stone size of 260 mm by 300 mm by 70 mm thick. Apart from indicating that on present evidence it was laid outside of any building, it is impossible to speculate on the function of this platform; the platform was presumably truncated by the foundations of Building 4 about 50 years later.

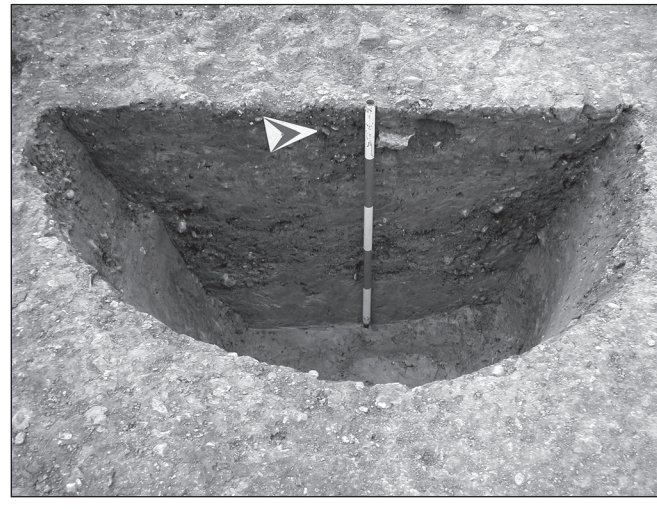

Fig. 15. The large circular pit of Phase CC2 from the east.

Fig. 16. Drainage gully from Phase CC3 from the north-west.

'Oyster gully'

This description was given to a shallow gully (1147) discovered running to the south-west corner of the trench (Figs 17, 18, 19, 20, 21 & 22). The description was as obvious as it was apt since the distinguishing feature of the fill of the gully was a mass of oyster shells. The gully was traced for about 9 m, although it undoubtedly continued to the west, probably draining to the stream, and to the east. In profile it was V-shaped and had an average depth of 300 mm. The fill of the gully consisted of a dark-grey silty clay, flecked with charcoal. Apart from the oyster shells it was rich in other finds. One notable find in the bottom of the gully was an almost intact grey ware bowl, with a hole in its side and with a piece of a rim from a different vessel inside it. This discovery gave rise to much speculation at the time of as to whether this pot had been 'ritually killed' and placed in the gully, perhaps in a final act of closure (Fig. 20; photo). Stratigraphically, it appears that the oyster gully was filled in before the stone platform was laid on top.

Significant finds and dating evidence

Only the larger pit (1161) contained small finds, which included glass, samian and amphorae, in addition to the near-complete vessels and greensand stones mentioned above. It was dated also by pottery assemblage 9. One small pit (1156) contained a nail.

The 'oyster gully' (1147) contained some 160 small finds, including glass, nails, samian, a brooch, two coins (SF 17405 - sestertius of Nero AD 67; SF 16771 - denarius of Vespasian AD 69–71), amphorae, a sherd of mortarium and numerous tesserae. It was also dated by pottery assemblage

8. As already indicated, the predominant find was food refuse in the form of broken shells and some animal bones.

PHASE CE: FIRST HALF OF SECOND CENTURY AD

Major political and administrative changes may have occurred at the start of this period. It is possible that around AD 100 Togidubnus died and that with his death the Atrebatic client-kingdom, as a separate administrative entity, was dissolved and absorbed into the official province of Roman Britain. Given the disappearance of the client-kingdom, it seems likely that principal rationale for Fishbourne Roman Palace also vanished, and indeed that ownership and uses of the building presumably changed. Certainly this is evidenced by a series of radical changes in the Palace itself, with, as time went on, less and less attention paid to the West, East and South ranges of the Palace. Such changes are also seen in the pottery supply in the second century which does not draw on such exotic contacts around the Mediterranean as it had in the latter part of the first century (Lyne 2005, 105–7). Lastly, these effects can also be detected in the quality of the mosaicists working in the building: the Medusa mosaic, laid

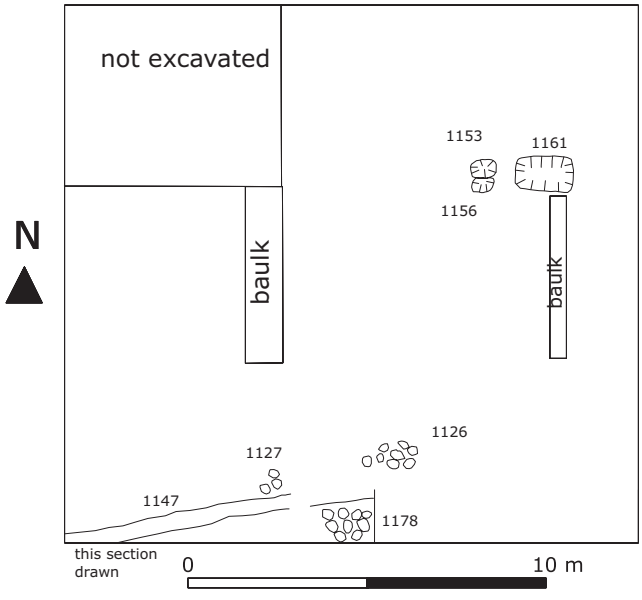

Fig. 17. All of the features of Phase CD.

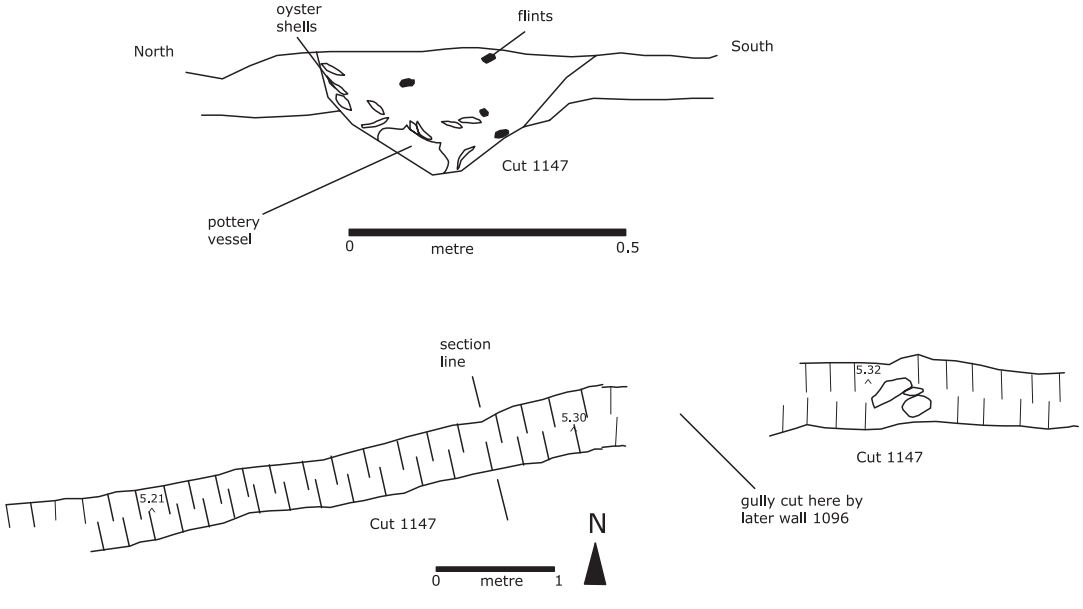

Fig. 18. Phase CD — plan and section of gully part-filled with oyster shells.

around AD 100, has many small design errors, suggestive of a first generation of indigenous craftsmen who were beginning to attempt to design and lay mosaics. The first major building change came at the beginning of the second century, when the aisled hall was modified and a bath-suite was inserted into the passageway between the hall and the east end of the North range (Cunliffe 1998, 111).

In Area A to the south the impressive Building 3 still stood, as for some time did the timber building to the north of it. It is possible that the water pipe discovered in the north-east corner of Area A was laid to bring water to the new bath-suite to the west of the aisled hall. In Area C itself only one feature (a small pit) and deposits beneath Building 4 can be ascribed to this phase.

Fig. 20. Pottery vessel in the gully part-filled with oyster shells from the west (Phase CD).

Small pit

This feature (1154) lay just to the south of the pre-conquest ditch (Figs 2 & 26); it measured approximately 1.3 m in diameter and had a depth of 0.6 m. The dark yellowish, charcoal-flecked, sandy-clay fill contained pottery sherds, including the neck of a flagon, samian, nails, glass, amphora, tile and a cache of oyster shells at the bottom. The

Fig. 21. Samian bowl with fragmentary oyster shells (Phase CD).

Fig. 22. Plastic container filled with fragmentary oyster shells (Phase CD).

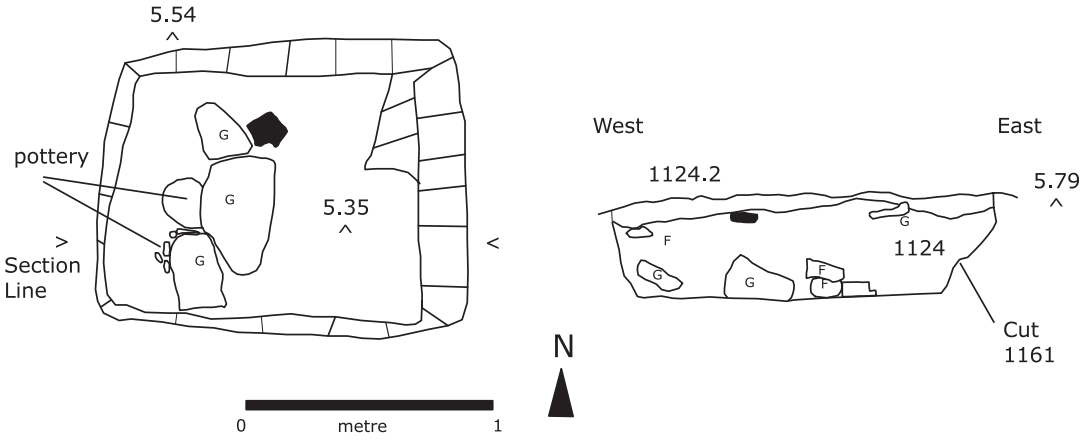

Fig. 23. Phase CD — plan and section of small, square pit.

Fig. 24. Two fragmentary pottery vessels from the bottom of the small, square pit.

original purpose of the pit cannot now be ascertained, but it was clearly filled with soil and some domestic refuse.

Deposits under Building 4

A very small area, formed by a general deposit of yellowish-brown silty clay (1.5 m square by 200 mm deep) was investigated just within the north-west corner of Building 4. These deposits were relatively finds-rich including pottery, nails, samian, amphora, tile, and slag. Both the small pit and the deposits under Building 4 were dated in part by the samian, amphora and pottery finds, and by stratigraphic evidence.

PHASE CF: SECOND HALF OF SECOND CENTURY AD

The pace of change accelerated in the second half of the second century, after what must have been a period of significant structural problems in the North range of the Palace. By the middle of the second century the eastern part of the North range had become unsafe owing to subsidence and was demolished. The western part of this range, however, continued to be occupied, and was provided with an entrance that faced northwards. New timber divisions in some of the remaining larger rooms suggest that the spaces that had been lost in the demolition were reconstituted as smaller spaces in the western part of the range. New heating arrangements were installed and the refurbished western rooms were provided with four new mosaics, of which the most splendid was the now-celebrated polychrome 'Boy on a Dolphin' floor. To the west, south-west and east of this now smaller North range, thick black layers of occupation rubbish began to accumulate, interpreted as deliberate manuring of the Palace gardens with kitchen refuse. Exactly the same phenomenon was observed across the stream to the east. Here Build-

ing 3 still stood '*Facing the Palace*', but to the north of it a thick deposit of midden waste began to build up during the second half of the second century. However, a major transformation of Area C occurred with the construction of Building 4, a substantial building with flint foundations; the north-west corner of this building was located in the south-eastern part of Area C (Figs 27, 28, 29 & 30).

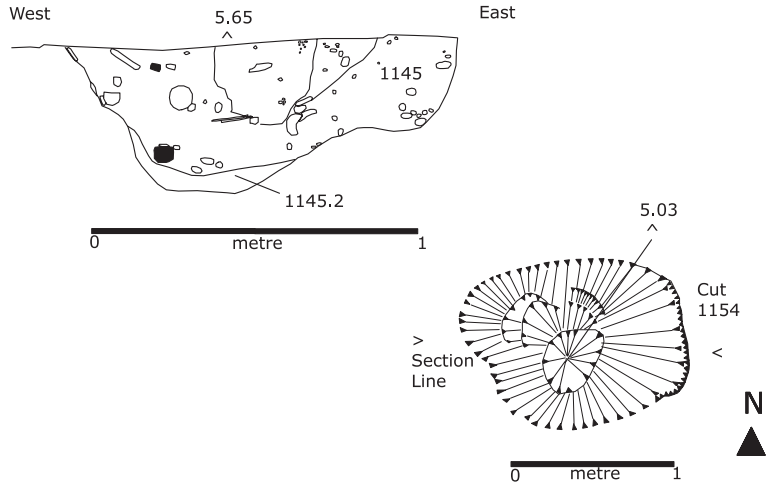

Fig. 26. Phase CE — section and plan of small, circular pit.

Building 4

The remains of Building 4 consisted, in plan, of the corner of a building, measuring (as extant in the Area C) some 9 m east–west by 2.5 m north–south; an internal dividing wall was located in the south-east corner of the trench (Fig. 30; photo). The foundations comprised angular flint blocks, of which some of the largest were 170 mm by 170 mm. Traces of decayed mortar between the flints suggest that the foundations were once mortared, and the presence of the occasional oyster shell argues that Building 4 was constructed after the midden had begun to accumulate. In comparison with Building 3 to the south, there was no indication of greensand facing stones, and the foundations appeared to have been less carefully laid. At the north-western corner of the foundations, bonded with them and extending in a north-westerly direction from the external side of the building, were two reused tiles (1172 - one a tegula, the other an imbrex) which may well have linked up with two reused roof tiles (1079) laid flat a few metres to the north-west. On their own these two small sections of laid tile are difficult to interpret. However, in Area B excavated in 1999, the continuation of this feature was noted and it is now possible to interpret these features as the remains of a drain from the north-west corner of Building 4 to the adjacent stream.

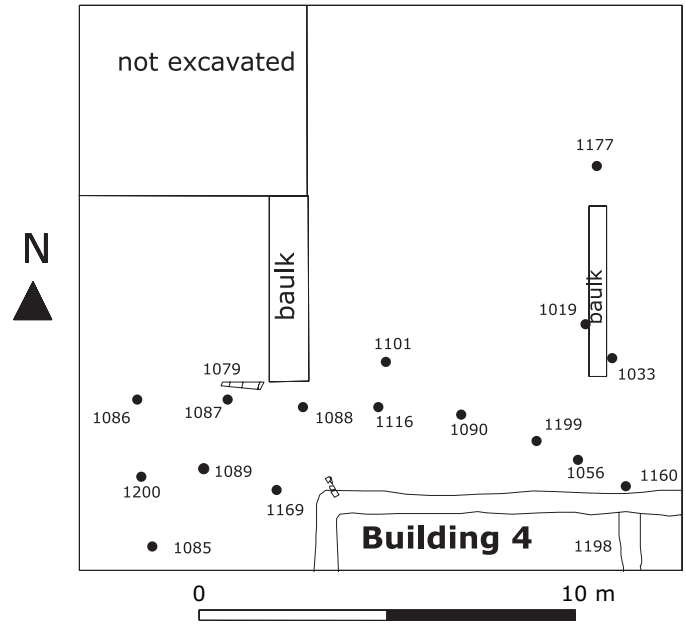

Fig. 27. All of the features of Phase CF.

Given the fraction of the Building extant in the trench, little can be said with any certainty.[3] However, there is space for a rectangular structure measuring some 20 m north–south, with perhaps its longer dimension east–west.[4] A building of this extent would have left the aqueduct intact beyond its southern side. The western side of Building 4

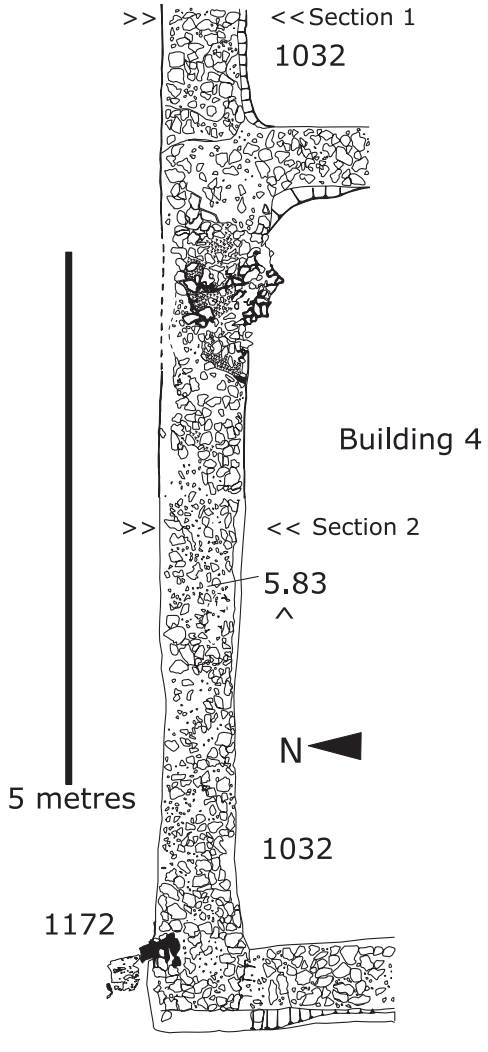

Fig. 28. Phase CF – Plan of the foundations of Building 4.

Fig. 30. Foundations of Building 4 from the east.

would appear to be set about *c.* 3 m to the east of the line of the western face of Building 3. It would be unwise to speculate on the internal arrangements or the function of Building 4, but clearly it is another major structure facing what was left of the Palace buildings.

Post-holes

Associated with this phase is a series of post-holes (Figs 27, 31, 32 & 33), mostly situated north of Building 4 and in an approximate line east–west, with the remainder to the west of the building. The key characteristic in many of these post-holes was the use of flint packing stones (e.g. 1069/1090). Given the limited nature of the excavation it is not possible to comment on their function; one can only suggest that they do not appear to represent any timber building.

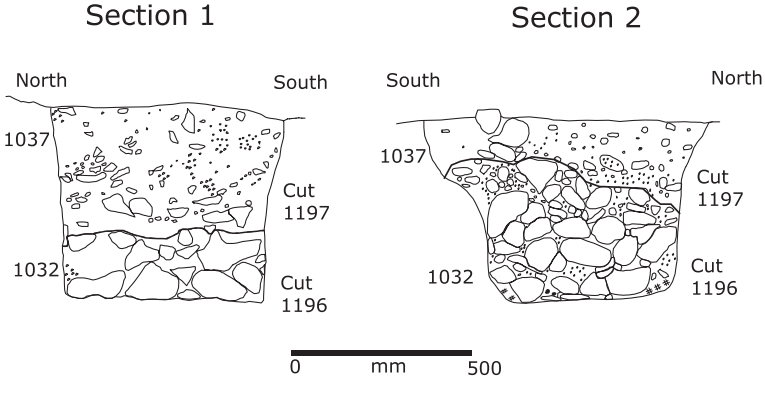

Fig. 29. Phase CF — two sections through the foundations of Building 4.

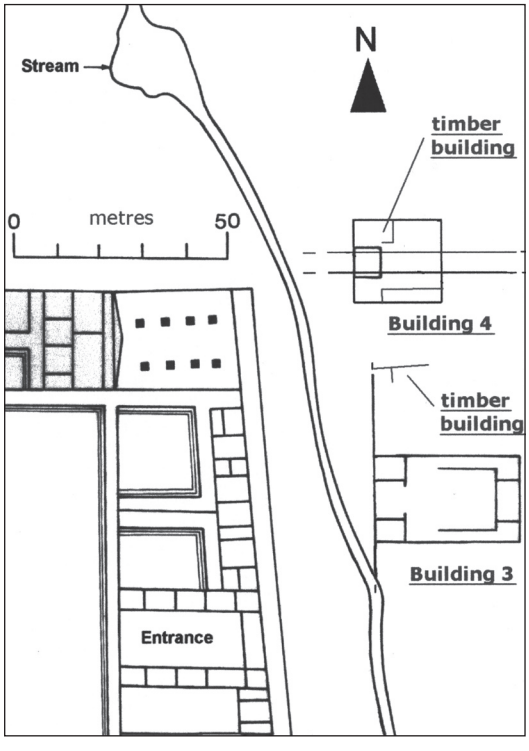

Fig. 34. Plan of Fishbourne Roman Palace showing all the buildings 'Facing the Palace'; (the northernmost timber building had disappeared by the time of the Palace's construction).

Significant finds and dating evidence

There were several small finds from the make-up of wall 1032 of Building 4; the only datable samian sherd was of first-century date. There were some 31 small finds from the post-holes, including samian, amphorae, tile, glass, nails and tesserae, as well as over 100 sherds of pottery recorded as bulk finds by post-hole (pottery assemblage 11).

PHASE CG: LATE ROMAN/EARLY POST-ROMAN

This final Roman (and post-Roman) phase marks the partial destruction by fire of what remained of the old Palace buildings in the final quarter of the third century. The demolition of Building 3 to the south had already occurred in the early decades of the third century. As for Building 4, its presumed demolition or abandonment date is unknown, but given the date of the Palace abandonment, it is likely to have happened sometime in the third century.

Robbing of Building 4

It was apparent during the excavation of the foundations of Building 4 that the foundations themselves had been robbed. For instance, within Building 4, the internal north–south wall had only three courses of angular flint blocks (1097) surviving at the bottom of the foundation trench; the upper fill (i.e. of the robber trench) consisted of dark-brown sandy clay, with occasional fragments of greensand and smaller chips of angular gravel (1034).

Significant finds and dating evidence

The fills of the robber trenches produced some 51 small finds, including samian, amphorae, tesserae, glass and tile. While indicating little about the date of the actual robbing of the foundations, the assemblage of finds from the robber trenches does appear to be uncontaminated by Saxon or later material and it is therefore possible to suggest a date in the late Roman or early post-Roman periods. In addition, contexts apparently sealing the robber trenches (e.g. 1010 over robber trench 1034; 1011 over robber trench 1049) contained over 4000 sherds of Roman date, with only a few intrusive medieval sherds, suggesting that the robbing took place in the Late Roman period.

PART 2 – BUILDING MATERIALS

(Please note that as printed here, the specialist reports provide only an indication and any associated broad conclusions. The reader must refer to the ADS digital archive to gain a complete understanding of the full specialist reports, and to view, for instance, object drawings and distribution plots: http://ads.ahds.ac.uk/catalogue/library — and first click on *Sussex Archaeological Collections* and then volume 144.). It was not easy to decide what information from these reports to place on the printed page, and what to place on the internet. Each reader may approach the material in different ways, with different questions in mind; what is important to some may be unimportant to others. However, attention is drawn here to the faunal and marine shell reports, which are especially comprehensive and informative).

BUILDING STONE by David Bone

Introduction

In total, 165 specimens classified as stone samples (principally building stone) and 43 as small finds were identified, a total of 208 specimens. In practice, there were some stone samples that could have been classified as small finds and vice versa. The numbers affected in this way were relatively small and did not affect the conclusions; therefore no attempt was made to re-classify the finds.

All specimens were identified during the post-excavation

period; none were examined *in situ*. The report starts with a brief description of the principal stone samples, the ornamental stones and some of the other odds and ends. General observations on the material are followed by descriptions of the stone samples by context and then conclusions. The small finds are then dealt with in a similar fashion. An overall summary is provided at the end.

🕮 **Brief descriptions of the stones**
🕮 **Stone samples by context**

Stone samples: conclusions
Phases CA to CB
Few specimens, possible contamination from higher levels.

Phases CC1 to CC3
Again not a lot of specimens, but the first real indication of building stone from a variety of sources.

Phase CD
Significant presence of building stone enables some observations to be made. Firstly, the principal building stones are Mixon, malmstone and Hythe Formation sandstone, all of which are from outside the immediate vicinity of the site. There are only a small number of other stone types. Secondly, there is a significant difference between the three main building stone contexts. By omitting the small number of other stones and focusing on the three main stone types only, an interesting pattern emerges:

Stone spreads (35 specimens)	Malmstone	0	0%
	Mixon	17	49%
	Hythe Fm	18	51%
Above timber building (23 specimens	Malmstone	7	30%
	Mixon	11	48%
	Hythe Fm	5	22%
General southern spreads (11 specimens)	Malmstone	4	31%
	Mixon	5	39%
	Hythe Fm	2	18%

Although there are not a great number of specimens, it is apparent that the context 'stone spreads' contains no malmstone but has Mixon and Hythe Formation sandstone equally represented. In contrast, the 'above timber building' and 'general southern spreads' have similar patterns (allowing for the small specimen numbers) with a very definite occurrence of malmstone. Additionally, the examples of Mixon from the 'stone spreads' were all large pieces, whereas the Mixon from all other contexts (both in this phase and the other phases in this excavation) were much smaller pieces.

This suggests that the 'stone spreads', which contained large, heavy blocks of stone, possibly formed the massive foundations or lower courses of some building, or formed a paved area. Perhaps the 'above timber building' and 'general southern spreads', with less massive stones and including the less dense, softer malmstone formed the upper courses of a building. Alternatively, these two contexts are later and represent the introduction of an alternative building stone (malmstone) to the range of materials used on the site.

Phase CF
A small number of the usual mix of stone types. No specific observations to be drawn.

Late Roman/post Roman
A similar mix of building stone to that in the earlier phases, calcite crystals, red mudstone, ochre and tufa all suggest Roman material. The single small piece of Lavant stone may be Roman or medieval.

🕮 **Stone small finds by context**
🕮 **Stone small finds: conclusions**

All stones: summary
Except for contexts in Phase CD, building stone is sparsely represented and may represent contamination or reuse. Phase CD appears to be the main construction phase, with most specimens arising from three contexts: 'stone spreads', 'above timber building' and 'general southern spreads'. The principal building stones are Mixon, Hythe Formation sandstone and malmstone. The absence of malmstone and the large pieces of Mixon in the 'stone spreads' context is significant enough to warrant an explanation being sought, perhaps in the stratigraphical relationship of this context with the other contexts in this phase.

Typical building stones are also included in the small finds collection, but follow a similar pattern to the building stone collection. Ornamental stones are restricted to Phases CD, CE and CF.

There are 14 specimens (building stones and small finds) that show evidence of burning of which five are from unspecified Late Roman / post Roman contexts and two from the Phase CF 'mostly flint post-holes' context. Little can be said about these. The other seven burnt stones are from Phase CD. The contexts are 'above timber building' (one malmstone, one Mixon), 'general southern spreads' (one Mixon, two Hythe Formation sandstone), and 'midden'; 'oyster gully' (one Mixon, one glauconitic sandstone). Altogether, the small number of burnt stones could indicate the presence of a fireplace or similar structure, rather than the more substantial destruction of a building by fire.

🕮 Tables giving details of 166 stone samples and 44 stone small finds.

CERAMIC BRICK AND TILE by Derek Turner
General
During the excavation of 2002 (FBE02) a policy of total recovery was employed in respect of Roman brick and tile. All material was washed and non-diagnostic (very abraded or non-significant unifacial items) were discarded by an experienced field archaeologist. Of the 1026.937 kg recovered and washed, a total of 494.455 kg (48.15%) was discarded and buried, suitably identified, on site.

The retained material has been boxed by context and recorded by type and weight. A summary of the brick and tile finds by context, type and weight is appended as Table 55. Significant finds such as die-impressed flue-tile and *opus spicatum* were 'small found'. A full transcription of the brick

and tile register is available as an Excel spreadsheet and as an Access data base.

The identified material was divided into six main categories. In percentage by weight order they were:

Category	%
Brick	32.14
Tegula	12.35
Imbrex	4.42
Flue-tile	1.45
'Other'	1.05
Pipe	0.44
	51.85
Discarded	48.15
	100.00

The 'Other' category includes *opus spicatum* and architectural fragments. By weight *opus spicatum* forms the bulk of the category and by individual item count is close to 100%. The unclassified (U/C) column has not been used; all ceramic building material which could not be functionally identified is shown as 'Brick', differentiated only in thickness.

🕮 **Tegulae;** 🕮 **Imbrex;** 🕮 **Brick;** 🕮 **Flue tile;** 🕮 **Water pipe;** 🕮 **Other**

Conclusion

There is nothing in the 2002 brick and tile assemblage to suggest anything other than demolition debris from a tiled building/bath house. It is probable that the detritus was deposited during the second century.

🕮 Table 55. Weight of ceramic brick and tile by context.

🕮 **RELIEF-PATTERNED TILE** by Ernest Black

TESSERAE by Derek Turner

Numbers

During the excavation period and immediate post-excavation phase 355 objects were 'small found' as tesserae (Fig. 36). On the first review 29 of the items were discarded — mostly fragments of abraded chalk and several small flint fragments. On a second review small find 18018 (from context 1184) was eliminated as being a stone, not a tessera. The balance of 325 tesserae broke down as indicated in Table 1.

Table 1. 325 tesserae analyzed by colour.

Colour	Number	Percentage
White	171	52.45
Red	84	25.77
Grey	25	7.98
Light brown	25	7.67
Dark brown	12	3.68
Black	5	1.53
Yellow	3	0.92
	325	**100.00**

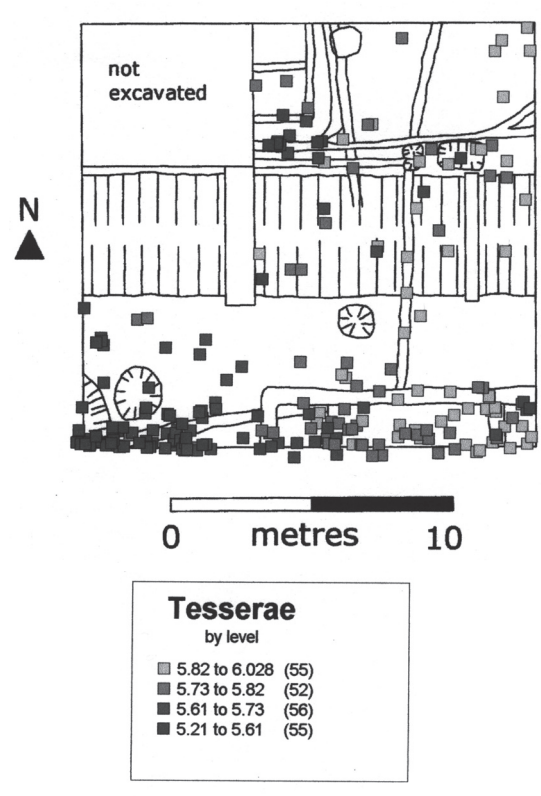

Fig. 36. Distribution of tesserae showing levels.

🕮 **Tesserae distribution by context;** 🕮 **Size and material**

Discussion

The sample is too small to support any but the most tentative hypothesis. The term black and white mosaic is of course a misnomer — the first-century mosaics in the Palace would be better described as grey and white. There is proportionally just sufficient grey material to support the possibility of destruction/replacement of a very simple first-century mosaic — mortar deposits were found only on white and grey tesserae.

A number of tesserae were very sharp and clean suggesting they had not been used. Two white and one red examples (SFs 14377, 14661 and 14659) displayed a marked disproportion between the cross-section and length, and could be the stub ends of 'rods' of mosaic material. This would support the case for a new or renovated floor.

A significant number of white and two grey tesserae showed traces of mortar. Over zealous washing, particularly of the softer chalk tesserae, may have destroyed some mortar traces. Most of the surviving mortar was noticeably pink varying from *opus signinum* to red; grog could clearly be seen in a number of cases. Traces of cream mortar were seen on one chalk tessera and staining on others suggested they too had been mortared. One possibility is that the tesserae had been set in a water-resistant mortar indicating a wet area such as a

bath suite. However several mosaics in the North Wing of the Palace demonstrate clearly a thick layer of hardcore topped with pink mortar being put on top of a first-century mosaic and the new mosaic being mounted in the pink mortar then grouted with cream mortar.

Just over 60% of the tesserae were found on the south side of the excavation in the area associated with a midden deposit; the pattern suggests that the ground level sloped slightly down from east to west at the time rubbish was being deposited.

Three red tesserae were cut from fabric associated with the Dell Quay tilery. Evidence from the tile finds suggests that this tilery was in operation during the period AD 60–70, but it could quite reasonably have been first fired soon after AD 43 since tile was used on the site from period 1A onwards.

In terms of distribution, most of the tesserae were discovered very close to the southern edge of the excavation, with the greatest concentration in the south-west corner. This no doubt reflects the presence of the build-up of 'midden' deposits in this area of the site. The contexts with the most tesserae were usually 5 m by 5 m contexts (1010, 1011, 1012, 1030, 1040, and 1031) in the southern part of the excavation; the feature which contained the most tesserae was the oyster-filled gully, 1098 (Figs 17 & 18:1147).

Conclusion

The intrinsic evidence supports the conclusion that a possibly first-century 'black and white' mosaic had been affected by building works and that the coloured tesserae are the cast-offs from a later polychromatic mosaic.

BLUE FRIT

by Sue Clegg, Andrew Cundy & Christopher Dadswell

This report presents preliminary textural and geochemical data for the blue pellets recovered from Fishbourne Roman Palace during excavations in 2002. The pellets were examined by Laser Ablation Inductively Coupled Plasma Mass Spectrometer (LA-ICP-MS) and by Stereomicroscopy in order to (a) qualitatively determine their chemical composition, fabric and texture, and (b) attempt a preliminary textural (and geochemical) classification.

🕮 Background: blue frit

🕮 Materials and methods

🕮 On the ADS website are photographs, together with a magnified view, of the pellets found in various contexts at Fishbourne Roman Palace during the excavation season of 2002. Beneath each photograph is a printout of the LA-ICP-MS results obtained for each of the pellets.

Results

The texture and structure of all twelve of the pellets was closely examined by the naked eye and also microscopically. As a result of this examination they were divided into four types, conveniently labelled as Fishbourne Roman Palace (FRP) Types I, II, III and IV (Table 2).

The structure of FRP Type I shows that the ingredients of the pellets had been roughly ground. The quartz grains are large and there are few inclusions. The composition of FRP Type II pellets is very different: the ingredients of these pellets have been finely ground, and there are some small inclusions. The quartz grains are also smaller in size. FRP Type III pellets varied slightly from those of Types I and II: although the ingredients of these pellets had been finely ground there were a few large grains of quartz, but very few inclusions. The ingredients of FRP Type IV pellets had been finely ground and there are no inclusions.

Table 2. Blue frit pellet fabric and structure types: relation to the chemical composition groups.

Group	Context/Sample ID
FRP Type I	FBE02 1145/173632 (a); FBE02 1010/14932; FBE02 1013/14376
FRP Type II	FBE02 1139/17463; FBE02 1071/17421 (a); FBE02 1071/17421 (b); FBE02 1005/14448
FRP Type III	FBE02 1024/15353; FBE02 1029/16203; FBE02 1006/16512
FRP Type IV	FBE02 1005/14174; FBE02 1005/14454

Chemical analysis of the pellets by LA-ICP-MS shows significant variation in the amounts of copper, iron, silica, barium, tin and lead found in the individual pellets.

These variations, while based on qualitative, rather than quantitative LA-ICP-MS scans, indicate considerable heterogeneity in either the material sourced to produce these pellets, or in the mixture of the ingredients. The presence of above-background levels of tin and lead, alongside copper, is common to all but one of the samples, raising the possibility that scrap metal, in particular bronze scrap, was an important ingredient in the production of the pellets. Further work to quantify these geochemical variations is under way.

Discussion and conclusion

The results of this study suggest that the Romans did not use a standard recipe when producing blue frit and that the pellets were most probably produced by individual manufacturers who used the various materials that were available at the time of production; this resulted in the production of a variety of differing shades and textures of blue pellets (with different geochemical composition). Cost may also have come into consideration. According to Damiani *et al*. (2003), blue frit pellets could be made cheaply from discarded pieces of scrap metal, or they could become an expensive product when using copper filings or malachite. It is likely that the latter would have been used sparingly as part of a vignette whereas the cheaper pellets would have been used to cover a whole wall as a background colour in a wall painting.

The ingredients for making blue frit would have been readily available during the construction of Fishbourne Roman Palace. During the excavation of the Palace evidence of base foundations of Belgic-type kilns have been found which may suggest that, with all the different professional skills that were required to build such a grand structure, at least some of the pellets may have been produced locally on site. On the other hand the ancient artisan would have brought the tools of his trade, and samples of blue frit pellets, with him.

A detailed examination of the three blue frit pellets (FBE02 1071/17421 [a and b] and FBE02 1139/17363), classified as FRP Type II, Table 2, are quite friable to touch and different in texture and structure from all the other pellets

found during the excavation. They were found in a very early ditch predating AD 43. During the excavation the bottom of the ditch was moist and owing to the clayey condition of the soils, small objects could easily have become attached to the soles of footwear. It has been suggested that the location of these pellets, found in the excavated ditch, could be the result of contamination. Reference to the date of these finds should, therefore, be treated with caution since painted plaster from this early date is very rare (Clegg, 2005).

The FRP Type II blue pellet, FBE02 1005/14448, is of a similar composition to the three Type II pellets mentioned above, but unlike them, is not friable to touch.

Dr W. J. Russell (1892) who wrote a paper on colours from the Egyptian site of Medum, which was excavated during the late 1890s by Sir Flinders Petrie, said after examining a large number of blue frit pellets that '… every specimen of the frits that I have seen has been in the friable condition … [and] … on rubbing they can be readily reduced to powder.' (p 46: 5 11) The three friable Type II pellets from Fishbourne were most probably made by a specialist and may have been manufactured at (and imported from) a factory site, such as that found at the Campanian city of Puteoli (Forbes 1955). They may have been brought to Fishbourne Roman Palace by a master-craftsman. These three friable pellets could have been samples of a larger batch used to decorate parts of the interior walls of Fishbourne Roman Palace during its initial construction. There is some textural evidence that pellets of different periods have different sources — early ones are imported, later ones are local.

The skill of the ancient craftsmen in developing one of the first synthetic pigments has to be admired especially for producing such a variety of different shades of blue. The poet Horace (65–8 BC) informs us that 'the Greeks … once … [they had] overc[o]me [their] wild conqueror[s] … brought the arts into rustic Latium'[5] Subsequently, through their newly acquired technical expertise, the 'rustic' Roman conquerors brought the art of interior decoration to these so-called 'uncivilised' shores.

PART 3 – THE FINDS

THE COINS by David Rudling

🕮 THE COINS

Introduction

The excavations at Fishbourne in 2002 recovered a total of 18 coins. These coins date from various periods: Late Iron Age (i.e. Celtic), Roman, medieval and post-medieval. All of the coins have been recorded and identified where possible (*see* below for the single Iron Age coin and on ADS for a catalogue of the other coins). The Iron Age coin, which was probably issued by King Tincomarus of the Atrebates tribe, is a rare and interesting find and is discussed in detail. Summary discussions by period of the 2002 coin finds are provided below, as is a revised summary (Table 57) of all the coin finds from Fishbourne, 1961–2002. The reader is referred to a previous report for a discussion of all the coin finds from Fishbourne between 1961 and 1999 (Rudling 2005).

The Iron Age coin

Only one Iron Age coin was found during the excavations in 2002. This is a silver minim, probably of Tincomarus, and was recovered from a late first-/early-second-century deposit (context 1081) — a general layer in the south-west corner of the excavation, dated to Phase CD. Two other coins of Tincomarus, including another silver minim, were found nearby during the 1995–99 excavations, and two other Iron Age coins and a Carthaginian/Siculo-Punic coin have been recovered from the vicinity (Rudling 2005). These coin finds may indicate a pre-conquest period of occupation at Fishbourne. The 2002 coin find is described and discussed in detail:

Atrebates, ?Tincomarus, *c.* 5 BC–AD 10. Silver minim of the 'ABC Bird' type: 8 mm diameter; 0.23 g; die axis: 270°; Fig. 39.

Obverse: 'B' in the centre of two interlocking squares forming an eight-pointed star; beaded border.

Reverse: Bird standing right on exergual line, branch in mouth, pellets (representing berries?) under head, below tail: cross, above tail: *c.*6 pellets in a triangle.

Reference: Van Arsdell (1989, 178) no. 562–1; Bean (2000, 242) type TIN3-9.

Special find 17259: Context 1081.

The attribution of the ABC Bird-type minim is uncertain and has recently been reviewed by Rudd (2004, 13). The variety bearing an A on the obverse was first ascribed to Amminus (e.g. Mack 1953, 95: no. 316; Allen 1960, 238). However, in his major work on the *Celtic Coinage of Britain*, Van Arsdell (1989, 177–8) allocated both the A and B varieties within Verica's coinage, and Hobbs (1996, 110) repeated this attribution for the three examples of the A-type in the British Museum. More recently, Bean (2000, 131) has attributed all three varieties (i.e. A, B and C) to Tincomarus. Bean's allocations are based on stylistic links to other coinages certainly of Tincomarus, including the presence of the letter A or B behind the bust on one of Tincomarus's silver coins (Van Arsdell 1989, no. 397). The C variety is explained as an abbreviated patronymic (i.e. to claim descent from a Commios) (Bean 2000, 135). Alternatively, the C variety may reflect the order of issue, following the minims with A and B (N.B. Bean notes that the C is crudely engraved and off-centre compared to the neat A or B on the other two types, and he suggests that the C-type is likely to represent a 'bridge' between his Classical (TIN3) and Crude (TIN4) series). Thus whilst there is some reason to link the ABC Bird-type minim to Tincomarus, there is no reason

Fig. 39. Silver minim of the 'ABC' type ?Tincomarus.

to attribute it to Amminus, and it is 'not much like most of Verica's other minims' (Philip de Jersey pers. comm.). Previously I allocated the Fishbourne example to Verica (Rudling 2003, 6–7), but I now feel that it is probably (but not certainly) an issue of Tincomarus.

Philip de Jersey, who maintains the Celtic Coin Index at Oxford, has kindly informed me that the Index contains details of ten examples of the A-type minim; three examples of the B-type and two examples of the C-type. He thinks that all three B-type coins come from the same pair of dies. He further states that whilst one of the two C-type coins shares the same reverse die as the B coins, the other coin (that described by Chris Rudd in his sales list) 'seems to be from a different reverse die'. However, both C-type coins share the same obverse die. No die links are noted by either Bean (2000) or Philip de Jersey (pers. comm.) between type A and types B or C.

The findspots recorded in the Celtic Coin Index for all three sub-types of the Bird minim indicate a focus around Chichester/Fishbourne. Type A coins are recorded from: Climping, Westhampnett, Little Harting, and Chichester (two coins, from archaeological excavations in Chapel Street and Tower Street respectively) — all in West Sussex; and one coin from Hayling Island, which is just over the border into Hampshire. The three B-type coins are more widely dispersed: the Fishbourne specimen, plus one from 'Romsey, Hampshire' and one from Wanborough, Surrey. (N. B. Bean (2000, 276) records one type A and three type B Bird minims found at Wanborough but not now deposited in the British Museum, whilst Van Arsdell (1989, 177–8) notes that 'some' examples of both A- and B-type minims were found at Wanborough.) Only one of the two C-type coins recorded in the Celtic Coin Index has a provenance: 'near Southampton', Hampshire.

Martin Henig (1974, 220) and Van Arsdell (1989, 178) have suggested that the inspiration for the Bird reverse common to all three sub-types of these minims may have been an intaglio — a pre-Flavian plasma intaglio from the 1961–69 excavations at Fishbourne having a similar design (Cunliffe 1971b, 88–9 & plate 18: no. 2). However, Bean (2000, 152) suggests that if this design is 'not of native invention', it may be copied from a silver quinarius of Lepidus and Mark Antony of *c*. 43–42 BC (Crawford 1974, 489/3) which bears a lituus, jug and a raven on the obverse side of the coin.

The Roman coins

Pre-conquest silver

One of the 12 Roman coins found at Fishbourne in 2002 dates to the pre-conquest period. This is a worn Republican silver denarius issued by Crepusius *c*. 82 BC. It was recovered from the same deposit (context 1081) that also yielded the Iron Age silver minim (*see* above). Whilst the number of recorded pre-conquest Roman silver coins from the Fishbourne Palace site and adjacent areas now totals 12 (*see* Table 57), all or most of these coins may have arrived at Fishbourne during, or after, the Conquest of AD 43.

Claudian coins

The 2002 excavations produced a further four, and possibly five, Claudius I asses with Minerva-type reverses. All these finds are unfortunately in poor condition, and may include irregular issues. They add to the 78 previous such finds from Fishbourne, but this large amount of coinage does not necessarily mean that a phase of Roman military activity began at Fishbourne at the onset of the conquest, i.e. in AD 43 (Rudling 2005, 102). Unfortunately, none of the 2002 Claudian coins were recovered from well-sealed or early contexts.

Coins of the later first and second centuries

Other first-century coins include a sestertius of Nero and a denarius of Vespasian (both from context 1098: midden deposit), and a dupondius of Domitian (context 1080 — a general layer, dated to Phase CD, in the middle of the excavation above the filled pre-conquest ditch). The sole second-century coin is a denarius of Marcus Aurelius (context 1002: topsoil). The coins of Vespasian and Domitian add to the 56 coins of these reigns from previous excavations at Fishbourne, and together they represent the periods of construction and initial occupation of the Palace.

Coins of the fourth century

Two more fourth-century coins were discovered in 2002. One is a commemorative issue (AD 337–340) of Helena. The other is a very worn/eroded coin of the House of Valentinian. It has the reverse type: GLORIA ROMANORVM, emperor dragging captive, and is dated to AD 364–378. This coin and a coin of Gratian found during the 1961–69 excavations are the latest Roman coins to have been found at Fishbourne. Both of the fourth-century coins found in 2002 were retrieved from topsoil contexts (1006 and 1002 respectively).

Post-Roman coins

The medieval coins found at Fishbourne in 2002 comprised two cut farthings of the Short Cross coinage of 1180–1247. A Short Cross coinage cut halfpenny found during the 1961-1969 excavations has now been identified to Class 5c (i.e. King John not Henry II or III as previously recorded). The post-medieval coins consisted of a single halfpenny of each of William III, George I and George II.

🕮 The coin catalogue

THE SIGILLATA by Geoff Dannell

The samian from the 2002 excavations (Figs 41, 42, 43 & 44) confirmed the trends and tendencies of the assemblages from the 1995–99 excavations:

- That from the early ditch has a closing date of *c*. AD 15/20. It comprises entirely Italian and Gaulish provincial copies of wares of Arretine tradition. There is no early South Gaulish ware as yet, although the kilns at la Graufesenque were active from *c*. AD 10. This suggests that the routing for this class of pottery came neither through inland Aquitania, since there is nothing from the early Montans kilns either, nor from the Garonne/Gironde. It is more likely that pottery was carried between the amphorae in direct consignments, or through a redistribution network based either on the Rhineland or perhaps Central Gaul and the Seine area, taking into account the few pieces from Lezoux of this period.
- South Gaulish ware starts with standard Claudian samian from la Graufesenque. This implies a date of AD 43 or later, and the most sensible option is that it is a result of trade post-invasion.
- These two early groups (above) clearly demonstrate *a gap in the samian record of around 20 years*.
- The Flavian South Gaulish ware is unremarkable, and there is a little from Lezoux, echoing the trade of the early ditch period.

- Central Gaulish sources are carried on into the Trajanic period, with a reasonably strong showing from Les Martres-de-Veyre. After *c.* AD 120, the samian is exclusively from Lezoux. There is little indication of the latest types, probably only a single Curle 23 being recorded. This may reflect the area investigated, rather than the site as a whole.

In general, apart from the early ditch, the samian almost certainly comes from rubbish deposits, which have themselves been stirred around. Many pieces are small and the edges worn.

The distribution of arretine and samian finds was widespread and shows no clear pattern, other than a concentration in the south-west corner (no doubt reflecting the presence of the 'midden') and a thinning-out north of the pre-conquest ditch. The contexts containing most finds were upper 5m by 5m contexts in central and southern parts of the trench, with a significant number in the 'oyster gully' (1098).

SAMIAN POTTERS' STAMPS by Brenda Dickinson

Each entry gives an excavation number, the potter (i, ii etc., where homonyms are involved), the die, form, reading, published example (if any) and date.

Superscripts a and b indicate:
a A stamp attested at the pottery in question.
b Not attested at the pottery, but other stamps of the same potter used there.
Ligatured letters are underlined.

1 1027/15565 Damonus 5a Dish DAMO[O] La Graufesenque. *c.* AD 40–55.
2 10982/17301 Damonus 11c Dish DAM[ONVS] (Polak 2000, pl. 8, D2) La Graufesenque. *c.* AD 40–55.
3 1012/14684 Libertus iii 2c — LIBER[TIM] (Simpson 1987, fig. 64, 46) Lezoux. *c.* AD 150–180.
4 1057/16432 Maceratus 2c 33 MACERATI Lezoux. *c.* AD 150–180.
5 1057/1643 Memor 3a 15/17 or 18 ME[MORISM] (Polak 2000, pl. 14, M63) La Graufesenque. *c.* AD 70–90.
6 1028/17024 Ponteius 1a 15/17R or 18R OFPO TE'I (Polak 2000, pl. 17, P70) La Graufesenque. *c.* AD 75–100.
7 1007/14314 Sarrutus 1a 15/17 or 18 OF.SARRVT (Walke 1965, Taf. 44, 336) La Graufesenque. *c.* AD 70–90.
8 1098/7652 MA[? on form 18, South Gaulish. Neronian.
9 1119/17043]A? on form 33, South Gaulish, probably made at Banassac. *c.* AD 95–145?

THE FINE AND COARSE WARES by Malcolm Lyne

The 2002 season of excavation yielded 27,583 sherds (267,600 g) of pottery from 140 contexts. As with the 1995–99 excavations, the bulk of the sherds are Roman and of first- to third-century date, with a just a little fourth-century and medieval material from the uppermost levels: 927 sherds (8986 g) of the pottery are from the Late Augustan ditch (Phases CA and CB) and published elsewhere (Lyne 2005a).

🕮 Methodology and pottery assemblages

Discussion

The developing pattern of pottery supply to Roman Fishbourne has been discussed in some detail elsewhere in relation to the 1995–99 excavations (Lyne 2005b): the 2002 season

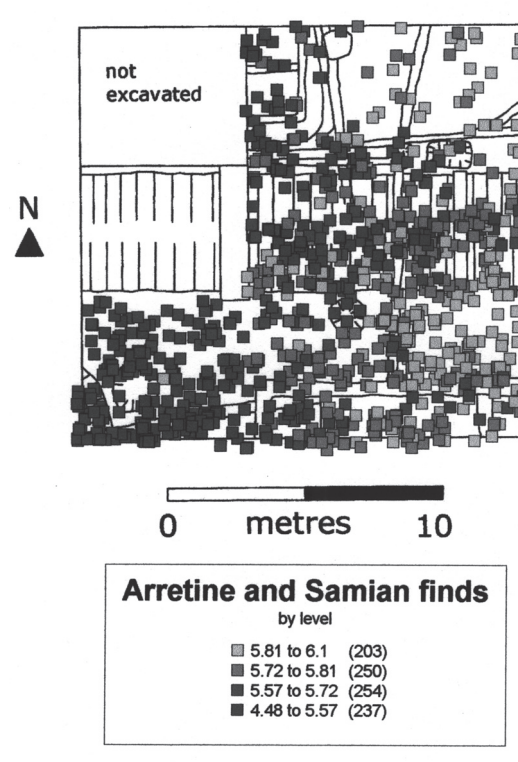

Fig. 43. Distribution of Arretine and Samian finds.

material is, however, important in that it furnishes us with considerably more information about this developing pattern during Phases CC1, 2 and 3 immediately after AD 43.

Phase CC1 is dated by pottery to *c.* AD 43–60: it sees the gradual phasing out of local handmade 'Overlap' wares and their replacement by similarly handmade and tournetted grey and blackened grey wares from newly established pottery-producing centres at Rowlands Castle and in the Arun valley. Imports include Gallo-Belgic TR3 girth beakers and other forms, TN platters and White ware butt-beakers, as well as South Gaulish Samian. These post-conquest fineware imports, as noted elsewhere (Lyne 2005a), make up single-figure percentages of the Phase CC1 assemblages; much less than their share of the assemblage from the Late Augustan ditch.

The pottery assemblage from the Phase CC2 tile oven base within the timber building (Assemblage 7) suggests a *c.* AD 60–70 date for it and is dominated by handmade and tournetted grey wares from the early Rowlands Castle and Arun Valley kilns: any 'Overlap' wares are now entirely residual in nature. Coarse-sanded local oxidized cooking-pots/casseroles similar to *caccabi* from Rome (Lyne 2005, 106), as well as other forms in fabrics C12A and C12B, made their appearance shortly before AD 60 and make up 14% of the pottery from the oven base. Imported finewares include South Gaulish Samian and Terra Nigra but are still relatively insignificant.

The beginning of Phase CD *c.* AD 70 saw the virtual disappearance of handmade and tournetted grey wares from the Rowlands Castle and Arun Valley kilns and their supplanta-

tion by wheel-turned products from the same sources: the locally-produced wares in fabrics C12A and C12B continued to be significant (12%). South Gaulish samian shows an increase in significance to 13% of Assemblage 8 and small quantities of fine cream wares in Fabrics F6 and F12, together with mica-dusted Hardham 'London wares', were now supplied to the Palace.

Only one of the early pottery assemblages, Assemblage 7, is large enough to be quantified by Estimated Vessel Equivalents and does not supply any ceramic evidence for specialised activities that may have been taking place on the site.

THE AMPHORAE by David Williams

General comments

The amphora assemblage from the 2002 excavations consists of 529 sherds weighing 38,910 g, comprising mostly body sherds and covering a wide range of types. Amphorae from the southern Spanish province of Baetica, containing olive oil and fish-based products, form a large part of the assemblage. These are mostly made up of thick body sherds of the globular Baetican olive-oil container Dressel 20. This globular-shaped amphora with oval handles and short spike is the most common amphora form imported into Roman Britain. It was produced along the banks of the Guadalquivir River and its tributaries between Seville and Cordoba in at least 100 different centres (Ponsich 1974; 1979; 1991; Remesal 1986; Peacock & Williams 1986, class 25). This form was occasionally stamped on the handle and sometimes bears complex *tituli picti* which are interpreted as fiscal controls (Rodriguez-Almeida 1989). Dressel 20 was made over a long period, beginning in the reign of Augustus and lasting until shortly after the middle of the third century AD. In Britain Dressel 20 commonly reach between 50–80% by weight of the total amphora assemblage at a variety of sites (Williams & Peacock 1983). At Fishbourne, the Dressel 20 weight represents a shade over 50% by weight of the assemblage. Dressel 20 rims provide a useful dating source, since they can be seen to evolve over the period of their production. Six Dressel 20 rims were recovered from Fishbourne. Comparison with the well-dated statigraphical classification of Dressel 20 rims from the Swiss forts of Augst and Kaiseraugst suggest that two of the Fishbourne rims date to around the period AD 30–50 and four to around the period AD 50–70 (Martin-Kilcher 1987; *see* catalogue below). However, such relatively close dating for this form may be somewhat optimistic, given that on occasions shipwrecked cargoes have been found to contain a range of amphorae of different phases (cf. Keay & Carreras 1996, 438). It is, therefore, probably better at this stage to regard the Fishbourne Dressel 20 rims as generally representative of the second half of the first century AD.

Three medium-thick body sherds, and part of a median grooved handle probably belong to the Haltern 70 type, which was produced from the mid-first century BC to the first century AD. This form has an everted collar rim and oval handles with vertical groove, it shares the same heterogeneous range of non-plastic inclusions in the clay paste as Dressel 20, and also comes from the region of the Guadalquivir Valley, probably in the middle section around Seville, where several kilns have recently been found (Peacock & Williams 1986, class 15; Carreras 2003). Rather than olive oil, this amphora type seems mainly to have carried olives, on occasion preserved in *defrutum* (Liou 1982; van der Werff 1984). *Defrutum* and *sapa* were syrups made by boiling must, similar to the modern *vins cuits,* and may also have been used to preserve fruits such as olives (van der Werff 1984, 380).

The remaining Baetican amphorae are made up of a range of forms covered by the terms Dressel 7–11 and Southern Spanish, which according to the *tituli picti* associated with them suggest that they predominantly carried fish-based products such as *muria*, *liquamen* and garum. They come from around the coastal areas of southern Spain. The date range varies according to the form, however, in general they span from the late first century BC to the mid-second century AD (Peacock & Williams 1986, classes 16–19; Martin-Kilcher 1990). Of particular interest is the find of a Dressel 7-11 rim from a pre-conquest ditch at Fishbourne (context 1084, sf 17506). This form is known from a range of pre-conquest sites in late-Iron-Age Britain (Peacock 1971; Williams & Peacock 1994).

Wine amphorae account for about 42% by weight of the assemblage. By far the most common form is Dressel 2-4, a cylindrical amphora with a simple rounded rim, long bifid handles and a solid spike. This type dates from the mid-first century BC to the early third century AD and was produced in many different areas around the Mediterranean basin and beyond (Peacock & Williams 1986, class 10; Arthur & Williams 1992). A cursory examination of the Fishbourne fabrics in the hand-specimen suggests that they originate from many different production sources. It is interesting to note that only one of the 173 Dressel 2-4 sherds belongs to the distinctive 'black sand' fabric characteristic of an origin around the Bay of Naples region of Italy (Peacock 1977a; Peacock & Williams 1986, 87–8). This fabric was particularly common amongst the Dressel 2-4 amphorae recovered from previous years' excavations at Fishbourne in 1995–99. In the report on this material I suggested that the 'black sand' amphorae may have arrived at Fishbourne before, or shortly after, the powerful Vesuvian eruption of AD 79. It is as yet unclear how long it would have taken for the devastated vineyards of the area to resume production following this disaster, although it seems unlikely that the local wine trade would have recovered much before the main thrust of Italian Dressel 2-4 exports had tailed off towards the end of the first century AD (D'Arms 1970, chap. 4; Tchernia 1986, 230–32; Williams & Peacock forthcoming). A date no later than AD 79 is therefore a reasonable premise for the production of the Dressel 2-4 form in the 'black sand' fabric. The single find of a 'black sand' sherd amongst the Dressel 2-4 form from the 2002 excavations suggests that

Table 3. Percentages of different types of amphorae.

	% by count		% by weight	
Dressel 20	228	43.2%	19,682 g	50.7%
Dressel 2-4	173	32.8%	14,279 g	36.8%
Southern Spanish	28	5.3%	1240 g	3.2%
Gauloise series	28	5.3%	904 g	2.3%
Rhodian	20	3.8%	540 g	1.4%
Dressel 7-11	10	1.7%	415 g	0.8%
Haltern 70	4	0.8%	284 g	0.7%
Carrot	1	0.2%	18 g	0.05%
Undesignated	37	7.0%	1558 g	4.0%
TOTALS	**529 sherds**		**38,910 g**	

these deposits date to a slightly later period than the 1995–99 group taken as a whole.

A small number of sherds from the Gauloise series of flat-bottomed, thin-walled, wine amphorae are present. Amongst these is a single rim from the Gauloise 4-type from southern France, but it is difficult to identify closely the remaining handles and bodysherds. It more than likely that most or all of this material also belongs to Gauloise 4, but it is possible that some could represent the other types of flat-bottomed Gaulish amphorae classified by Laubenheimer (1985; *see* also Peacock & Williams 1986, classes 27–30). In Britain, Gauloise 4 is not found in pre-Boudiccan levels though it appears in Neronian levels (Peacock 1978), and by the early second century AD the type had become the most common wine amphora in the province. The comparatively small number of Gauloise 4 at Fishbourne, plus possibly others in the same series, compared to the much higher proportion of Dressel 2-4, suggests a date before the early part of the second century AD.

Another potential wine amphora present in the 2002 assemblage is the Rhodian Style amphora from the eastern Mediterranean, which is represented by 20 sherds, including a rim and parts of single rod handles (Peacock & Williams 1986, Class 9). A close study of the fabric shows a fairly fine-textured fabric containing small, softish, reddish-brown pieces of serpentine and white cryptocrystalline limestone, suggesting Peacock's Fabric 1 (Peacock & Williams 1986 103), with a likely source in the Rhodian Peraea (Empereur & Tuna 1989). This amphora is commonly, although not exclusively, found on early military sites in Britain, possibly because of a tribute imposed on Rhodes by Claudius, although the form probably lasted into the early second century AD (Peacock 1977b).

A single bodysherd is present from the small 'carrot' amphora. An Egyptian origin has been claimed for this type, with the locally grown doum palm as the main contents carried, based on a reading of an inscription on a bodysherd from Carlisle (Tomlin 1992). However, thin sectioning shows that the fabric of this form is quite different from typical Egyptian amphorae, which were made from the Nile silt (Tomber & Williams 2000). Instead, a comparison with known Palestine amphorae suggests that a source in this province appears much more likely and, if dates were in fact carried in these vessels, then perhaps the Jericho region — which was famous for its date plantations — is a potential origin (Carreras & Williams 2002).

🕮 Catalogue of amphorae sherds

🕮 THE MORTARIA by Kay Hartley

Nine examples are described by fabric, with suggested origins, and dated.

GLASS by Denise Allen

The assemblage comprised 284 Roman vessel fragments, 59 fragments of Roman window glass, fragments of 2 faience and 1 glass bead and another enigmatic piece of ?rod of glass or rock crystal (to add to those found in 1998 cat. no. 72).

Roman vessels

67 vessel fragments have been catalogued or listed, and an additional 41 bottle fragments have been identified and listed. Two catalogued items (nos 15 & 44) may in fact be post-medieval in date, but have been given the benefit of the doubt and described just in case — (a further 17 certainly post-medieval fragments have been listed at the end of the report). There are, in addition, 138 indeterminate blue-green blown glass fragments, 27 indeterminate colourless and 11 strongly coloured, of which four are blue, two dark green appearing black, one dark brown appearing black, two yellow green, one green and one turquoise. One very small, thin-walled blue-green fragment came from a deposit of pre-conquest date, and can therefore be added to the small list of glass vessels known to have arrived in Britain at this time, of which very few are blown glass (Price 1996, 53).

The vessel types found consolidate the range found during the 1995–99 excavations, and indeed some fragments (particularly no. 33) may turn out to be part of the vessel of which bits were found in 1999. Several fine coloured vessels of pre-Flavian date are represented, including three fragments of cast polychrome glass (nos 1–3), the mottled blue and white amphorisk or jug (no. 33), and possibly a cantharus (no. 17). There is more good-quality, colourless, facet-cut glass of the Flavian to Trajanic periods, both cast and ground (nos 8–10) and blown (no. 18). There are a number of fragments of common first-/earlier-second-century jugs or jars (nos 34–37), unguent bottles and flasks (38–48) and plenty of bottle fragments (nos 50–51 and a further 41 fragments listed). The only fragments which are likely to date later than the mid-second century are the fragments which are probably from cylindrical cups with two concentric base-rings (nos 24–25 & 28), the commonest glass drinking vessel at this time.

Roman window glass

All 59 fragments are of the matt-glossy variety, in use until about AD 300. The probable method of manufacture has been recently published on the web (www.roman-romanglassmakers.co.uk) and in print (Allen 2002, 102–12). The majority of fragments (47 in total) are blue-green as usual, nine are colourless, one is pale green and two are intriguingly very blue, although there is no way of knowing whether this was deliberate or accidental — being merely the result of having a lot of blue glass in the batch that was melted for making into window glass.

The distribution of glass finds generally follows the other patterns of finds distributions — i.e. a general spread over the site with a suggestion of a concentration in the south-west corner of the trench. The contexts with most glass finds were upper 5m by 5m contexts in the central and southern areas of the trench (e.g. 1010, 1011,1026,1057).

🕮 Glass catalogue
🕮 Table of bottle glass
🕮 Table of window glass

THE COPPER ALLOY by David Dungworth

Over 100 copper-alloy objects have been examined (Fig. 56). Almost all of the identifiable objects are clearly Roman; there are very few post-Roman artefacts. All of the objects were qualitatively analysed using energy dispersive x-ray fluorescence (EDXRF). The results are expressed as alloy names: bronze for alloys of tin and copper, brass for alloys of zinc and copper, gunmetal for alloys of tin, zinc and copper, and each of these described as leaded if more than trace levels of lead were detected. The analysis was carried out on the surface of the objects (i.e. no samples were taken) and the results show the composition of the corrosion products rather than the actual metal. The composition of the surface corrosion products will usually be slightly different from the

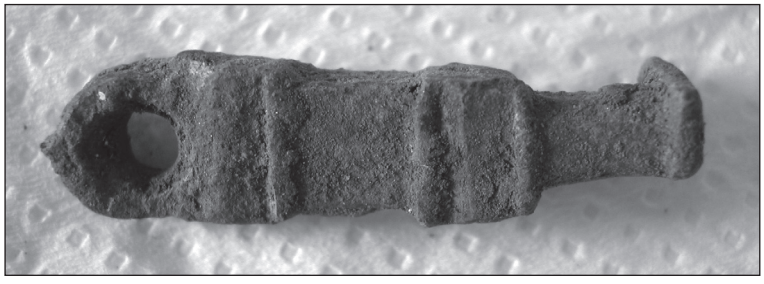

Fig. 56. A small tumbler lock slide key, minus its teeth, of leaded gunmetal; number 37 in the Copper Alloy catalogue.

underlying unaltered metal. The surface composition depends on the composition of the original metal and the nature of the burial environment. The range of copper-alloy artefacts includes items of personal adornment, household objects and fittings, and some military fittings.

🕮 The copper-alloy catalogue

The distribution of the relatively few copper-alloy items is concentrated in the central and southern areas of the trench. The contexts with most copper-alloy finds are the 5 m by 5 m upper layers in the same areas (e.g. 1010, 1011, 1027 and 1030).

THE IRON by Luke Barber

Introduction

The 2002 excavations of Trench C yielded 3322 pieces of ironwork from 92 individually numbered contexts. In addition to this total some 444 pieces of ironwork were recovered from the 1995–99 excavations of Area B which was later subsumed by Area C. The 1995–99 assemblage has already been reported for publication elsewhere (Barber 2005) and is only considered further here where relevant. However, in general terms the 2002 assemblage is very similar to that from 1995–99: although being relatively large, both have a very limited diversity of object types and a high proportion of the assemblages emanates from post-Roman contexts.

The ironwork from the site is generally in poor to fair condition with most being covered with thick corrosion products. As a result, many of the nails were difficult to classify and a number of the objects, or fragments thereof, were impossible to identify. Those objects which were considered to have potentially important features obscured by corrosion products were x-rayed. In the end only 12 objects were selected and of these only one benefited from the clarity of x-ray study.

The main aims of the ironwork report can be summarized as follows:

1) to outline the size, nature and quality of the excavated assemblage;
2) to help interpret the site, if possible, through the characterization of the ironwork assemblage and its chronological and spatial distribution.

The 2002 assemblage, which is summarized in Table 4, has been fully listed on metalwork record forms which are housed with the archive.

Despite the relatively large size of the 2002 assemblage much of the material is derived from unsealed contexts, particularly layers, of medieval or post-medieval origin and/or secondary reworking (some 1658 pieces which constitute 50%

Table 4. Characterization of ironwork assemblage: all 2002 contexts, Area C.

Phase	No. of contexts with iron	Nails										Objects	Sheets/ Strips	Amorphous lumps	Totals
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T?				
Post R-B	16	728	12	3	6	6	26	15	4	1	776	45	13	23	1658
CH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CG	4	23	-	-	-	-	-	-	-	-	10	2	-	-	35
CF	10	29	1	-	1	1	1	-	-	-	118	1	2	-	154
CE	6	14	-	-	-	-	-	1	-	-	7	-	-	2	24
CD	27	593	15	2	2	4	28	1	1	1	623	14	2	9	1303
CC3	1	4	-	-	-	-	-	-	-	-	4	-	-	-	8
CC2	6	10	-	-	-	1	-	-	1	-	9	-	10	1	22
CC1	15	41	1	-	-	-	4	1	-	-	35	6	-	-	88
CB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CA2	3	12	-	-	-	-	1	-	-	-	10	-	-	-	23
CA1	4	3	-	-	-	-	-	-	-	-	4	-	-	-	7
Totals	**92**	**1457**	**29**	**5**	**9**	**12**	**60**	**18**	**6**	**2**	**1596**	**68**	**25**	**35**	**3322**

Key: Nail types: T1-9, T? – nails undiagnostic of type

of the overall assemblage). Although a considerable quantity of Roman ironwork is probably present in these later (or reworked) contexts, only a few pieces can be attributed to the Roman period in their own right. Most objects in these unsealed contexts are either of post-Roman origin (i.e. the horseshoes) or could belong to either period (i.e. knife blade fragments). As with the earlier excavations at the site, there is a dominance of objects in the post-Roman deposits (only 23 out of 68 objects or object fragments are from secure Roman contexts). Although an overview of the material from the post-Roman contexts is given, the current report has concentrated only on sealed Roman contexts.

The post-Roman ironwork

The assemblage of ironwork which can relatively confidently be ascribed to the medieval and post-medieval periods comes mainly from the overlying mixed cultivation horizons, as well as from the modern topsoil and unstratified spoil. Although a good proportion of the Type-1 nails from these deposits are likely to be Roman, only the 26 hobnails can conclusively be proven so. As with the earlier excavations, where diagnostic, most objects from these deposits appear to be of medieval or post-medieval date. The most frequent type consists of horseshoe fragments of which at least six are present. These include both medieval and post-medieval types. Other related items include the Type 7 nails (*see* below) most of which appear to be farriers' nails. Other items include two knife blades, a post-medieval key and several bits of chain link. The remaining objects consist of fragments of binding strip, sheeting and general scrap. As a whole the assemblage, although less diverse, correlates well with that from the earlier excavations which indicated fairly extensive bouts of arable cultivation, particularly in the post-medieval period.

The Roman ironwork

The 76 secure Roman contexts contain a total of 1664 pieces of ironwork of which 1617 pieces (97.2%) are nails or nail fragments (Types 1–9; Fig. 59). The range of ironwork definitely attributable to the Roman occupation of the site is extremely limited. As before, most can be broadly classified into one of three general groups: nails (inc. hobnails), strips/sheeting, other objects/fragments thereof or undiagnostic amorphous lumps (Table 4).

🕮 Catalogue of Ironwork
🕮 Context type and distribution of Roman ironwork

Conclusions

The assemblage of Roman ironwork from the site is limited in its variety with by far the majority consisting of nails. Taking the group from secure Roman contexts as a whole, two observations become apparent. Firstly there is generally very little ironwork in first-century contexts and secondly there are notable peaks of material in later phases. The small quantity of ironwork from first-century contexts is likely to be partly due to the lack of extensive earlier occupation providing a spread of material for residual incorporation into the deposits. The peaks of materials in later phases appear to reflect varying patterns of discard. The assemblage does not contain any 'valuable'/complete and/or larger items suggesting that none of it was 'lost'. As such, the material can all be viewed as reflecting deliberately discarded items.

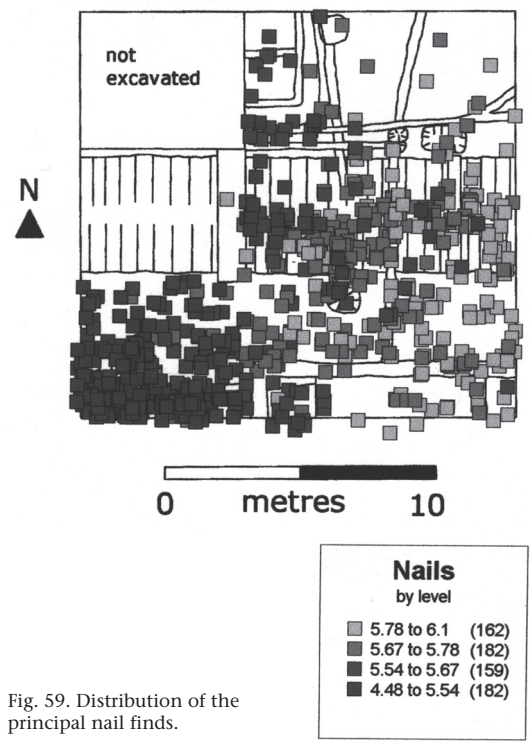

Fig. 59. Distribution of the principal nail finds.

THE METAL-WORKING RESIDUES by Luke Barber

The 2002 excavations produced a very small assemblage of metal-working residues: including fragments of hearth lining, a total of 20 pieces, weighing 470 g from 13 individually numbered contexts. The material is summarized in Table 5.

All metal-working residues were quantified using count and weight by category per context with this information being recorded on proformae in the archive. Only nine pieces of slag and five pieces of hearth lining were recovered from Roman contexts. The assemblage is too small to draw any meaningful conclusions from it. However, the presence of possible smelting slag, though no definite pieces could be isolated, suggests that some of this material may either have found its way to the site with consignments of iron for smithing or have been deliberately brought as hardcore/metalling. A single piece of this material was located in a Roman context in the 1995–99 excavations. Interestingly, the earlier piece was from Context 905 from Trench B, which equates to the 2002 Phase CD from where most of the current ?smelting slag derived. Although no definite smithing slag is present, most of the undiagnostic material is probably from this process, though such low concentrations are typical at most Roman sites.

In addition, there is also a small quantity of fuel-ash slag. This material, which is always in small irregular lumps at the current site, forms when silicate materials such as clay are strongly heated in contact with the ash of a fire causing them to flux and produce a lightweight, often glassy, vesicular slag. Although not diagnostic of process on its own (it can equally be formed in limeburning etc.) its presence alongside probable iron-forging slag suggests it is possibly an additional

Table 5. Metal-working residues quantification (no./weight in grams) from all contexts.

Phase	No. of contexts	Fuel ash slag	Iron undiagnostic	Iron smelting?	Hearth lining	Totals
Post-Roman	5	-	4/82 g	2/50 g	-	6/132 g
CD	5	3/26 g	1/104 g	4/64 g	2/100 g	10/294 g
Pre-AD 43 CA1	3	1/8 g	-	-	3/36 g	4/44 g
Totals	**13**	**4/34 g**	**5/186 g**	**6/114 g**	**5/136 g**	**20/470 g**

residue from the forging process. Likewise, the possible fragments of furnace/hearth lining, which consist of fired clay, some of which have fuel-ash slag adhering, are probably from forging hearths.

THE LEAD FINDS by David Rudkin

Most of the 2.38 kg of lead recovered from the excavations comprised amorphous lumps and dribbles from the casting process and a variety of small bent or twisted off-cuts of lead sheet. There were few recognisable artefacts (Fig. 61). Most came from upper levels and it is probable that they are of medieval or later date.

1. (SF 14333; context 1005; first level; phase CH) Oval disc, or possible gaming counter, with bevelled edge. Max. dia. 19.5 mm, min. dia. 16 mm, max. thickness 4.5 mm, weight 8 g.

2. (SF 14424; context 1011; first level; phase CD) (Not illustrated) Oval disc, or possible gaming counter, slightly domed. Max. dia. 14.9 mm, min. dia. 13.9 mm, max. thickness 3.2 mm, weight 5 g.

3 (SF 14549; context 1010; late Roman–medieval; phase CH) (Not illustrated) Irregular circular disc, or possible gaming counter. Max. dia. 16.7 mm, max. thickness 3.4 mm, weight 6 g.

4 (SF 15829; context 1008; late Roman–medieval; phase CH) (Not illustrated) Irregular circular disc, or possible gaming counter. Max. dia. 16.3 mm, max. thickness 4.1 mm, weight 6 g.

5. (SF 16385; context 1021; robbing of building 4; phase CG) (Not illustrated) Oval disc, or possible gaming counter, with cut mark on underside. Max. dia. 19.1 mm, min. dia.15.5 mm, max. thickness 4.6 mm, weight 7 g.

6. (SF 16939; context 1008; late Roman–medieval; phase CH) (Not illustrated) Irregular circular disc, or possible gaming counter, slightly domed. Max. dia. 21.5 mm, min. dia. 17.3 mm, max. thickness 4.9 mm, weight 9 g.

7. (SF 14983; context 1012; late Roman–medieval; phase CH) (Not illustrated) Musket ball, flattened on one side. Max. dia. 15.0 mm, min. dia. 12.4 mm, weight 16 g.

8. (SF 16387; context 1030; second level; phase CD) Tubular weight made from rolled strip. Weight 11 g.

9. (SF 14495; context 1013; late Roman–medieval; phase CH) Possible washer made from a sub-rectangular, flattened lump, perforated off centre with a circular hole on the upper side, but rectangular, possibly from a nail shank, on the underside. Both surfaces show attempted cut marks. Weight 52 g.

10. (SF 15077; context 1008; late Roman–medieval; phase CH) Rivet or pot-mender, with thick, irregular head and small oval domed end of stem. Weight 21 g.

11. (SF 15849; context 1011; first level; context CD) Rivet or pot-mender, with thick, irregular head and oval, flattened stem. Weight 36 g.

12. (SF 17299; context 1039; above timber building; phase CD) Object of uncertain use. An irregular plug, with a sub-rectangular head, pierced from one end with a tapering rectangular socket. Weight 150 g.

THE WORKED BONE FINDS by David Rudkin

Eight items of worked bone (Fig. 62) were recovered from Roman contexts and one piece of sawn antler from a medieval context:

1. (SF 17970 Context 1179; under building 4; Phase CE) Turned bone peg or stopper with tapering shank and larger diameter tapering head. The latter has two turned grooves, near top and bottom. A 2-mm tapered hole, 3 mm long has been drilled into the end of the shank. Length 47 mm, max. diameter 15 mm. A similar peg, but with more elaborate head came from Colchester (Crummy 1983, 172, no. 4752).

2. (SF 15954 Context 1030; general southern spread; Phase CD) Fragment of bone pin with significant swelling of the shank towards what appears to be the point, although both ends are missing. Length 74 mm, max. dia. 7 mm, min. dia. 3 mm.

3. (SF 18337 Context 1098; upper fill of 'oyster gully'; Phase CD) (Not illustrated) Fragment of bone pin almost identical to 2 above. Length 68 mm, max. dia. 6 mm, min. dia. 3 mm.

4. (SF 18347 Context 1007; late and post Roman; Phase CH) (Not illustrated) Fragment of shank of bone pin or needle. Length 47 mm, dia. 4 mm.

5. (SF 18182 Context 1098.2; fill of 'oyster gully'; Phase CD) (Not illustrated) Point of bone pin or needle. Length 12 mm, max. dia, 3 mm.

6. (SF 17223 Context 1080; 4th level; Phase CD) (Not illustrated) Point of bone pin or needle. Length 37 mm max. dia. 4 mm.

7. (SF18338 Context 1098.2; fill of 'oyster gully'; Phase CD) (Not illustrated) Point of bone pin or needle. Length 36 mm, max. dia. 3 mm.

8. (SF 17002 Context 1100; above timber building; Phase CD) (Not illustrated) Point of bone pin or needle. Length 21 mm, dia. 4 mm.

9. (SF 15818 Context 1027; medieval; Phase CH) (Not illustrated) Sawn-off tip of red deer antler. Length 51 mm, max. dia. 21 mm.

THE WORKED SHALE FINDS by David Rudkin

Twenty-one fragments of shale were recovered (Fig. 63), of which twenty represent parts of a minimum of five different plain armlets.

1. (SF 17262; SF17307 & SF 17709 (×2); context 1098.2; midden; 'oyster gully'; Phase CD) Four fragments of plain armlet with lenticular cross-section. Internal diameter approximately 64 mm, thickness 8 mm, height 10 mm.

2. (SF 17544; context 1081.2; above timber building; Phase CD) Fragment of plain armlet with lenticular cross-section with angularity on inner face where core has been removed. Internal diameter approximately 64 mm, thickness 6 mm, height 8.5 mm.

3. (SF 17203; context 1080: above timber building; Phase CD) Eleven fragments of plain armlet with 'D'-shaped cross-section with sinuous inner face. Internal diameter approximately 78 mm, thickness 11 mm, height 18 mm.

4. (SF16595 & SF 17207; context 1048; first phase gullies; Phase CC1) Two fragments of plain armlet with approximately circular cross-section. Internal diameter approximately 80 mm, thickness 10 mm, height 10 mm.

5. (SF 16427 context 1057; ground surface associated with building 4; Phase CF) Fragment of plain armlet with 'D'-shaped cross-section with internal ridge where core has been removed. Internal diameter approximately 80 mm, thickness 8 mm, height 12 mm.

6. (SF 14590 context 1011; general southern spread; Phase CD) Corner of a highly decorated rectangular tray. Upper surface incised with alternating bands of opposed cross-hatching. Length 91 mm, width 53 mm, thickness 8 mm tapering to 6 mm at edge. The tray (Fig. 64) is unusual in lacking the curvilinear elements of decoration seen on trays from elsewhere, cf. Colchester (Crummy 1983, 71, fig. 74)) and Caerleon (Zienkiewicz 1993, 121–2, fig. 44).

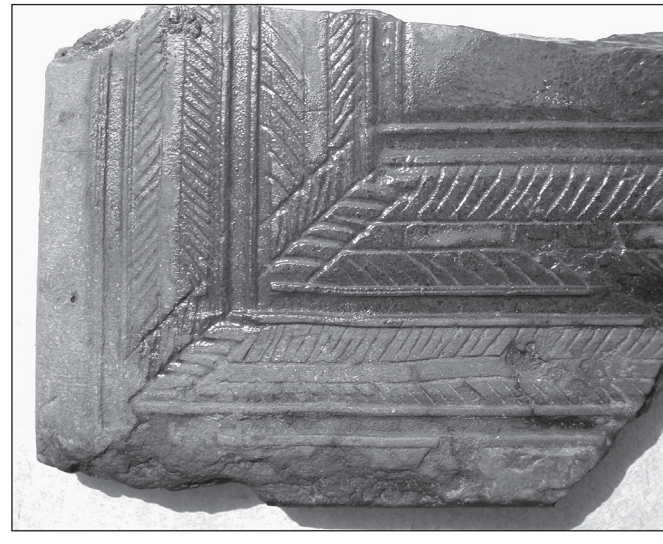

Fig. 64. A corner of the 'shale tray'.

THE WORKED STONE FINDS by David Rudkin

The worked stone (Figs 65, 66 & 67) recovered from the site comprises mainly architectural fragments both structural and decorative and reflects the range of material that was found in the excavations of the 1960s. The only notable exceptions were fragments of a turned cup pedestal and a small mortar.

1. (SF 18057; context 1098.5; early gully or pit; phase CC1) Column capital, roughly squared-off for reuse. Only one small part of the original profile survives, showing a cyma recta moulding. Traces of rectangular mortise holes survive in the upper and lower surfaces, 85 mm × 80 mm upper and est. 75 mm × 70 mm lower. Made from greensand. Apart from one unstratified piece, all the greensand column fragments found during the 1960s excavations occurred in levels predating the construction of the Flavian Palace (Cunliffe 1971b, 71).

2. (SF 18340; context 1178; stone spreads; phase CD) *Opus sectile* element of isosceles triangular shape, max. thickness 33 mm. Made from hard, white chalk.

3. (SF 18341; context 1178; stone spreads; phase CD) (Not illustrated) *Opus sectile* element of equilateral triangular shape, length of sides est. 150 mm, max. thickness 33 mm. Made from hard white chalk.

4. (SF 18342; context 1178; stone spreads; phase CD) (Not illustrated) *Opus sectile* element of isosceles triangular shape, length of sides: two at est. 160 mm and one at 140 mm, max. thickness 33 mm. Made from hard white chalk.

5. (SF 14564 and 15745; contexts 1010 and 1040; late and post Roman and general southern spreads; phases CH and CD) Conjoining fragments of *opus sectile* element of rectangular shape. Made from hard white chalk.

6. (SF 18345; context 1043; above timber building; phase CD) *Opus sectile* element of approximate diamond shape, max. thickness 25 mm. Made from greensand.

7. (SF 15880; context 1030; general southern spreads; phase CD) (Not illustrated) Wall inlay or *opus sectile* element,

broken, but originally of triangular or diamond shape. Max. width 87 mm, max. thickness 19 mm. Made of grey marble.

8. (SF17717; context 1028; above timber building; Phase CD) Fragment of a turned pedestal of a cup or small vase. Base diameter 50 mm, thickness 3.5 mm. Made from very hard and compact, dark bluish-grey to almost black rock, unlaminated and extremely fine-grained, which breaks with a rough to hackly fracture. 'Slate' or 'shale' would be misnomers for this material, as there is no sign of fissility, but it would be fair to describe it as a highly indurated mudrock. It is probably not a Dorset rock, but possibly from a broad Palaeozoic source as close as somewhere in western Britain or north-west France (Prof. J. Allen pers. comm.)

9. (SF16114; context 1029; above timber building; phase CD) Small mortar, broken during manufacture. The polished upper surface shows scribed guidelines for the cutting of the inner and outer edges of the rim. Inner and outer surfaces roughly pecked to shape. Three of the four original lugs remain. Made from Purbeck marble.

THE FLINTWORK by Chris Butler

The 2002 excavations at Fishbourne produced a small assemblage of 90 pieces of worked flint (Table - 🕮). The flint types are the same as those found during the previous excavations (Butler 2005).

Over 92% of the assemblage was debitage, comprising mostly hard hammer-struck flakes, with smaller numbers of soft hammer-struck flakes, blades and bladelets. There were also a large number of fragments and shattered pieces. Three cores and core fragments were also found.

Few of the pieces had any evidence of platform preparation, with most of the flakes either being quite small, or broad and squat in shape. This was partly as a result of using small nodules of pebble flint. Only five pieces are likely to be Mesolithic, with the majority being typical of a later prehistoric flintworking technology. A small number of fresh-looking flakes may have resulted from the construction or demolition of the Roman walls.

The implements included two scrapers, a notched flake and a retouched thermal flake, together with a piercer that had been manufactured on a small flake fragment (Fig. 68:3; SF17321). Three other flakes and fragments were retouched. All of these items are undiagnostic, but would fit a later prehistoric date. The final two implements were more carefully-made items. The first (Fig. 68:1; SF14665) was the broken bifacially flaked butt? end of a flaked axe or chisel, or perhaps one end of a single piece sickle. The second (Fig. 68:2; SF15157) was a fragment from an unfinished or broken arrowhead. It had been invasively flaked over most of one side, with a little invasive retouch near the point on the opposite side. It may be an unfinished leaf-shaped arrowhead or a triangular arrowhead. Both of these pieces date to the Neolithic period. A single hammerstone weighing 615 g was also found. This was a rounded pebble with one flat side, and the opposing side pitted from its use as a hammerstone.

This small assemblage is of similar character to the assemblages recovered during the 1995–99 seasons of excavation (Butler, in Manley & Rudkin 2005a, 15–16). It is entirely residual in nature, mostly coming from Roman contexts, and is a mixture of different periods. The major differences are that the Mesolithic component of the 2002 season assemblage is much smaller than that from the earlier excavations, and for the first time in 2002 there were some diagnostic Neolithic implements found.

🕮 **Flint catalogue**

PART 4 – BIOLOGICAL AND ENVIRONMENTAL ANALYSES

THE MARINE SHELL by Liz Somerville & John Bonell (for 6 figures (Figs 70–75) and 7 Tables (Tables 65–71) *see* 🕮■**)**

Introduction

This report deals with all the marine shell recovered with the exception of the material from the Late Iron Age ditch (phase CA1) which has been reported separately (Somerville, in Manley & Rudkin 2005b). In contrast to the 1995–99 excavations, those undertaken in 2002 included a very rich deposit of faunal material and oyster shell — the 'oyster gully' — in phase CD, and consequently the results and discussion below focus on this deposit, here simply referred to as the midden. The overall analysis of the site is actually made more difficult because of the imbalance in numbers of shells, particularly oyster shells, recovered from CD and from the other phases. Statistical analysis is therefore limited and comparisons are often simply done on the basis of percentages.

The report on the animal bones (Sykes *et al*. in this report) also concentrates on the midden deposit in CD for much of its discussion, and raises questions about the possible origins of the deposit which will be considered in the conclusions. One issue which the bone report raised was that of seasonality. This is notoriously difficult to determine readily from shell as is shown by Classen (1998), although she concentrates on the clam species *Mercenaria mercenaria*, and the approach taken here was to simply address the question of whether a limited harvesting period could be detected.

Methods 🕮

Results and discussion

1. Species present

Results: The material was dominated by oyster (*Ostrea edulis*) in all phases, with cockles (*Cerastoderma edule*) being the next most common bivalve. Overall, winkles (*Littorina littorea*) were marginally more frequent than whelks (*Buccinum undatum*). Mussel (*Mytilus edulis*) was present in nearly all phases but was very fragmentary, so that the MNI calculation is unreliable. The carpet shell (*Venerupis decussata*) was also present in very small amounts throughout. Other species, not all of which are considered edible, were present in very low numbers in the contexts from phase CD. In order of abundance these were saddle oyster (*Anomia ephippium*), which was also present in phase CC1, thick trough shell (*Spisula solida*), prickly cockle (*Acanthocardia* sp), netted dog-whelk (*Hinia reticulata*), limpet (*Patella vulgata*) and flat periwinkle (*Littorina obtusata*). Table 6 summarizes the information on abundance, both by MNI and by shell weight for the common species by phase, while Table 7 gives a breakdown of this information for the differ-

Table 6. MNI and weight of shell for the common species by phase, including data from flotation samples.

Phase	Oyster		Cockle		Mussel		Carpet shell		Whelk		Winkle	
	MNI	g	MNI	g	MNI	g	MNI	g	MNI	g	MNI	g
CH	69	2279.3	37	114	1	6.9	2	13.4	1	1.2	12	31
CG	29	886.7	9	15.8	3	1.7	1	1.8			3	4.8
CF	13	234.4	6	11.6	2	7.7	1	0.1			1	1.4
CE	104	3268	4	6.6	2	9.9	1	0.1	1	0.1		
CD	936	35,605.2	131	331.9	26	379.9	12	67.2	30	75.6	29	90
CC2	7	306.6										
CC1	43	2087.9			1	0.6	1	0.9				
Pre-AD 43 CA2	10	279.4	1	0.9	1	24.2	1	5.1	4	17.2	1	3.4

Table 7. MNI and weight of shell for the common species found in the different context groupings within phase CD, including data from flotation samples.

Phase	Oyster		Cockle		Mussel		Carpet shell		Whelk		Winkle	
	MNI	g	MNI	g	MNI	g	MNI	g	MNI	g	MNI	g
General southern spreads	192	6771.7	39	85.5	4	14.8	3	21.4	3	2.7	7	17.5
Above timber building	97	2577.8	63	164.2	6	12.1	2	16.6	2	7.6	7	14.5
Stone spreads	1	8.7										
Northern pits	20	542.1			1	0.1	1	0.8				
Non-midden total	310	9900.3	102	249.7	11	27	6	38.8	5	10.3	14	32
Oyster midden total	626	25,704.9	29	82.2	15	352.9	6	28.4	25	65.3	15	58

ent contexts within phase CD. The amount of edible material from the oyster can be estimated from the MNI, following the method used by Winder (1980).

Discussion: These summary figures clearly show the main characteristic of the material, which is the dominance of the collection by oyster. However, it should also be noted, both for oyster and especially for mussel, that MNI is likely to be a severe underestimate where there is a lot of fragmentary material. This is because the method for estimating MNI gives a value of 1 to any context which only has fragments of shell from that species, regardless of the amount of shell present. The phase with the most species was CD, but since this is also the phase with the largest amount of shell, this is hardly surprising. Overall, the species range found at Fishbourne in these excavations is very similar to that found in 1995–99 (Somerville & Bonell 2005a). To judge from modern distributions (Seaward, 1982), the species present could have come from the nearby channel coast with the sole exception of the flat periwinkle (*L. obtusata*), which is not recorded from the Solent area but is found in the Portland area immediately to the west.

As is usual with marine molluscs, the amount of meat represented is not large compared to the MNI and shell weight. The largest amounts are present in the contexts from phase CD, but even the midden only represents between 4.5 and 5 kg of edible meat. Thus oysters, whilst making a contribution to the variety of the diet, were probably not very significant in nutritional terms.

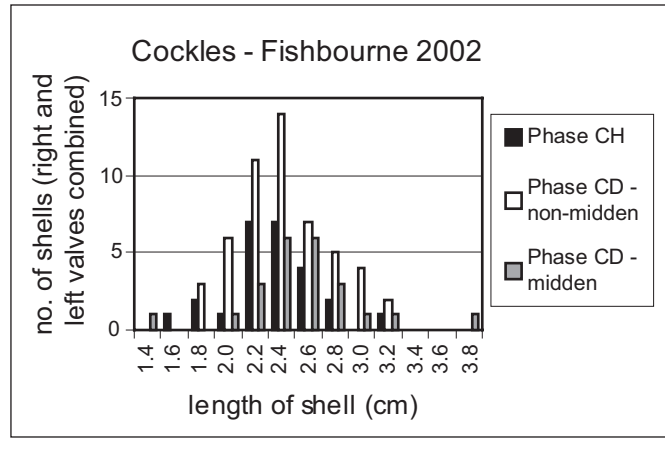

Fig. 69. Marine shell: size of cockles.

2. Species other than oyster

Only cockles (*Cerastoderma edule*) and winkles (*Littorina littorea*) were represented by sufficient numbers of whole shells for any further quantitative analysis to be worthwhile. Data on shell metrics for all species are given in the archive. Phases CH and both groups of contexts within CD yielded sufficient numbers of whole cockle valves for comparison of overall size and this is shown in Figure 69.

It is clear that there is a complete overlap in the distributions. The average lengths are slightly different with CH (n = 25) being the smallest at 2.3 cm, the value for non-midden deposits in CD (n = 52) is 2.4 cm and the midden deposits in CD (n = 23) are largest at 2.5 cm. CH is a mixed group of contexts and not tightly dated, so further statistical comparison seems inappropriate. The cockles from the two sets of deposits in CD are not statistically different in their length (t-test, two-tailed, p = 0.27).

The numbers of whole winkles was smaller, and the only contexts with sufficient numbers to be worth comparing were the two sets of deposits in CD. The 10 winkles from the non-midden contexts averaged 2.1 cm and the 11 from the midden deposits averaged 2.7cm. This difference is significant (t-test, two-tailed, p = 0.004). A further difference between the two groups was the amount of infestation by *Polydora ciliata*, which had infested 4/10 of the shells from the non-midden deposits and 9/11 of those from the midden, 3 of those being severely infested.

Discussion: The small numbers of whole shells makes interpretation difficult, but it is interesting that there are some differences apparent in the two groups of contexts from phase CD. Cockles are more numerous in the non-midden deposits, although there is no difference in the size of shells from the two groups of deposits. Winkles are equally represented, but the shell from the midden deposits are both larger and show greater infestation by one of the epifaunal species of polychaete worm.

🕮 ■ *Oyster taphonomy; size and shape of shells; age and infestations*

Conclusions

Overall, the marine shell from the 2002 excavations at Fishbourne is not unusual for south-east England in Roman times either in terms of the species composition or in the characteristics of the dominant species, the flat oyster (*O. edulis*). It is unfortunate that it is not possible to compare the material found from the Sussex Archaeological Society's two excavations with the initial excavation of Fishbourne in the 1960s, but marine shell is not mentioned at all in the two excavation reports (Cunliffe 1971 a,b) although there is the implication in the more popular account (Cunliffe 1971c) that it was found in quantity and oyster is described there as a common food which was served in quantity. The material described here, whilst substantial in terms of the amount of oyster shell, is relatively small in quantity compared to a site such as Newport Roman Villa (Winder 1992) where a total of 2159 umbos and whole valves were retrieved, the majority also coming from a midden deposit.

The marine shell assemblage from Fishbourne is consistent with local harvesting of oyster beds, which were clearly not growing as reefs. The size, shape and age range of the harvested shell is consistent with these beds having been managed so that harvesting could be undertaken on a regular basis. The pattern of infesting species indicates that the oysters were growing in shallow conditions.

Although it is difficult to compare data from deposits of very different sizes, it is quite striking that the midden deposits in phase CD do not show many contrasts to the presumably contemporary non-midden deposits from the same phase.

Phase CD is the most species-rich, although since the representation of species other than oyster is quite small, this may simply be a reflection of the overall amount of material. Both of the groups of contexts have a similar representation of the more common species. The oysters from both groups are similar in size and shape, although there may be some greater distortion showing on the left valves from the midden deposits; it is very difficult to be confident where samples of such different sizes are compared and it is quite notable how similar the larger samples of umbos are. The growth patterns of the shells from the two contexts are very similar. Infestation patterns are also broadly similar, with similar overall amounts and species representation. There is some difference in terms of the incidence of *P. hoplura* and *C. celata* infestation of whole right valves, but this does not seem very remarkable in view of the overall similarity. The main difference comes from the age data, where there is a broader distribution and an older modal age for the shell from the midden. This pattern is consistent across both umbos and whole valves.

There are also contrasts in the breakage patterns of the shell and the amount of comminution. This is consistent with a more rapid burial of the oyster midden, resulting in less damage to the shell. A relatively rapid burial is also suggested from the analysis of the animal bone (Sykes *et al*. in this report) however; the other distinctive characteristics of this group of contexts from CD which are evidenced in and argued from the animal bone are not particularly noticeable in the oyster shell. There is no evidence of burning and the equal numbers of right and left valves argues against the shell in the midden deposit being table waste. Since the age-range of the oysters is also at the upper end of modern harvesting practice, this may also indicate that the oysters were less succulent than one would expect for oysters selected to be eaten raw — the habit which is mostly likely to give a distinctive 'table-waste' pattern in the disposal of the shell.

Finally, there is no evidence from the shell to support the hypothesis that all the material in the 'oyster gully' comes from a restricted time-period and probably from the winter. Admittedly, the seasonality of the oysters in the midden deposits have only been assessed indirectly by looking for evidence of restricted harvesting time. However, there was no evidence for that in terms of relative growth of the shell in the last period of the oysters' life before harvesting. Given the lack of modern comparative data in this study, and the general uncertainty about the patterns of shell growth in molluscs (cf. Claassen 1998), this finding cannot be taken as evidence against the seasonality shown by the faunal remains. However, together with the other contrasts with that material, in terms of no evidence for an origin as table waste and no evidence of subsequent burning, separate origins for the shell and the other faunal remains have to be considered when attempting to interpret the site as a whole. In terms of whether the oyster midden as a whole can be regarded as a deposit with any ritual significance, it is perhaps noteworthy that Fulford (2001) does not include any deposits of marine shell in his survey of ritual behaviour in Roman Britain. However, since this survey is,

necessarily, drawn from various excavations which had been carried out during a period of over 100 years, it may be that the omission of marine shell from any descriptions of special or unusual deposits of pottery vessels and animal bone, may simply represents the tendency of past archaeologists to ignore marine shell. Marine shell by itself may often not have any special characteristics in these deposits, as at Chanctonbury (Somerville 2001), but its inclusion in deposits which are also characterized as special may have been of importance.

Note
Full details of all the shell are given in the site archive, together with the analyses described here.

THE ANIMAL BONES

by Naomi Sykes, Claire Ingrem & Judith White
(for Tables 72–83, and Figs 76–88, and the animal bone assessment report *see* 🕮■)

Introduction

Considerable quantities of animal bone were recovered during the 2002 excavations at Fishbourne Roman Palace. The material from the Late Iron Age ditch is considered elsewhere and this report examines the remaining material. A total of 9784 bone and tooth fragments were recovered from a variety of contexts dating from AD 43 to the post-Roman period. When grouped by phase, some of the samples are large enough to permit general analyses of inter-period change in the economy and husbandry practices. But, as most of the material appears to derive from domestic refuse, the assemblage is perhaps more informative about issues of diet. Material from the CD phase of occupation is of particular interest in this respect because it was during this phase that the midden, or 'oyster gully' was deposited. This feature was filled with a good quantity of vertebrate remains, including numerous birds and fish, many of which were burnt: it is a zooarchaeological assemblage unlike any other recovered from Fishbourne to date. Contextual evidence suggests that the gully was filled rapidly, perhaps in a single event. Combined with the presence of at least one pot that has been interpreted as 'ritually killed', it seems possible that the assemblage represents a sacrificial-feasting episode, or at the very least dining waste. This possibility will be assessed by comparing the gully contents with material from the other CD contexts. Beyond this micro-study, the whole assemblage will be considered at a broader scale: the 2002 material will be compared with that recovered from previous excavations at Fishbourne (for instance Grant 1971; Sibun, in Manley & Rudkin 2005a; White n.d.), as well as with assemblages from other sites in the region. Such analyses will help both to build up a picture of how the Palace functioned socially and economically and also to provide an insight into the lifestyle of its occupants.

🕮 Methods and taphonomy

Taxa representation

Composition of the assemblage is shown, by phase, in Table 8, where it can be seen that the hand-collected assemblage is dominated by the remains of the domestic mammals. Of the main domesticates, pigs are the most abundant, followed by sheep/goat, with cattle in third place. Only one specimen (a deciduous premolar) was identified as goat (*Capra hircus*) and it may be assumed that most of the caprine remains were sheep. Whilst wild pigs (*Sus scrofa*) were clearly represented in the assemblage from the 1960s excavations, measurements taken on the 2002 material did not highlight any specimens that could confidently be labelled as wild boar (Fig. 76).

Horse and dog remains are present, in low frequencies in most phases of occupation, and a small number of cat bones were recovered from deposits dating to Phase CD and CH. Metrical analysis of these felid remains suggests that, in addition to domestic cats, wild cats (*Felis silvestris*) are also represented (Fig. 77).

Several other species of wild mammal were identified within the assemblage. Hare (*Lepus* sp.) remains were recovered from the earliest and latest phases of the site, and a single fox (*Vulpes vulpes*) bone was identified from a context dated to Phase CD. Red deer (*Cervus elaphus*) and roe deer (*Capreolus capreolus*) are the most abundant, and are represented in equal numbers. Two fallow deer (*Dama dama*) specimens — an antler fragment from Phase CG and a humerus from phase CH — were also identified. Their presence is highly interesting. It is widely believed that this species was not introduced to Britain before the late eleventh century (Sykes 2004) but these finds add to the growing evidence that a small population of fallow deer were imported and bred at Fishbourne Palace (Sykes *et al*. forthcoming).

Bird bones were found in each of the phased assemblages, being particularly abundant in the CD deposits. In all cases, domestic fowl are the best represented but a wide range of wild species are also present; again most coming from contexts dating to Phase CD. Of the wild birds, the mallard (*Anas platyrhyncos*) is the most abundant but several other duck species — teal (*Anas crecca*), widgeon (*Anas penelope*), pochard (*Aythya ferina*) and goosander (*Mergus merganser*) — are also present in small numbers. These birds must all have inhabited, albeit seasonally, the coastal marshland and mudflats just to the south of the Palace, an environment in which the other marsh-dwelling species — namely the crane (*Grus grus*), moorhen (*Gallinula chloropus*), woodcock (*Scolopax rusticola*), and gull (*Larus* sp.) — would also have been available. A small number of field birds — the redwing (*Turdus illiacus*), an unidentified turdid and some individuals belonging to the pigeon family (*Columba* sp.) — suggests that inland wildfowl were also exploited.

Few Roman sites produce large numbers of fish bones and Fishbourne is no exception. Earlier excavations yielded just a few specimens and, despite an extensive sampling strategy, the area uncovered during the 2002 excavations was largely devoid of fish bones. Context 1098 (Phase CD), however, was unusual in that it produced a comparatively large number (156) of specimens from a surprisingly wide range of species; including herring *(Clupea harengus)*, eel *(Anguilla anguilla)*, whiting *(Merlangius merlangus)*, pouting *(Trisopterus luscus)*, bass *(Dicentrarchus labrax)* and thick lipped mullet *(Crenimugil labrosus)*. In addition, sea bream (Sparidae) and flatfish are also represented. The majority (n = 52) of the bones belong to flatfish (mostly plaice/flounder) although bones belonging to eel (n = 16), bass (n = 15) and mullet (n = 12) are also relatively numerous. The remaining taxa are represented by just a few bones each.

Relative frequencies of the main domesticates

Figures 78a and 78b show the inter-phase variation in cattle, sheep/goat and pig representation, in terms of NISP and MNI.

Table 8. Composition of the assemblage by phase. *hc* = hand collected, *S* = sample.

	CC		CD		CE		CF		CG	CH		Total
	hc	*s*	*hc*	*s*	*hc*	*s*	*hc*	*s*	*hc*	*hc*	*s*	NISP
Mammals												
Cattle	25		152	2	8		32		4	94	1	**318**
Caprine	38	5	251	23	14		32	8	1	129	3	**504**
Sheep	3		7	4						2		**16**
Goat			1									**1**
Pig	77		351	32	32		57	8	10	200	5	**772**
Horse	4		12				2			4		**22**
Dog	1		9							21	1	**32**
Domestic cat			3							3		**6**
Wild cat			1									
Red deer			13		1					7		**21**
Roe deer	1		13	1						6		**21**
Fallow deer							1			1		**2**
Hare	2		10	1						4		**17**
Fox			1									**1**
Cattle-size	82		586	14	32		93	10	11	297	5	**1130**
Caprine-size	197	59	1273	105	70	3	139	188	15	945	29	**3023**
Cat-size	7	38	36	71	3		2	67	1	9	4	**238**
Rat-size		18	2	26				12			3	**61**
Unidentifiable mammal	1	285	232	2104			1	360		17	110	**3110**
Birds												
Domestic fowl	3		104	24			3	10	2	40	3	**189**
Goose			4							2		**6**
Mallard	1		20		1		1			11		**34**
Teal			2	1								**3**
Pochard			3									**3**
Widgeon			2	1								**3**
Mergus			1									**1**
Duck spp.			1	4								**5**
Moorhen			2					1		1		**4**
Woodcock			4	6								**10**
Crane			1									**1**
Gull			1					3				**4**
Pigeon spp.			3							1		**4**
Rock dove												
Redwing				1								**1**
Turdus sp.			1									**1**
Unidentified bird			22	34	1		2					**59**
Fish												
Herring *Clupea harengus*				4								**4**
Eel *Anguilla anguilla*				16				1				**17**
Whiting *Merlangius merlangus*				3								**3**
? Merlangius merlangus				1								**1**
Pouting *Trisopterus luscus*				1								**1**
Sm. Gadidae				3								**3**
?Gadidae				1								**1**
Bass *Dicentrarchus labrax*				15								**15**

Table 8. *(cont.)*

	CC		CD		CE		CF		CG	CH		Total
	hc	*s*	*hc*	*S*	*hc*	*s*	*hc*	*s*	*hc*	*Hc*	*s*	**NISP**
Sea bream *Sparidae*				2								**2**
Thick-lipped mullet *Crenimugil labrosus*				12								**12**
?Crenimugil labrosus				1								**1**
?Muglidae				2								**2**
Muglidae				3								**3**
Flatfish				52				1				**53**
?flatfish				2								**2**
Unidentified fish		1		38								**39**
Total NISP	**442**	**406**	**3124**	**2611**	**162**	**3**	**365**	**669**	**44**	**1794**	**164**	**9784**

Comparison between the two graphs suggests that ranking of the different taxa is influenced by quantification technique: fragment counts show pigs to be the best represented animal in all phases, but sheep/goat are equally well represented when minimum numbers are considered. This slight disparity between the two sets of results is most probably due to inter-species differences in anatomy and age structure. Pigs not only have more anatomical elements than do caprines but, more significantly, they are also frequently slaughtered before they are fully adult, hence a single element may be counted several times as both unfused epiphyses and unfused shaft: in this way, the relative frequency of pigs may be artificially inflated when calculated from fragment counts.

Regardless of quantification technique, both figures show the same overall trends, indicating that cattle became increasingly well represented between Phase CC and CF before their relative frequency fell in Phase CH.

Ageing; Sexing: Skeletal representation; Carcass processing; Animal size 🕮

Contextual analysis

A number of contexts yielded deposits worthy of mention in their own right. For instance, post-hole number 1129 (Phase CC) contained a complete half of a pig skull, whilst a fragment of fallow deer antler was recovered from post-hole number 1068 (Phase CF). Differential preservation could explain the presence of the pig skull (Wilson 1992), although it has been argued that finds of animal heads in pits and post-holes may be evidence for ritual activity (Wilson 1999). The presence of fallow deer antler would fit a ritual interpretation since it is known that fallow deer body parts (in particular antler and foot bones) were traded across the Roman Empire and often incorporated into votive offerings (Sykes 2004). Post-holes containing unusual deposits have been recovered on several Romano-British sites: for instance domestic fowl skeletons have been recovered from post-holes at the sites of Wavenden in Buckinghamshire (Dobney 2001, 43) and Longdoles Field in Gloucestershire (Sykes n.d.). It is not, therefore, beyond the realms of possibility that the Fishbourne examples reflect deliberately placed foundation deposits.

Clearer evidence for inter-context variation came from the Phase CD midden, or the 'oyster gully' (context 1098). During excavation it became apparent that the assemblage from this feature was different in character to the material that had hitherto been recovered from site. It was set apart from other contexts by the quantity of burnt material it contained, and on-site sieving to 10mm highlighted its richness (a considerable number of bird bones, as well as the presence of fish, were noted). On the basis of these observations, the decision was taken to wet-sieve the entire context. As the other deposits on site were not sampled so intensively, inter-context comparisons must be based solely on the hand-collected material, with evidence from the samples being presented and considered separately.

Table 80 shows the composition of the midden assemblage compared to the other substantial contexts from Phase CD: the deposits from above Building 4 and the general southern spreads. Despite the smaller size of the midden assemblage, it contains a greater range of species than the other two deposits. The abundance of fish bones (119 identifiable fragments) is particularly significant; for although the samples are not directly comparable with the wider assemblage it is noteworthy that in all the years of excavation at Fishbourne, just 12 other identifiable fish bones have been recorded. Their absence from the 1960s assemblage can most probably be attributed to lack of recovery: no sampling or sieving was carried out during the original excavations. The same cannot, however, be said of the 1995–2002 seasons in which a systematic sampling system was employed. Fish bones are typically scarce on Romano-British sites and their high frequency within the midden deposit can, therefore, be seen as unusual.

Of the hand-collected material, the midden assemblage is marked by the quantity and range of wild birds it contains: Figure 83 shows that wildfowl remains make up 13% of the midden material compared to just 3% of the other two assemblages. Wild mammals are also slightly better represented than in either the general spreads or Building 4 deposits. An abundance of wild species is not, however, the only trait separating the midden deposit from the other contexts; Figure 83 demonstrates that, in addition, the domesticates are represented in different frequencies. For instance, whilst pig remains dominate the spread and building 4 deposits, the midden assemblage contains a higher frequency of sheep/goat remains. Furthermore, by contrast to the other contexts, cattle are poorly represented in the 'oyster gully' assemblage, with horse and dog being entirely absent. Ageing information also reveals a disparity in the representation of juvenile pigs and caprines, their remains accounting for 9% of the midden material but only 3–4% of that from the other contexts. It should also be noted that the only neonatal mandibles recovered from the site (one lamb and two piglets) were found in the 'oyster gully'.

These inter-context variations in both taxa and age range suggest the midden assemblage is unusual. The possibility ex-

ists, however, that its apparent difference may simply be the product of the assemblages' depositional history. It has been shown repeatedly (for instance Wilson 1996) that the bones of fish, birds, and small or juvenile mammals are more likely to both survive and be recovered when deposited in discrete and protected features, such as the 'oyster gully'. By contrast, material placed in exposed spreads is more susceptible to destructive processes and, typically, only the more robust specimens (for instance adult bones and those from larger mammals) survive.

The superior preservation of the midden assemblage may well account for its contents (the presence of fish, bird and neonatal remains), but it also suggests that the material was deposited and buried rapidly, thus avoiding the effects of weathering or trampling. There are several other reasons to suspect this was the case. For instance, on one occasion it was possible to refit bones recovered from the top and bottom spits of excavations which, together with the general homogeneity of the assemblage, suggest that the gully was filled in a single event rather than episodically. The range of wild birds represented in the midden deposit also indicates a restricted depositional period: the widgeon, goosander, redwing and woodcock are today migratory species and, in all probability, were caught, consumed and deposited at Fishbourne during the winter months. By contrast, the species represented in the other deposits are available in modern-day England all year round, with the exception of the crane which is, today, a summer visitor.

It may, therefore, be concluded with some certainty that the midden assemblage was deposited within a limited timeframe, but from what activities does it derive? In general, assemblages containing high frequencies of bird, fish and medium-sized mammal remains are thought to be indicative of food remains, rather than coarse domestic or butchery waste (Wilson 1996). The avian body part data support a table-waste interpretation, showing as they do an abundance of meat-bearing elements with an almost complete absence of the extremities, elements most probably removed during primary butchery. The mammalian and fish remains show less clear anatomical patterning, but the presence of human gnawing on some of the specimens, in particular piglet and fish bones, suggests that these remains too are derived from meals. As such, of all the contexts recovered during the excavations at Fishbourne, the midden deposit may provide perhaps the best indication of the diet and consumption practices of the Palaces' inhabitants.

Discussion and conclusion

It has long been recognised that animal bones can reveal much about past economies and husbandry regimes, and certainly the Fishbourne assemblage has the potential to inform on these issues. In addition, the value of zooarchaeology for providing evidence on social phenomena is now also being recognised, and we should look to the Fishbourne assemblage for information concerning the thoughts and beliefs of the sites' inhabitants. Before this can be achieved, it is necessary to consider what the Fishbourne assemblage represents and what it can reveal about the nature of settlement between AD 43 and the end of the Roman period. The first thing that may be noted is that, despite slight inter-period shifts, there is no significant change in the assemblage's composition through time: for each phase the taxa representation, ageing and body part data show similar patterns. This suggests some degree of continuity in both disposal practices and the character of the area from which the material derived.

It must be borne in mind that the 2002 excavations uncovered just a tiny fraction of the overall palace complex and the animal bone assemblage is, therefore, equally restricted, providing a mere snapshot of the settlement's activities. That the assemblage does not reflect the complete picture is indicated by the general lack of 'coarse debris'; that is, the remains of non-food animals — horse, dog and cat, which were not usually eaten within the Roman Empire (Grant 1989, 145; Maltby 1994, 89) — and primary butchery waste. Primary butchery waste, in particular cattle and caprine cranial elements, was also under-represented in the 1960s assemblage and it could be argued that the settlement was provisioned with partially dressed carcasses. It seems more likely, however, that these skeletal elements were discarded, together with the cadavers of the non-food animals, towards the peripheries of the settlement: excavations 200 m to the east of the palace certainly produced an assemblage dominated by this kind of coarse debris (Ingrem n.d).

The overriding impression provided by the 2002 material is that it is composed predominantly of domestic rubbish, or more specifically dining waste. This interpretation is supported by the marked under-representation of extremities in the avian assemblage. Unlike large mammals, the primary butchery of bird carcasses is traditionally a kitchen activity and thus general domestic waste will often contain extremities and meat-bearing elements in roughly equal quantities. The almost complete absence of carpometacarpi and tarsometatarsi in the 2002 assemblage suggests that kitchen waste is absent. Instead, since most of the bird bones derive from the meat-bearing part of the carcass, it may be assumed that the 2002 avian assemblage is composed of portions that were served at the table. Combined with the evidence for human gnawing (the crushed fish and piglet bones), there is a strong case for suggesting that the assemblage uncovered during the 2002 excavations represents the remains of meals.

Because the assemblage is apparently of domestic origin, it is difficult to ascertain from it whether the settlement was a producer site, self-sufficient, or provisioned from outside. Had animals been bred on-site it seems unlikely that the carcasses of infant mortalities would have become incorporated with household rubbish, instead being disposed of, along with the other coarse debris, at the outskirts of settlement. Neonatal animals are present in the assemblage, but they clearly represent individuals that were eaten (often showing cut marks or even evidence for human gnawing) and could have been imported or raised at the settlement. Of the main domesticates, the data for pigs are perhaps the most suggestive of on-site breeding: the dental ageing evidence shows the presence of both neonates and adult animals. When compared to the cull patterns for the nearby sites of Batten Hanger and Watergate Hanger (self-sufficient villas analysed by Hunter n.d) and the urban assemblage from Chichester (consumer site — Levitan, 1989) it can be seem that the 2002 assemblage contains a much higher frequency of adult animals and fewer prime-aged individuals than the other assemblages (Fig. 84). This would seem to suggest that pigs were not only being raised at Fishbourne but that the prime animals were also being exported. Herein lies the danger of basing an interpretation on a small sample, for when the 2002 material is viewed in conjunction with the data from the previous excavations a much more balanced pattern emerges. Figure 85 shows that the 2002 material

is not representative of the site so far excavated; overall there are many more prime-aged animals, a situation much more indicative of a self-sufficient site.

In contrast to pigs, ageing data for the 2002 cattle and caprines show a more restricted age range. The cull-patterns for cattle suggest that Fishbourne was provisioned: similar to the 1960s and 1990s assemblages, the majority of individuals were fully adult and must have been utilized elsewhere for their secondary products before being brought, most probably on-the-hoof, to the palace. In the case of caprines, the 2002 assemblage contains few old animals and is dominated by individuals slaughtered between 1 and 3 years of age (Stages D and E). Viewed in isolation, this ageing data is strongly indicative of a settlement provisioned with prime meat animals. Evidence from the other areas of excavation is, however, less conclusive. Figure 86 shows the dental ageing data for all the Fishbourne assemblages combined, and the resulting cull-pattern has affiliations with those from settlements involved in sheep husbandry.

Similar to the ageing data, the taxonomic composition of the 2002 assemblage is also slightly different to that of the 1990s and 1960s material. It contains markedly fewer cattle bones and the percentage of wild mammals and domestic birds is lower; there is, however, a higher frequency of pigs, sheep/goat and wild bird remains than is apparent in the other assemblages. These variations are likely to reflect differences in context and depositional history. The report for the 1995–99 excavations, for instance, indicates that the assemblage derived from a wide range of activities, including the dumping of primary butchery waste and the carcasses of non-food animals (Sibun 2005). The 'finer' nature of the 2002 material, that it contains greater quantities of pig and caprine bones, is consistent with the idea that the 2002 material derives almost exclusively from kitchen and dining waste.

Despite the inter-assemblage differences, overall the 2002 material is very similar in character to that from the earlier excavations, especially when compared to other sites in the region (Figs 87 & 88). Indeed, in terms of its taxonomic composition the Fishbourne assemblage is unlike any other in southern England — no other sites have yielded such high frequencies of pigs, domestic birds or game animals. Indeed, so extraordinary is the assemblage from Fishbourne that, by comparison, the marked differences between assemblages from farmsteads, urban sites and villas appear negligible. As the Fishbourne material is so obviously different to all other assemblage types, suggesting a site that operated outside the normal provisioning system, the amount of information it can yield about the local day-to-day economy must be minimal. That said, the 2002 material does exhibit some inter-period shifts that conform to wider patterns of change. The temporal increase in cattle frequency is a nationally recognised trend, which has been linked to economic intensification (Grant 1989; Hamshaw-Thomas 2000). Also well known is the increase in animal size (as indicated by the sheep/goat metrics: Table 83), thought to have resulted either from the importation of continental breeds or the improvement of native stock (Dobney *et al*. 1995). Of greater interest, however, is the information that the 2002 assemblage provides about the trade and processing of fish.

Given the size of the fish bone assemblage, the number of different taxa present in the sample is quite surprising. All are known to inhabit estuarine waters (Wheeler 1969; 1979) thereby suggesting low-intensity exploitation of the estuary nearby. Flatfish, being by far the most numerous, may have been specifically targeted, other fish perhaps incidental catches. The recovery of a few bones from the skull and appendicular region indicate that eel, bass and flatfish were originally present as whole fish and it is likely that so too were most of the other taxa. It is not possible to determine whether the fish arrived at the site in a preserved or fresh form although their generally small size raises the possibility that some represent a local version of garum and/or *hallec*. The Romans are well known for producing a fish sauce, known as garum, from decomposed fish (usually clupeids) that was stored in amphorae (Wheeler & Locker 1985; Bateman & Locker 1982). Pliny (in Flower & Rosenbaum 1980) provides many recipes for garum and advocates the use of 'any small fish', including a recipe for 'homebrew' that involves boiling the fish and brine in an earthenware pot until it has reduced, after which the liquid is strained off as garum. The remaining *hallec* (solid residue containing the bones) was apparently, also valued.

Evidence for provincial sauce production has been recovered from London (Bateman & Locker 1982) and York (Jones, 1988) whilst at Lincoln, it has been suggested (Dobney *et al*. 1995, 54–5) that concentrations of sand eels and small clupeids in late Roman contexts may be evidence for local production. The identification of garum in the archaeological record is usually associated with large quantities of fish bones and the amphorae used for storage, however a small sample recovered from late Roman deposits at Silchester Insular IX (Ingrem n.d.) suggests consumption of a local variety of garum. The sample from Silchester is comprised mainly of very small fish, mostly eel with a variety of other species, including clupeid, recovered from a group of cesspits. This led to the suggestion that a type of fish sauce composed of locally available species may have been manufactured at a seaport or estuary town and imported to inland cities such as Silchester (Serjeantson pers. comm.).

The bones of medium and large size fish, such as the eel, bass, and flatfish would be extremely difficult to swallow, therefore it is unlikely that whole fish of this size would be used to make fish sauce. Their remains are more likely to represent the occasional consumption of locally caught fresh fish. A few fish remains have been recovered from other areas of Silchester, the Period 7 deposits at the Forum-Basilica produced cyprinid, bass, sea bream, mullet and flatfish whilst in the later third- to fourth-century deposits (Hamilton-Dyer 1997) salmonid, sea bream and ballanwrasse were identified. Here, apart from the cyprinids, all may have been caught in the sea, probably the east or south-east coast (Hamilton-Dyer 2000), and imported fresh to Silchester. Fish have been recovered from several other Roman sites in the south of England, both urban and rural settlements, including Dorchester Greyhound Yard (Hamilton-Dyer n.d), Dorchester County Hall (Hamilton-Dyer 1993), Exeter (Wilkinson 1979) and Ower, Dorset (Coy 1987). Large concentrations of fish bones are however, rare, and most of the remains belong to fish that generally inhabit inshore waters suggesting that fishing was not well organized at this time and that fish was not regularly consumed.

The fact that fish were eaten at Fishbourne, even on an occasional basis, demonstrates how varied the occupants' diet must have been. It was far from the mundane fare consumed by the general Romano-British population, but was also markedly different from the Iron Age diet, in which fish and other wild animals were almost entirely absent. In this way the Fishbourne assemblage can be seen as reflecting the identity of the site's

inhabitants, which is unsurprising since diet is not simply the product of biological need but is socially and culturally determined. The assemblage, dominated by food waste, in particular the material from the midden, affords us therefore, a real insight into the social life of the palace's occupants.

At its most basic, the 2002 assemblage can be labelled as 'Romanized'. As has been noted above, wild mammals and wildfowl are scarce on Iron Age and 'native' Romano-British sites, so too are the remains of domestic fowl. Indeed, it has been suggested that all of these animal groups may have been subject to dietary taboos during the Iron Age (King 1991, 18). Another indication of the assemblage's Romanized character is provided by its high frequency of pig bones, a commonly cited trait of Mediterranean dietary preferences (King 1978). Certainly Galen believed that of all the meats, pork was the most nutritious (M. Grant 2000, 154), and Appicus' recipe books mention pork more than any other meat (Alcock 2002 35). Sucking pig in particular appears to have been considered a delicacy across the Roman Empire and the presence of human-gnawed piglet bones in the 2002 assemblage confirms that it was on the menu at Fishbourne. It would seem, however, that consuming large quantities of pork was as much a mark of social status as it was of ethnic identity. For instance, pig bones have been found in high frequencies at several Iron Age sites, including Silchester in Hampshire (A. Grant 2000), Skeleton Green in Essex (Ashdown & Evans 1981) as well as in Fishbourne's Iron Age ditch (Sykes 2005). Although all of these sites demonstrate strong links with Roman world, they need not have witnessed true Roman occupation. Instead, they reflect how the Iron Age elite adopted aspects of the Mediterranean lifestyle in order to enhance their own social standing (*see* also van der Veen forthcoming).

In strongly stratified societies, such as that of Roman Britain, elite diet (or 'higher cuisine') often contains ingredients from 'outside' (Goody 1982, 44). In the case of Fishbourne the presence of a fallow deer humerus is clear evidence of how meat from exotic animals was consumed as a luxury food. Concepts of 'luxury' are, however, culturally relative. Luxury ingredients are not always imported but, as van der Veen (2003, 420) has argued, they are those foods deemed extravagant and unnecessary by any given society. By comparing the Fishbourne assemblage with those from other sites in the region (Figs 87 & 88) it is abundantly clear how exceptionally 'luxurious' food at the palace must have been. In a period when the meat requirements of most people were met through the consumption of domestic mammals, in particular cattle and caprines, the occupants of Fishbourne were consuming considerable quantities of 'unnecessary' foodstuffs, notably those derived from wild animals. It must be assumed that the incorporation of birds, fish and game into the diet would have been accompanied by new forms of etiquette and dining practices: social graces employed to enhance further feelings of exclusivity.

Consumption of wild resources should not be viewed in isolation from the process of hunting and game distribution, since all are linked and socially meaningful. Increasingly it is being recognised that, within farming societies, hunting is employed by elite groups to communicate power, authority and often land ownership (for examples *see* Kent 1989; Hamilakis 2003; Sykes forthcoming). The high frequency of wild animals represented in the Fishbourne assemblage, compared to those from other site-types, would appear to support the idea that hunting was a socially divisive activity in Roman Britain, rather than simply a risk-buffering strategy (as has been argued by Grant 1981; 2002). Almost by definition, hunting would have been a ceremonial affair and it seems likely that the kill and division of the carcass would have been equally ritualized. Some evidence for this is provided by the body part patterns for the red deer. The over-representation of hind-limb bones and absence of elements from the forelimb — a pattern also observed for the 1960s assemblage (LAZOR data base) — suggests that carcasses were divided in the field and only the choice portions brought back to the palace, other cuts possibly being gifted to lower-ranking participants of the hunt.

Wildfowling also appears to have been an activity primarily of the elite: Figure 88 shows that wild birds are poorly represented on farmstead and urban sites, proportionally better represented in assemblages from villas, but comparatively numerous at Fishbourne. Contextual evidence points to the seasonality of their exploitation; the 'oyster gully' assemblage contains a considerable number of migratory birds, but a dearth of the more mundane species such as the mallard, which is well-represented in the other contexts. The species representation for the midden suggests that, for the meal(s) this deposit represents, particular birds were specifically targeted for consumption. The fact that many of the species are winter visitors raises the possibility that the deposit derives from a single meal, perhaps a seasonal feasting event. The 'special' nature of the midden context, that it contains such a high frequency of luxury foodstuffs (fish, wildfowl and game) certainly gives credence to the argument. Add to this its relatively high frequency of neonatal sheep and pigs, as well as the burnt nature of the deposit, and the midden assemblage begins to show affinities with sacrificial-feasting deposits (for instance Powell 1995–96; Hamilakis & Konsolaki 2004). Without further research this can be only a tentative conclusion, but it will be interesting to see whether the other categories of finds support the interpretation.

The animal remains from the 2002 excavations have provided a substantial amount of information to assist the characterization of the Fishbourne site. At the same time, analysis has highlighted how varied material from different areas of excavation can be, which, if viewed in isolation, could lead to misinterpretation. In order to gain a real understanding of the site, it is necessary to adopt a more holistic approach and to examine all the animal bone as a single assemblage, rather than as a collection of disparate units.

🕮 The animal bone assessment report

THE CHARRED PLANT REMAINS by Ruth Pelling
(for Table 84 which provides identification by sample number and context *see* 🕮)

Introduction

Throughout the 2002 excavation season of the area to the north of Building 3, bulk samples were taken for the extraction of charred plant remains. Samples were processed on site using a floatation machine and flots collected on to 0.25 mm and 1mm meshes. Dried flots and charred remains recovered from the 1 mm residue were submitted for analysis. The purpose of the sampling was to extend the programme from previous seasons in order to attempt to expand the knowledge of diet of the inhabitants of the area and to gain an insight in to the supply, processing and disposal of crops on the site.

Table 9. Charred plant remains by phase.

	Phase	CF	CE	CD	CD	CD	CC3	CC2	CC2	CC1	CC1	CA1	Unknown
	Sub-phase	Flint post- holes	Rubbish pit	Gen. S. spreads	Oyster gully	Northern pits	3rd-phase gullies	2nd-phase gullies	Timber buildings	Post-holes	1st-phase gullies	early ditch silts	Midden deposit
	Number of samples	9	1	1	19	3	1	3	2	6	4	6	4
Triticum spelta	Spelt wheat grain	-	-	-	7	-	1	-	-	-	-	-	-
Triticum spelta/dicoccum	Spelt/emmer wheat grain	-	-	-	4	-	-	-	-	-	-	-	-
Triticum sp.	*Triticum* grain	1	-	-	4	-	-	-	2	2	-	-	-
Hordeum vulgare	Barley, hulled grain	3	-	-	14	1	-	-	2	2	-	4	-
Avena sp.	Oats grain	-	-	-	-	-	-	-	-	-	-	1	-
Cerealia indet.	Indeterminate grain	1	-	1	6	1	-	1	-	4	-	-	1
Triticum spelta	Spelt wheat glume base	-	-	-	-	2	-	1	-	-	-	-	-
Triticum spelta/dicoccum	Spelt/wheat glume base	1	-	-	1	-	-	1	-	-	-	-	-
cf. *Vicia faba*	Celtic bean	-	-	-	-	-	-	-	1	-	-	-	-
cf. *Lens culinaris*	Lentil	-	-	-	-	-	-	-	-	-	-	-	-
Vicia/Pisum sp.	Bean/Pea	1	-	-	2	-	-	-	-	1	-	-	-
Corylus avellana	Hazelnut shell	1	-	-	1	2	-	-	-	-	-	-	-
Rumex sp.	Docks	-	-	-	4	-	-	-	-	-	-	-	-
Vicia/Lathyrus sp.	Vetch/Tare	-	-	-	3	-	-	-	4	-	-	-	-
Schoenoplectus sp.	Club rush	-	-	-	1	-	-	-	-	-	-	-	-
Gramineae	Grass, small seeded	-	-	-	1	-	-	-	-	-	-	-	-
Indet.		-	-	-	1	-	-	-	-	-	-	-	-
Charcoal		+	+	+	++++	+	+	+	++++	+	+	++++	+

Methods

Each flot was scanned under a binocular microscope at ×10 magnification. Any charred seeds or chaff were identified and counted. Identifications were based on morphological criteria and by comparison to reference material held by the author. Charcoal greater than 1 mm was quantified on the basis of present, common, frequent or abundant. The presence of *Quercus* sp. (oak) or non-*Quercus* wood was noted. A summary of the results is shown by phases and sub-phase in Table 9. Nomenclature and taxonomic order follows Clapham *et al*. (1989).

Results by phase

Discussion

Charred cereal grain was present in a number of samples, although always in small numbers. Weeds and chaff were very rare and all the chaff identified consisted of wheat glume bases. It would appear that cereal processing activities were not taking place in this area of the palace and therefore the waste products (chaff and weeds) were not entering the deposits. It is of interest to note that no mineralized seeds were present which might be expected in midden deposits where calcium and phosphates are often present. This might suggest that little organic matter was reaching the midden deposits other than the oyster shell, or that decomposition was rapid. The small amounts of cereal remains which are present are likely

to represent background scatters of material present in the soil across the site.

The crop remains that are present are dominated by cereal grains. Barley and spelt wheat are represented while oats were identified in one of the pre-conquest deposits. Barley and spelt are the principal cereal crops recorded on Iron Age and Roman sites across southern Britain (Greig 1991; e.g. Campbell 2000), and have both been recorded in previous work at Fishbourne. Pulses were also recorded and include a common British pulse, Celtic or field bean, as well as a possible lentil which is more likely to be an imported product. Lentil has previously been recorded from the 1995–99 excavations and has also been recorded from Roman London (Straker 1984). Such imports perhaps hint at a luxury diet.

Charcoal is particularly common in the early ditch silts, the oyster midden and the timber building (context 1066). This last context is dominated by oak charcoal and it is tempting to suggest that structural timbers are represented. In the other samples the charcoal may derive from dumps of firewood.

While the sampling from the area to the north of Building 3 has not produced flots rich in charred remains, it is significant that there is no evidence of cereal-processing or disposal in this area despite the number of middens. The range of crops that are present complements those of previous excavations at the site (Carruthers 1992).

POLLEN by Rob Scaife

Introduction

During the excavations of 2002 a range of features in Area C were sampled for environmental analysis. These included ditch, midden and pit contexts from which soil monolith profiles were taken for pollen analysis. Earlier analyses of samples from the Flavian palace by Greig (1971) demonstrated that pollen could be recovered from the site and thus, there was potential for expanding our data on the local vegetation and environment of the site during the different phases of occupation. One of the principal aims was to establish the environment within and adjacent to the early linear ditch. As with the pollen study by Greig, a further aim was to look for evidence of exotic introductions, especially from formal gardens, although this would be more likely to relate to the later Flavian palace. Sub-fossil pollen and spores have been recovered in varying degrees of preservation and absolute numbers from contexts which span the earliest phase (primary ditch silts) to the midden samples of second century date. As with earlier studies, however, no evidence of exotic introductions or garden plants has been recovered in this study. Useful information has, however, been gained on the vegetation environment in proximity to the site.

🕮 Pollen method; 🕮 Pollen data

Conclusions and proposed additional research

Pollen has been recovered from a range of different contexts of different ages (Table 86). Although there is strong evidence of differential preservation in samples from some contexts, all of the data indicate an open grassland environment with no woodland in proximity to the site. Numbers of cereal pollen and associated weeds are small, which is surprising, especially for the midden deposits where waste domestic material is present. Absence here does not, however, preclude importance in other contexts. The most useful data come from the basal (grey) sediment fills of the early linear ditch. Here pollen preservation was generally fair, demonstrating that the surroundings were grassland whilst the ditch itself was wet, supporting marsh-type taxa (also including a proportion of the grasses noted). No evidence of exotic, introduced garden or horticultural plants was found. This is perhaps not surprising as formal gardens are associated with the late (Flavian) palace and pollen from many possible plants (e.g. box and laurel) are poorly represented in pollen spectra.

Pollen preservation and the complex taphonomy in such contexts such as the ditches and pits examined here pose problems in interpretation especially from small numbers of isolated samples. It is hoped that additional work will be carried out on the basal fills of the early linear ditch where pollen preservation was satisfactory. Samples should be analysed sequentially through the basal grey sediments of the primary fill at a number of locations along the length of the feature. This would characterize the habitat and land-use in greater detail.

Furthermore, the better preservation of pollen in the basal fills of the linear ditch demonstrates that useful pollen data can be gained from this site. Consequently, attention will be given in future to similar contexts within other features and also from any old land surfaces (palaeosols) which are identified. From the off-site zone, there is potential for analysis of longer sediment profiles from the nearby salt marshes and sediments along the line of the adjacent stream. It is hoped that these longer-term studies will provide information on the accessibility of the site in relation to sea level and a longer-term vegetation sequence, which would place the Roman developments in a model of the changing prehistoric and historic landscape.

GENERAL CONCLUSIONS

Given that this is the final report on the excavations by the Sussex Archaeological Society between 1995–99, and again in 2002, it seems pertinent to stand back and review the overall results.[6] Undoubtedly, there are two main revelations that grab the attention. The first concerns the discovery of the first demonstrable, well-dated Late Iron Age feature at Fishbourne — the length of pre-conquest ditch. Prosaically described in that last sentence it is, of course, not just any old ditch. Its well-sealed contents, incorporating a beguiling mixture of imported and local ceramics, an informative animal bone assemblage, and last but not least the tantalising ornament for a legionary scabbard — all apparently dated to a generation before AD 43 — offer up a kind of archaeological text from which can be read a whole series of proto-historical sub-plots. And, of course, the fact that so little of this ditch has been excavated, and that even the whereabouts of the terminals of the ditch are unknown, or if the

ditch joined other ditches to make an enclosure or enclosures, leaves us only speculation as a guide between the conceivable interpretations. There is also the notable matter of the apparent gap in the ceramics between approximately AD 25 and AD 43; whatever plot was enacted inside that ditch, it was a plot that was somehow truncated.

However, having presented the evidence of and from the ditch, eschewing the caveats we can tempt our untrustworthy and speculative guide to inveigle us with just a couple of glimpses of what might have been. The mixture of high-status imported ceramics and locally produced wares suggest significant contact between the Roman continent and southern Britain. But did this contact take place in Gaul, with British traders returning laden with imperial exotica jealously sought after by local chiefs, or did Gallic sailors or Roman *negotiatores*, soldiers even, sail up the Fishbourne channel and drop anchor? There is just no way of knowing at present. Since the ditch must have enclosed, or at least, demarcated something, what kind of something was that? Was it the fabled Palace of Tincomarus or Verica, a client king supported by the power across the water? Was it a central place of the almost just as fabled *oppidum* in the area defined by those enigmatic so-called Chichester dykes? Was it an entrepot, an alien outpost of Rome, replete with imperial commodities, patrolled and guarded by soldiers, gifting, exchanging, bartering, trading with a local populace bewitched by the enchantment of unimaginable artefacts? Or was it none of those things but something else, something as yet inconceivable, something beyond the limited parameters of our current understanding? The temptation to imagine further is almost overwhelming. However, our guide at this point shrugs his shoulders — time to take refuge in a more founded representation of the past at Fishbourne.

The second major discovery of our excavations concerns the amount of activity right in front of the Roman Palace. Four buildings, or parts of buildings, have been revealed which faced the northern part of the eastern façade of the Palace (Fig. 34). In truth, the earliest one, the furthest to the north, had disappeared by the time of the construction of the Palace. But the other three (Buildings 3 and 4, and the timber building between them) did 'Face the Palace'. We do not wish to repeat here what we have already stated regarding the functions of these buildings (Manley & Rudkin 2005a). We really do have nothing to add. Except the realization that the Palace at Fishbourne was probably only a Palace for the twilight years of Togidubnus, however long that enjoyable dusk may have been. There are enough indications that, certainly by the middle of the second century AD, the architectural integrity of the original Palace design had been so compromised by partial demolitions and refurbishments, that 'Palace' may no longer have been a suitable description. It was still a place of some status, and of considerable activity, but Fishbourne had become a landscape of probably separate, smaller buildings. Even speculation, faced with these conundrums, fails to provide any illumination whatsoever at this juncture. We simply do not know what second-century Fishbourne was really about.

There is a sense that our reconstructed story of Roman Fishbourne has come a long way since that act-of-discovery pipe-trench[7] crashed through the foundations of the North Wing of the Palace in 1960. The 1960s excavation revealed the magnificently obvious — the layout of a Roman Palace that stood comparison with the best Rome could offer in terms of architecture, furnishings and fittings. There is still vast quantity of work required to set the Palace into its environmental and geographical contexts; the Palace must have had an estate, even a deer-park, but the location of such things is unknown. It is to these less magnificent but equally intriguing stories, some chronologically either side of the Palace, that work in the twenth-first century must also turn. The construction of the Palace fossilized a whole sequence of developments that may or may not have had relevance to the later Palace — these need to be painstakingly investigated, commencing with the pre-conquest ditch. And we need to understand what the Palace metamorphosed into during the second century, and what role it played in the wider Roman political schema in the land of the Regni. So much for '*Facing the Palace*'; '*Under the Palace*' and '*After the Palace*' remain, at least for the time being, books in search of authors.

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NOTES

[1] Two discrete areas of the trench remained unexcavated: the north-west corner of the trench (because excavating there would not have provided information relevant to our two aims) and the area within Building 4.

[2] Please note that in this report bulk finds will only be commented upon if they add significant new dimensions to the repertoire of finds from any feature, complex of features or phase. Note also that it is a given that all finds are fragmentary. Where this does not apply, as in complete artefacts, this will be mentioned in the text.

[3] Indeed, since so little of Building 4 was situated within Area C, little attempt was made to excavate the deposits inside the building, on the assumption that they would be better left to excavate when more of the ground plan of the building could be revealed.

[4] Building 3 measured some 21 m north–south by 35 m east–west.

[5] *The Oxford Dictionary of Quotations* 1986, p. 259.

[6] It seems unlikely that these words will be the final words on our excavations, however. Because Fishbourne is a celebrated site in Roman Britain, and because we have made available through ADS much of the primary data from our excavations it is highly probably that our data will be re-worked and perhaps alternative interpretations will emerge. The authors are indeed confident that that datasets provided on Fishbourne through ADS will produce alternative and additional narratives to those we have articulated.

[7] See Manley and Rudkin (2005a, 1) for the story of the discovery of Fishbourne Roman Palace.

REFERENCES

Adam, J. P. 1994. *Roman Building: Materials and Techniques*. London: Batsford.

Alberalla, U., Dobney, K. & **Rowley-Conwy, P.** forthcoming. Size and shape of the Eurasian wild boar (*Sus scrofa*), with a view to the reconstruction of its Holocene history.

Alcock, J. P. 2002. *Food in Roman Britain*. Stroud: Tempus.

Allen, D. 2002. Roman window glass, in *Artefacts and Archaeology: Aspects of the Celtic and Roman World*, eds M. Aldhouse-Green & P. Webster. Cardiff: University of Wales Press, 102–11.

Allen, D. F. 1960. The origins of coinage in Britain: a reappraisal, in *Problems of the Iron Age in Southern Britain*, ed. S. S. Frere. Occasional Paper **11**. London: Institute of Archaeology, University College London, 97–308.

Allen, J. R L. & **Fulford, M. G.** 2004. Early Roman mosaic materials in Southern Britain, with particular reference to Silchester (Calleva Atrebatum): a regional geological perspective, *Britannia* **35**, 9–38.

Arthur, P. & **Williams, D.F.** 1992. Campanian wine, Roman Britain and the third century AD, *Journal of Roman Archaeology* **5**, 250–60.

Ashdown, R. & **Evans, C.** 1981. Animal bones, in *Skeleton Green: a Late Iron Age and Romano-British Site,* ed. C. Partridge. Britannia Monograph Series **2**. London: Society for the Promotion of Roman Studies, 205–35.

Barber, L. 2005. The ironwork, in *Excavations at Fishbourne 1995–99*, by J. Manley & D. Rudkin,

Bateman, N. & **Locker, A.** 1982. The source of the Thames, *The London Archaeologist* **4**(8), 204–7.

Bean, S. C. 2000. *The Coinage of the Atrebates and Regni*. Oxford: Oxford University School of Archaeology.

Bendrey, R. in press. The identification of fallow deer (*Dama Dama*) remains from Roman Monkton, the Isle of Thanet, Kent, in *Materials of Manufacture: the Choice of Materials in the Working of Bone and Antler in Northern and Central Europe During the 1st Millennium AD*, ed. I.D. Riddler. BAR International Series. Oxford: BAR.

Bennett, K. D., Whittington, G. & **Edwards, K. J.** 1994. Recent plant nomenclatural changes and pollen morphology in the British Isles, *Quaternary Newsletter* **73**, 1–6.

Bird, J. (ed.), 1998. *Form and Fabric: Studies in Rome's Material Past in honour of B. R. Hartley*. Oxbow Monograph **80**. Oxford: Oxbow.

Bishop, M. C. & **Dore, J. N.** 1988. Corbridge. *Excavations of the Roman Fort and Town 1947–80*. London: English Heritage.

Black, E. W. 1987. The Roman Villas of South-East England. BAR British Series **171**. Oxford: BAR.

Boessneck, J. 1969. Osteological differences between sheep (*Ovis aries* Linné) and goat (*Capra hircus* Linné), in *Science in Archaeology*, eds D. Brothwell, E. Higgs & G. Clark. 2nd edition. London: Thames and Hudson, 331–58.

Brain, C. K. 1967. Hottentot food remains and their bearing on the interpretation of fossil bone assemblages, *Scientific Papers in the Namib Desert Research Station* **39**, 13–22.

British Museum. 1964. *Guide to the Antiquities of Roman Britain*. 3rd edition. London: British Museum.

Bullock, A. E. & **Jones, A. K. G.** 1998. Dispersal of fish waste, *Internet Archaeology* **4**.
Bushe-Fox, J. P. 1932. *Third Report on the Excavations of the Roman Fort at Richborough, Kent*. London: Society of Antiquaries.
Butler, C. 2005. The prehistoric flintwork, in Facing the Palace,by J. Manley & D. Rudkin, *Sussex Archaeological Collections* **141**, 15–16.
Campbell, G. 2000. Plant utilization: the evidence from charred plant remains, in *The Danebury Environs Programme: the Prehistory of a Wessex Landscape*, vol. **1**, by B. Cunliffe. Oxford: University School of Archaeology Monograph, 45–59.
Carreras, C. 2003. Haltern 70: a review, *Journal of Roman Pottery Studies* **10**, 85–92.
Carreras, C. & **Williams, D. F.** 2002. Carrot amphorae: a Syrian or Palestinian connection?, in *The Roman and Byzantine Near East*, vol. 3, ed. J. H. Humphrey, *Journal of Roman Archaeology* Supplementary Series no. **49**, 133–44.
Carruthers, W. 1992. *Fishbourne Roman Palace, West Sussex: Carbonised Plant Macrofossils from Garden Features*. Ancient Monuments Laboratory Report New Series **130/91**.
Castle, S. A. 1974. Excavations at Brockley Hill, Middlesex, March–May 1972, *Transactions of the London and Middx Arch. Soc*. **25,** 251–63.
Cerón-Carrasco, R. 1999. The fish bones, in *Between Land and Sea: Excavations at Dun Vulan*, eds M. Parker Pearson, N. Sharples, J. Mulville & H Smith. Research vol. **3**. Sheffield: Sheffield Academic Press, 234–74.
Charlesworth, D. 1975. A Roman cut glass plate from Wroxeter, *Antiquaries Journal* **55**, 404–6.
Ciarallo, A. & **de Carolis, E.** 1999. *Homer Faber Natura, scienza e tecnica nell'Antica Pompeii*. Milano: Electa.
Claasen, C. 1998. *Shells*. Cambridge: Cambridge University Press.
Clapham, A. R., Tutin, T. G. & **Moore, D. M.** 1989. *Flora of the British Isles*. 3rd edition. Cambridge: Cambridge University Press.
Clegg, S. 2005. Blue frit, in A pre-AD 43 ditch at Fishbourne Roman Palace, Chichester, by J. Manley & D. Rudkin, *Britannia* **36**, 78.
Cohen, A. & **Serjeantson, D.** 1996. *A Manual for the Identification of Bird Bones from Archaeological Sites*. Revised edition. London: Archetype Press.
Cool, H. E. M. & **Philo, C.** 1998. *Roman Castleford: Excavations 1974–85*, vol. **I**: *The small finds*. Wakefield: West Yorkshire Archaeology Service.
Coy, J. P. 1987. The animal bones (Ower), in *Romano-British Industries in Purbeck: Excavations at Ower*, by P. J. Woodward. Dorchester: Dorset Natural History & Archaeology Society, monograph, Series **6**, 114–18.
Crawford, M. H. 1974. *Roman Republican Coinage I*. Cambridge: Cambridge University Press.
Crummy, N. 1983a. *The Roman Small Finds from Excavations in Colchester 1971–9*, Colchester: Colchester Archaeological Trust.
— — 1983b. *Colchester Archaeological Report* **2**. Colchester: Colchester Archaeological Trust, 71, fig. 74.
Cunliffe, B. 1968. *Fifth Report on the Excavations of the Roman Fort at Richborough, Kent*. London: Society of Antiquaries.
— — 1971a. *Excavations at Fishbourne 1961–1969*, vol. **I**: *The Excavations*. Reports of the Research Committee of the Society of Antiquaries of London **27**.
— — 1971b. *Excavations at Fishbourne 1961–1969*, vol. **II**: *The Finds*. Reports of the Research Committee of the Society of Antiquaries of London **27**.
— — 1971c. *Fishbourne: a Roman Palace and its Garden*. London: Thames & Hudson.
Cunliffe, B. W., Down, A. G. & **Rudkin, D J.** 1996. *Chichester Excavations* **9**. Chichester: Chichester District Council.
Damiani, D. 2003. Pigments and plaster discovered in the house of Gliozzo E, Diana (Cosa. Grosseto. Italy): an integrated study, *Archaeometry Journal* **45**(2), 341–54.
D'Arms, J. 1970. *Romans on the Bay of Naples*. Cambridge (MA): Harvard University Press.
Davey, N. & **Ling, R.** 1982. *Wall-paintings in Roman Britain*. *Britannia Monograph* Series no. **3**.
Davis, S. 1992. *A Rapid Method for Recording Information about Mammal Bones from Archaeological Sites*. Ancient Monuments Laboratory Report Series **19/92**.
Dimbleby, G. W. 1988. *The Palynology of Archaeological Sites*. London: Academic Press.
Dobney, K. M., Jaques, S. D., & **Irving, B. G.** 1995. *Of Butchers and Breeds: Report on Vertebrate Remains from the City of Lincoln*. Lincoln: Lincoln Archaeological Studies **5**.
Dobney, K. 2001. A place at the table: the role of vertebrate zooarchaeology within a Roman research agenda for Britain, in *Britons and Romans: Advancing the Research Agenda*, eds S. James & M. Mille. CBA Research Report **125,** 36–45.
Down, A. 1978. *Chichester Excavations* **3**. Chichester: Phillimore.
— — 1989. *Chichester Excavations* **6.** Chichester: Phillimore.
Driesch von den, A.1976. *A Guide to the Measurement of Animal Bones from Archaeological Sites*. Peabody Museum Bulletin **1**. Cambridge (MA): Peabody Museum.
Dungworth, D. B. 2004. Caldarium? An antimony bronze used for medieval and post-medieval cast domestic vessels. *Historical Metallurgy* **38**, 24–34.
Edwards, J. 1984. *The Roman Cookery of Apicius*. London: Century Hutchison.
Empereur, J.-Y. & **Tuna, N.** 1989. Hieroteles, potier Rhodian de la Perée, *Bull. Corres. Héllenique* **113**, 277–99.
Fish, J. D. & **Fish, S.** 1989. *A Student's Guide to the Seashore*. London: Unwin Hyman.
Flower, B. & **Rosenbaum, E.** 1980. *The Roman Cookery Book*. London: Harrap, 22.
Forbes, R. J., 1955. *Studies in Ancient Technologies*. Leiden: E. J. Brill.
Fox, C. 1958. *Pattern and Purpose*. Cardiff: National Museum of Wales.
Frere, S. S. 1972. *Verulamium Excavations,* vol. **1**. London: Society of Antiquaries.
Frere, S. S. 1984. *Verulamium Excavations*, vol. **3**. Oxford: Oxford University School of Archaeology.
Fulford, M. 2001. Links with the past: pervasive 'ritual' behaviour in Roman Britain, *Britannia* **32**, 199–218.
Getty, R. 1975. *Sisson and Grossman's the Anatomy of the Domestic Animals*. Philadelphia (PA): W. B. Saunders & Co.
Goody, J. 1982. *Cooking, Cuisine and Class: a Study in Comparative Sociology*. Cambridge: Cambridge University Press.
Grant, A. 1971. The animal bones, in *Excavations at Fishbourne 1961–1969*, by B. Cunliffe. Report of the Research Committee of the Society of Antiquaries of London **28**. Leeds: Society of Antiquaries, 377–88.

— — 1981. The significance of deer remains at occupation sites of the Iron Age to the Anglo-Saxon period, in *The Environment of Man: The Iron Age to the Anglo-Saxon Period*, eds M. Jones & G. Dimbleby. Oxford: British Archaeological Reports British Series **87,** 53–64.
— — 1982. The use of tooth wear as a guide to the age of domestic ungulates, in *Ageing and Sexing Animals from Archaeological sites,* eds B. Wilson, C. Grigson & S. Payne. Oxford: British Archaeological Reports British Series **109**, 91–108.
— — 1987. Some observations on butchery in England from the Iron Age to the medieval period. *Anthropozoologica* Premier Numéro Spécial, 53–7.
— — 1989. Animals in Roman Britain, in *Research on Roman Britain 1960-1989, ed*. M. Todd. Britannia Monograph Series **11**, 135–46.
— — 2000. Biological and environmental analyses, in *Late Iron Age and Roman Silchester: Excavations on the Site of the Forum-basilica 1977, 1980–86*, eds M. Fulford & J. Timby. *Britannia* Monograph Series **15.** London: Society for the Promotion of Roman Studies, 425–82.
— — 2002. Food, status and social hierarchy, in *Consuming Passions and Patterns of Consumption*, eds P. Miracle & N. Milner. Cambridge: McDonald Institute for Archaeological Research, 17–23.
Grant, M. 2000. *Galen on Food and Diet*. London: Routledge.
Greig, J. 1991. The British Isles, in *Progress in Old World Palaeoethnobotany*, eds W. van Zeist, K. Wasylikowa & K.-E. Behre. Rotterdam: Balkema, 299–334.
Greig, J. R. A. 1971. Pollen analysis of the garden soil, in *Excavations at Fishbourne 1961–1969, vol. 2: The Finds,* by B. Cunliffe. Report of the Research Committee of the Society of Antiquaries of London **27**, vol. 2, 372–7.
Grigson, C. 1982. Sex and age determination in some bones and teeth of domestic cattle: a review of the literature, in *Ageing and Sexing Animal Bones from Archaeological Sites*, eds B. Wilson, C. Grigson & S. Payne. British Archaeological Reports British Series **109**. Oxford: BAR, 7–23.
Hamilakis, Y. 1998. *Eating the Dead: Mortuary Feasting and the Political Economy of Memory in the Aegean Bronze Age*. Sheffield: Sheffield Academic Press.
— — 2003. The sacred geography of hunting: wild animals, social power and gender in early farming societies, in *Zooarchaeology in Greece: Recent Advances*, eds E. Kotjabopoulou, Y. Hamilakis, P.Halstead, C. Gamble & V. Elafanti. London: British School at Athens, 239–47.
Hamilakis, Y. & **Konsolaki, E**. 2004. Pigs for the Gods: burnt animal sacrifices as embodiment rituals at a Mycenaean sanctuary, *Oxford Journal of Archaeology* **23**(2), 135–51.
Hamilton-Dyer, S. 1993. Animal bones, in *Excavations at County Hall, Colliton Park, Dorchester, Dorset, 1988*, by R. Smith. Wessex Archaeology Report **4**. Salisbury: Wessex Archaeology.
— — 1997. The animal bones, in Silchester: excavations at the North Gate, on the North Walls, and in the northern suburbs 1988 and 1991–3, by M. Fulford, S. Rippon, S. Ford, J. Timby & B. Williams, *Britannia* **28**, 130–35.
— — 2000. The fish remains, in *Late Iron Age and Roman Silchester: Excavations on the Site of the Forum-Basilica 1977, 1980–86*, by M. Fulford & J. Timby. *Britannia* Monograph Series **15**. London: Society for the Promotion of Roman Studies, 484–500.
— — n.d. (unpublished). Dorchester - Romano-British Deposits at the Greyhound Yard and Methodist Chapel Sites.
Hamshaw-Thomas, J. 2000. When in Britain do as the Britons: dietary identity in early Roman Britain, in *Animal Bones, Human Societies*, ed. P. Rowley-Conwy. Oxford: Oxbow, 166–9.
Harden, D. B. & **Price, J.** 1971. The glass, in *Excavations at Fishbourne* 1961–1969, vol. **2**, by B. Cunliffe, 317–68.
Hartley, K. F. 1974. The stamped mortaria, in Castle 1974, 261–2.
— — 1977. The mortaria, in Saunders & Havercroft 1977, 139–41.
— — Mortaria, in Holbrook & Bidwell 1991, 189–215.
— — 1998. The incidence of stamped mortaria in the Roman Empire with special reference to imports to Britain, in *Form and Fabric: Studies in Rome's Material Past in honour of B. R. Hartley*, ed. J. Bird. Oxford: Oxbow Monograph **80**.
— — 1999. The stamped mortaria, in Symonds & Wade 1999, 195–211.
Hawkes, C. F. C. & **Hull, M. R.** 1947. *Camulodunum: First Report on the Excavations at Colchester, 1930–1939*. London: Society of Antiquaries.
Henig, M. 1974. *A Corpus of Roman Engraved Gemstones from the British Isles*. British Archaeological Reports **8**. Oxford: BAR.
Hobbs, R. 1996. *British Iron Age Coins in the British Museum*. London: British Museum Press.
Holden, E. 1963. Excavations at the deserted medieval village of Hangleton, part 1. *Sussex Archaeological Collections* **101**, 54–181.
Holbrook, N. & **Bidwell, P. T.** 1991. Roman finds from Exeter. Exeter: Exeter Archaeological Reports **4**.
Hunter, P. n.d. The Faunal Remains at Batten Hanger and Watergate Hanger Villas. Unpublished report for Chichester District Council.
Ingrem, C. n.d. Animal Bone from the Late Romano-British Pits and Wells at Insula IX, Silchester. Unpublished report. Centre for Applied Archaeological Analyses, University of Southampton.
Ingrem, C. n.d. Assessment of the Animal Bone from the Roman Deposits at Westward House, Chichester, Sussex. Unpublished report for Chichester District Council. Centre for Applied Archaeological Analyses, University of Southampton.
Jenkins, I. 1985. A group of silvered horse trappings from Xanten (*Castra Vetera*), *Britannia* **16**, 141–64.
Jones, A. K. G. 1988. Fish bones from excavations in the cemetery of St Mary Bishophill Junior, in *Bones from the General Accident Site, Tanner Row*, by T. P. O'Connor. The Archaeology of York **15**(2). London: Council for British Archaeology, 126–31.
Keay, S. & **Carreras, C.** 1996. Amphorae, in *Excavations at Stonea, Cambridgeshire, 1980–85*, by R. P. J. Jackson & T. W. Potter. London: British Museum Press.
Kent, B. W. 1992. *Making Dead Oysters Talk*. Crownsville (MD): Maryland Historical & Cultural Publications.
Kent, S. 1989. *Farmers as Hunters*. Cambridge: Cambridge University Press.
King, A. 1978. A comparative survey of bone assemblages from Roman Britain, *Bulletin of the Institute of Archaeology* **15**, 207–32.
— — 1991. Food production and consumption — meat, in *Britain in the Roman Period: Recent Trends*, ed. R. Jones. Shef-

field: Department of Archaeology and Prehistory, University of Sheffield.
Laubenheimer, F. 1985. *La Production des Amphores en Gaule Narbonnaise*. Paris: Les Belles Lettres
Lauwerier, R. C. G. M. 1988. *Animals in Roman Times in the Dutch Eastern River Area*. Nederlandse Oudheden **12**. Amersfoort: Project Oostelijk Rivierengebied **1**.
Legge, A. J. 1992. *Excavations at Grimes Graves, Norfolk 1972–1976*, fasc. **4**, *Animals, Environment and the Bronze Age Economy*. London: British Museum Press.
Levitan, B. 1989. The vertebrate remains from Chichester Cattle Market, in *Chichester Excavations **6***, ed. A. Down. Chichester: Phillimore, 242–76.
Ling, R. 1991. *Roman Painting*. Cambridge: Cambridge University Press.
Liou, B. 1982. Informations archéologiques, direction des recherches sous-marines, *Gallia* **40**, 437–54.
London Museum. 1970. *Glass in London: an Exhibition held in the London Museum, Kensington Palace*, 1970.
Lyman, R. L. 1996. *Vertebrate Taphonomy*. Cambridge: Cambridge University Press.
Lyne, M. 2005a The pottery from the fills of the early ditch at Fishbourne, in Manley & Rudkin 2005d, 55–100.
— — 2005b Pottery (fine and coarse wares), in Manley & Rudkin 2005a, 105–7.
Mack, R. P. 1953. *The Coinage of Ancient Britain*. London: Spink and Son Ltd.
Maltby, J. M. 1985. The animal bones, in *The Prehistoric Settlement at Winnall Down, Winchester: Excavations of MARC3 Site R17 in 1976 and 1977*, ed. P. Fasham. Salisbury: Trust for Wessex Archaeology/Hampshire Field Club Monograph **2,** 97–112.
Maltby, M. 1994. The meat supply in Roman Dorchester and Winchester, in *Urban–Rural Connexions: Perspectives from Environmental Archaeology*, eds A. R. Hall & H. K. Kenward. Symposia of the Association for Environmental Archaeology **12**. Oxford: Oxbow, 85–102.
Manley, J. 2001a. Measurement and metaphor: the design and meaning of Building 3 at Fishbourne Roman Palace, *Sussex Archaeological Collections* **138**, 103–13.
— — 2001b. Excavations at Fishbourne Roman palace 1995–1999: interim statement, in *Archaeology of the Roman Empire*, ed. N. J. Higham. BAR International Series **940**. Oxford: BAR, 105–16.
— — 2002. *AD 43 and the Roman Invasion of Britain: a Reassessment*. Stroud: Tempus.
— — 2003. Inside/Outside: architecture and the individual at Fishbourne Roman Palace, in *The Archaeology of Sussex to AD 2000*, ed. D. Rudling. King's Lynn: Heritage Books, 127–40.
Manley, J. & **Rudkin, D.** 2003. Fishbourne before the conquest: royal capital of a client-kingdom?, *Current Archaeology* **187**, 290–98.
— — 2005a. Facing the Palace: excavations in front of Fishbourne Roman palace (Sussex, UK) 1995–99, *Sussex Archaeological Collections* **141**.
— — 2005b. A pre-AD 43 ditch at Fishbourne Roman Palace, Chichester, *Britannia* **36**, 55–99.
Manning, W. H. 1985. *Catalogue of the Romano-British Iron Tools, Fittings and Weapons in the British Museum*. London: British Museum Press.
Marsh, G. 1978. Early second century fine wares in the London area, in *Early Fine Wares in Roman Britain*, by P. Arthur & G. Marsh. BAR Brit Ser **57**. Oxford: BAR 119–224.
Martin-Kilcher, S. 1987. *Die Romischen Amphoren aus Augst und Kaiseraugst*. Bern.
— — 1990. Fischsaucen und Fischkonserven aus dem romischen Gallien, *Archeologie Schweiz* **13**, 37–44.
Mattingly H., Sydenham E. A., Sutherland C. H. V., Carson R. A. G., Webb P. H., Bruun, P. M, Pearce J. W. E & **Kent J. P. C.** 1923ff. *Roman Imperial Coinage* (10 vols). London: Spink and Son.
McWhirr A. (ed.) 1979. *Roman Brick and Tile*. BAR International Series **68**. Oxford: BAR.
Memmi Tubanti, I. & Spangenberg, J. E. 2003. Between, archaeology and scientific analyses. *Archaeometry* **45**(2), 341–54.
Monaghan, J. 1987. *Upchurch and Thameside Roman Pottery: a Ceramic Typology for Northern Kent, 1st to 3rd centuries AD*. BAR British Series **173**. Oxford: BAR.
Moore, P. D. & **Webb, J. A.** 1978. *An Illustrated Guide to Pollen Analysis*. London: Hodder and Stoughton.
Moore, P. D., Webb, J. A. & **Collinson, M. E.** 1991**.** *Pollen Analysis*. 2nd edition. Oxford: Blackwell Scientific.
Morales, A. & **Rosenlund, K.** 1979. *Fish Bone Measurements: an Attempt to Standardize the Measuring of Fish Bones from Archaeological Sites*. Copenhagen: Steenstrupia.
Morgan, M. H. 1960. (trans.) The Ten Books on Architecture (Vitruvius: *De Re Archtectura*). New York (NY): Dover Press.
Murphy, P., Albarella, U., Germany, M. & **Locker, A.** 2000. Production, imports and status: biological remains from a Late Roman farm at Great Holts Farm, Boreham, Essex, UK, *Environmental Archaeology: Journal of Human Palaeocology* **5**, 35–48.
Neal, D., Wardle, A. & **Hunn, J.** 1990. *Excavation of the Iron Age, Roman and medieval settlement at Gorhambury, St Albans*. HBMCE Archaeological Report **14.**
North, J. J. 1994. *English Hammered Coinage*, vol. **1**: *Early Anglo-Saxon to Henry III,* c. *600–1272*. 3rd edition. London: Spink and Son.
O'Connor, T. P. 1984. *Selected Groups of Bones from Skeldergate and Walmgate*. The Archaeology of York: the Animal Bones **15/1**. York: Council for British Archaeology.
Oldenstein, J. 1977. Zur ausrüstung römischer auxiliareinheiten, *Bericht der Römisch-Germanischen Kommission* **57**, 49–284.
Padley, T. G. 1991. Fascicule 2: The metalwork, glass and stone objects, in *Roman Waterlogged Remains at Castle Street*. by M. R. McCarthy. Kendal: Cumberland and Westmorland Antiquarian and Archaeological Society Research Series **5**.
Page, W. 1898. Notes on a Romano-British pottery lately found at Radlett, Herts., *Proc. Soc. Ants. London 2nd. Ser.* **17** (1898), 261–71. Also reported in M. V. Taylor, *VCH Herts* vol. **4**, (1971 reprint edition), 159–61.
Payne, S. 1973. Kill-off patterns in sheep and goats: the mandibles from Asvan Kale, *Anatolian Studies* **23**, 139–47.
— — 1985. Morphological distinctions between the mandibular teeth of young sheep, *Ovis*, and goats, *Capra*, *Journal of Archaeological Science* **12**, 139–47.
Payne, S. & **Bull, G.** 1988. Components of variation in measurements of pig bones and teeth, and the use of measurements to distinguish wild boar from domestic pig remains, *Archaeozoologia* **2**, 27–66.
Payne, S. & **Munson, P. J.** 1985. Ruby and how many squirrels? The destruction of bones by dogs, in *Palaeobio-*

logical Investigations: Research Design, Methods and Data Analysis, ed. N. R. J. Fieller. British Archaeological Reports (International Series) **266**. Oxford: BAR, 31–48.
Peacock, D. P. S. 1971 Roman amphorae in pre-Roman Britain, in *The Iron Age and its Hill-Forts*, eds M. Jesson & D. Hill. Southampton: University Archaeological Society, 161–88.
— — 1977a. Pompeian red ware, in *Pottery and Early Commerce*, ed. D. P. S. Peacock. London: London Academic Press, 147–62.
— — 1977b. Roman amphorae: typology, fabric and origin, *Collections de l'Ecole Française de Rome* **32**, 261–78.
— — 1978. The Rhine and the problem of Gaulish wine in Roman Britain, in *Roman Shipping and Trade: Britain and the Rhine provinces*, eds J. du Plat Taylor & H. Cleere. CBA Research Report **24**, 49–51.
Peacock, D. P. S. & **Williams, D. F.** 1986. *Amphorae and the Roman Economy*. London: Longman.
Polak, M. 2000. South Gaulish Terra Sigillata with potters' stamps from Vechten. Rei Cretariae Romanae Fautorum Acta Supplementum **9**. Nijmegen: Katholieke Universiteit Nijmegen, Afdeling Provinciaal-Romeinse Archeologie.
Powell, A. 1995–6. Appendix I. Bird bones and cremations, in The House of Amarantus at Pompeii (I,9,11–12): an interim report on survey and excavations in 1995–6, by M. Fulford & A. Wallace-Hadrill, *Rivista di Studi Pompeiant* **7**, 77–113.
Ponsich, M. 1974. *Implantation Rurale Antique sur le Bas-Guadalquivir*, vol. **1**. Madrid.
— — 1979. *Implantation Rurale Antique sur le Bas-Guadalquivir*, vol. **2**. Paris.
— — 1991 *Implantation Rurale Antique sur le Bas-Guadalquivir*, vol. **3**, Paris.
Price, J. 1996. A ribbed bowl from a late Iron Age burial at Hertford Heath, Hertfordshire. *Annales du 13e Congres de l'Association Internationale pour l'Histoire du Verre*, Amsterdam 1995, 47–54.
Price, J. & **Cottam, S.** 1996. The Roman glass from Fishbourne, 1983 and 1985–6, in *Excavations at Fishbourne 1969-1988*, by B. Cunliffe, A. Down & D. Rudkin. Chichester Excavations **9**. Chichester: Chichester District Council, 166–88.
— — 1998. *Romano-British Glass Vessels: a Handbook*. Practical Handbooks in Archaeology **14**. York: Council for British Archaeology.
Redjeb, T. B., 1992. Une agglomération secondaire des Viromanduens: Noyon (Oise), *Revue Archéologique de Picardie* **1/2**, 37–74.
Remesal, J. 1986. *La Annona militaris y la exportacion de aceite bitico a Germania*. Madrid: Universidad Complutense.
Rodriguez-Almeida, E. 1989. *Los Tituli Picti de las Anforas Olearias de la Betica*, Madrid: Universidad Complutense.
Rudd, C. 2004. *Chris Rudd List* **75** (sales list of Celtic coins). Aylsham: privately printed.
Rudling, D. 1987. The investigation of a Roman tilery at Dell Quay, West Sussex, *Sussex Archaeological Collections* **125**, 81–90.
— — 2001. Chanctonbury Ring revisited: the excavations of 1988–91, *Sussex Archaeological Collections* **139**, 75–121.
— — 2003. Fishbourne coins, *Sussex Past & Present* **99**, 6–7.
— — 2005. The coin finds from Fishbourne, 1961–1999, *Sussex Archaeological Collections* **141**, 99–103.
Russell, W. J. 1892. Egyptian colours, in *Medum,* by Sir F. Petrie & D. Nutt, London: D. Nutt.
Saunders, C. & **Havercroft, A. B.** 1977. A kiln of the Potter Oastrius and related excavations at Little Munden Farm, Brickett Wood, in *Hertfordshire Archaeology* **5**. St Albans: Verulamium Museum Occasional Paper **1**, 109–56.
Schmidt, E. 1972. *Atlas of Animal Bones*. Amsterdam: Elsevier.
Seaward, D. R. 1982. *Sea Area Atlas of the Marine Molluscs of Britain and Ireland*. Shrewsbury: Nature Conservancy Council.
Serjeantson, D. 1996. The animal bones, in *Refuse and Disposal at Area 16 East Runnymede***,** eds S. R. Needham & A. Spence. Runnymede Bridge Research Excavations, vol. **2**. London: British Museum Press, 194–223.
Sibun, L. 2005. Animal bone, *Sussex Archaeological Collections* **141**, 125–30.
Simpson, G. 1987 The decorated and plain samian pottery, in *The Roman Villa at Lullingstone, Kent*, by G. W. Meates. Kent Arch. Soc. Monograph Series **III**. Maidstone: Kent Archaeological Society, 153–63.
Somerville, E. M. 1995. Faversham Shell. Unpublished report for SEAS/FAU.
— — 2001. The marine and edible land molluscs, in Rudling 2001, 109–11.
— — forthcoming, Marine shell from the Late Iron Age ditch, in Manley & Rudkin 2005b, *Britannia* **36**.
Somerville, E. M. & **Bonell, J. K.** Marine shell, in Manley & Rudkin 2005a, 123–4.
Sparkes, I. 1976. *Old Horseshoes*. Shire Album **19**. Aylesbury: Shire.
Speakman, R. J. & **Neff, H**. 2005. Laser Ablation-ICP-MS, *Archaeological Research*. Albuquerque (NM): University of New Mexico Press.
Spurrell, F. C. J. 1895. Notes on Egyptian colours, *The Archaeology Journal* **52**, 223–39.
Stace, C. A., 1992. *New Flora of the British Isles*. Cambridge: Cambridge University Press.
Stead, I. M. & **Rigby, V.** 1989. Three imports from northern Gaul, in *Verulamium: the King Harry Lane Site,* by I. M. Stead & V. Rigby. London: English Heritage Archaeological Report **12**, 137–40.
Stockmarr, J. 1971. *Tablets with Spores Used in Absolute Pollen Analysis*. Pollen et Spores **13**. Paris: Museum national d'histoire naturelle, 614–21.
Sydenham, E. A. 1952. *The Coinage of the Roman Republic*. London: Spink & Son.
Sykes, N. J. 2004. The introduction of fallow deer (*Dama dama*): a zooarchaeological perspective, *Environmental Archaeology: The Journal of Human Palaeoecology* **9**, 75–83.
— — forthcoming a. Hunting for the Normans: zooarchaeological evidence for medieval identity' in *Just Skin and Bones? New Perspectives on Human-Animal Relations in the Historic Past*, ed. A. Pluskowski. British Archaeological Reports **S1410**. Oxford: BAR.
— — 2005, The animal remains in Manley & Rudkin 2005b, 55–99**.**
— — n.d. The Animal Remains from Longdole's Field Claydon Pike, Fairford, Gloucestershire. Unpublished report for Oxford Archaeology.
Sykes, N., Ingram, C. & **White, J**. forthcoming. Animal remains from the 2002 excavations at Fishbourne, Sussex.
Sykes, N. J., White, J., Hayes, T. & **Palmer, M.** forthcoming. Tracking animals using strontium isotopes in teeth: the role of fallow deer (*Dama dama*) in Roman Britain, *Antiquity*.

Symonds, R. P. & **Wade, S.** 1999. Roman pottery from excavations in Colchester, 1971–86, in *Colchester Archaeological Report* **10**, eds P. Bidwell & A. Croom. Colchester: Colchester Archaeological Trust.
Tchernia, A. 1986. *Le Vin de L'Italie Romaine*. Rome.
Teichert, M. 1978. *Die katzenknochen aus den Urgeschichtlichen kulthöhlen des kyffhäusergebirges*.
Tomalin, D. J. 1987. *Roman Wight: a Guide Catalogue to 'The Island of Vectis, very near to Britannia'*. Newport.
Tomber, R. & **Dore, J**. 1998. *The National Roman Fabric Collection*. London: Museum of London Archaeology Service.
Tomber, R. & **Williams, D. F.** 2000. Egyptian amphorae in Britain and the western provinces, *Britannia* **31**, 41–54.
Tomlin, R. S. O. 1992. The Roman carrot amphora and its Egyptian provenance, *Journal of Egyptian Archaeology* **78**, 307–12.
Toynbee, J. M. C. 1964. *Art in Britain under the Romans*. Oxford: Clarendon Press.
— — 1973. *Animals in Roman Life and Art*. London: Thames and Hudson.
Van Arsdell, R. D. 1989. *Celtic Coinage of Britain*. London: Spink and Son Ltd.
van der Werff, J. H. 1984. Roman Amphoras at Nijmegen: a preliminary report. *Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek* **34**, 347–87.
van der Veen, M. 2003. When is food a luxury? *World Archaeology* **34**(3), 405–27.
van der Veen, M. forthcoming. Luxury foods: their nature and role in Iron Age and early Roman southern Britain, in *We Are What We Eat: Archaeology, Food and Identity*, ed. K. Twiss. Occasional Publication **31**. Carbonale (FL): Centre for Archaeological Investigations.
Vitruvius, *De Re Architectura,* translated Morgan *q.v.*
Walke, N. 1965. D*as Römische Donaukastell Straubing-Sorviodurum*. Limesforschungen **3**. Berlin.
Walne, P. 1974. *The Culture of Bivalve Molluscs*. Farnham (Surrey): Fishing News (Books) Ltd.
Webster, G. A. 1971. A hoard of Roman military equipment from Fremington Hagg, in *Soldier and Civilian in Roman Yorkshire*, ed. R. M. Butler. Leicester: Leicester University Press, 107–25.
Wheeler, A. 1969. *The Fishes of the British Isles and North-West Europe*. London: Macmillan.
— — 1979. *The Tidal Thames: the History of a River and its Fishes*. London: Routledge and Kegan Paul.
Wheeler, A. & **Locker, A.** 1985. The estimation of size in sardines *(Sardina, pilchardus)* from Amphorae in a wreck at Randello, Sicily, *Journal of Archaeological Science* **12**, 97–100.
White, J. n.d. The Animal Bones from Fishbourne. Unpublished MA dissertation, University of Southampton.
Williams, D. F. & **Peacock, D. P. S.** 1983. The importation of olive-oil into Roman Britain, in *Produccion Y Comercio del Aceite en la Antiquedad*, eds J. M. Blazquez & J. Remesal. Madrid: II Congresso, 263–80.
— — 1994. Roman amphorae in Iron Age Wessex, in *The Iron Age in Wessex: Recent Work*, eds A. Fitzpatrick & Morris. Association Française D'Etude de L'Age du Fer, 29–32.
— — forthcoming. The eruption of Vesuvius and Campanian Dressel 2-4 amphorae.
Wilson, B. 1992. Considerations for the identification of ritual deposits of animal bones in Iron Age pits, *International Journal of Osteoarchaeology* **2**, 341–9.
Wilson, R. 1996. *Spatial Patterning among Animal Bones in Settlement Archaeology: an English Regional Exploration*. BAR British Series **251.** Oxford: BAR.
— — 1999. Displayed or concealed? Cross-cultural evidence for symbolic and ritual activity depositing Iron Age animal bones, *Oxford Journal of Archaeology* **18**(3), 297–305.
Winbolt, S. E. & **Goodchild, R. G.** 1937. A Roman villa at Lickfold, Wiggonholt, *Sussex Archaeological Collections* **78**, 13–36.
— — 1940. The Roman villa at Lickfold, Wigginholt, *Sussex Archaeological Collections* **81**, 54–67.
Winder, J. M. 1980. The marine mollusca, in *Excavations at Melbourne Street Southampton 1971–76*, by P. Holdsworth. CBA Research Report **33,** 121–7.
— — 1992. A Study of the Variation in Oyster Shells from Archaeological Sites and a Discussion of Oyster Exploitation. Unpublished PhD Thesis, University of Southampton.
Yannouli, E. & **Trantalidou, K.** 1999. The fallow deer (*Dama Dama* Linnaeus, 1758): archaeological presence and representation in Greece, in *The Holocene History of the European Vertebrate Fauna,* ed. N. Benecke. Berlin: Rahden.
Zienkiewicz, J. D. 1993. Caerleon: the Legionary Museum Site, *Britannia* **24,** 27–140.

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