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EXCAVATIONS AT THE ROMAN AUXILIARY FORT
AT LOUGHOR, WEST GLAMORGAN 1982-84 AND 1987-88

A.G. MARVELL AND H.S. OWEN-JOHN



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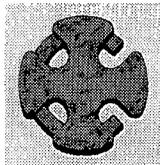
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LOUGHOR, WEST GLAMORGAN 1982-84 AND 1987-88

BY

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PREFACE AND INTRODUCTORY NOTES

The excavations reported here form one of the most comprehensive investigations of an auxiliary fort in Wales in recent years. This work was carried out by the Glamorgan-Gwent Archaeological Trust by means of two excavation projects separated by a three-year interval. The initial period of excavation occurred between April 1982 and May 1984, this was followed, after a short hiatus, by a programme of post-excavation work, which took place intermittently between February 1985 and August 1987. The second period of excavation was undertaken between September 1987 and August 1988 and this was followed immediately by the recommencement of post-excavation work.

Organisation of the excavation projects

During the first year, the excavation was financed principally by means of a Manpower Services Commission (MSC) Community Enterprise Programme (CEP). The MSC input was supported by additional grants from the Ancient Monuments Branch of the Welsh Office, West Glamorgan County Council, and Lliw Valley Borough Council. West Glamorgan County Council also provided rent-free premises for use as the project offices. In addition local societies, businesses, and individuals gave support, in some cases quite remarkable, both in terms of financial aid and also as services-in-kind. Amongst the many instances, the assistance of the Port Talbot Historical Society and Royal Insurance (UK) Ltd is particularly noted.

At first work was carried out on those areas owned by West Glamorgan County Council, as some of the other sites were in multiple ownership and certain landlords were difficult to trace. Eventually agreement was reached with the National Coal Board, the Duke of Beaufort's Estates, British Rail, and eight private owners.

By the end of the first year it was apparent that, in order to complete the work on time as well as extracting the maximum possible amount of information, a much larger MSC scheme would be needed. However, in the intervening period the regulations governing temporary employment schemes had been changed. The MSC Community Programme (CP) finally negotiated was supplemented by a grant of £18,000 from the Ancient Monuments Branch of the Welsh Office and generous donations from various private and public bodies.

In 1982 it was envisaged that the road scheme would be implemented in two stages and that the second stage would not occur until the middle of the 1990s. However, this schedule was subsequently changed and, as a consequence, the Trust had to carry out a further eleven-month period of investigation; this began in September 1987. The work-force was again recruited under the auspices of an MSC CP scheme, which was serviced by a grant from Cadw: Welsh Historic Monuments, which in the intervening three years had replaced the Ancient Monuments Branch of the Welsh Office. A further grant and services-in-kind were once again generously provided by West Glamorgan County Council, and the project was also supported both in terms of financial and practical assistance by many other private and public organisations and individuals.

During the various phases of road construction Trust staff continued to monitor the site through a series of 'watching briefs'.

Excavation problems, techniques, and recording systems

One of the major problems at the outset of the excavations was the removal of the overburden of nineteenth-century topsoil, which in places was up to 1.5 m deep. As the initial areas available for excavation were located in those parts of lower Loughor inaccessible to mechanical excavators, the topsoil had to be removed manually, although it was possible to redeposit this in directly adjacent areas. Only on Site 69 was the topsoil removed mechanically.

As the western part of lower Loughor was not developed in the medieval or early post-medieval periods, the more recent features either overlay or were cut into the topsoil; as a result of this the Roman features were particularly well-preserved, except in a few places where they had been removed totally by substantial features of recent date.

On the larger areas (Sites 53, 55, and 69; FIG. 1) it proved possible to excavate and record the site in accurately identifiable phases. On Site 53 many of the building phases were separated by substantial, uniform and widespread demolition deposits. As a consequence of these horizons and the resultant secure stratigraphic relationships, we have been able to produce a sequence of events that can be dated and divided with a reasonable degree of certainty. On Sites 55 and 69, set over the periphery of the fort, the phasing was less exact. Even so, the basic sequence of events was well established during the excavations and required only minor adjustments afterwards. The most difficult area was Site 57; here the chronology and function of the structures was less certain, principally because of the limited area available for excavation.

The numbers identifying each site are part of a continuous sequence used by the Trust. The archaeological remains were recorded on site using the context system. On all sites a consecutive sequence of numbers was given, even when excavated at different times (cf. Site 53). The finds were processed on site. Sorting for specialist study was undertaken after the excavations were concluded. Environmental samples were taken in response to specific discoveries during excavation, rather than as part of a pre-designed strategy. Plans were drawn at a scale of 1:20 using a base grid set up individually on each site, since it was not feasible to set up a universal grid for the whole development area. Sections and profiles were drawn at a scale of 1:20 or 1:10. On each site temporary bench-marks were established. Colour slides and some monochrome photographs were taken with Pentax SLR 35mm cameras, the remaining monochrome photographs were taken with Bronica and Hasselblad cameras with a 2½ inch square format. In 1983 part of the Trust premises in Swansea was destroyed by fire, with the consequence, as far as the Loughor excavations were concerned, that nearly all the finds from the first nine months of excavation, except those that had been sent to conservation, and all the black and white negatives and prints were destroyed.

The overall direction of the 1982–84 excavations was the joint responsibility of the authors, in addition A. G. Marvell directly supervised the excavation of Site 53 and H. S. Owen-John Sites 54 and 55. In the supervision of these excavations we were assisted by Mr B. Harries on all three sites and Mr P. Wells on Site 55. Elsewhere, the responsibilities for supervising the excavation of individual sites were divided. The authors together with Messrs Wells and E. G. Hughes supervised the excavation of Sites 57 and 66, whilst Sites 60 and 69 were supervised by Mr R. Hough; the excavation of part of the latter area was also supervised by Mr J. D. Zienkiewicz.

We were particularly fortunate not only in the professionalism shown by the site supervisors but also in that shown by the finds and illustration staff. Supervision of on-site finds work was initially undertaken by Mr R. Middleton-Jones, but following his departure Ms S. Corcoran undertook this responsibility, with assistance from Ms K. Francis. The compilation of the drawn record and on-site exhibition material was supervised by Mr C. A. P. Daly and Ms C. Cross. The photographs were taken by the authors, Messrs Hough, Hughes and Zienkiewicz and by Ms Francis and Mrs B. Griffiths. The 1987/88 excavation was directed jointly by Mr Owen-John and Mr B. Railton with supervisory assistance from Ms M. Bowen and Mr K. Dyer. Responsibility for the drawn record and the processing of finds rested respectively with Mr C. Seabright and Mr J. Purdue. Continual support and encouragement was received throughout the duration of both phases of excavation from the Director of the Trust Mr G. Dowdell.

Publicity

An initial public meeting in the church hall in 1982 attracted about 200 local residents, many of whom continued to show their support throughout the duration of the excavations. Public interest in the project was maintained by a series of articles and interviews in the local and national media. During working hours members of the public and school parties were given guided tours and groups from local societies also visited the excavations in the evenings or at weekends by prior arrangement.

Many local people were also prompted to work on the excavations in a voluntary capacity. During the first year information about the excavations was also disseminated to the public by means of a notice board and the Trust's travelling exhibition caravan, but these were replaced in 1983 by an on-site museum established in one of two vacant properties made available to the Trust by West Glamorgan County Council to cope with the increased office and facility space required as a result of the greater numbers of personnel employed.

The public was also given access to the excavations at Open Days. Several of these events were held, the most successful being on the 1983 May Day bank holiday when over 1,000 people visited the site. A brochure, compiled before the outset of the excavations, detailed the history of Roman and Medieval Loughor and the objectives of the forthcoming excavations; this was updated during the course of the excavations.

As the excavation progressed further information was given in interim reports published in the Glamorgan-Gwent Archaeological Trusts Annual Report (1981–82, 21–30; 1982–83, 31–63 (also published separately); 1983–84, 66–115; 1987–88, 20–3). Other shorter notes appeared in *Britannia* xiv (1983), 282–3; xv (1984), 268–9; xvi (1985), 255–6; xix (1988), 421; xx (1989), 260–3) and *Archaeology in Wales* (22 (1982), 24–5; 23 (1983), 37–9; 24 (1984), 53–5; 27 (1987), 46; 28 (1988), 59–62).

Post-excavation project arrangements

At first post-excavation work was carried out under the auspices of three small MSC CP schemes with the 'servicing costs' provided by Cadw. Following the demise of CP the full post-excavation costs were met on annually renewable project basis by Cadw. Overall supervision of the post-excavation projects rested with ourselves. However, responsibility for the production of both in-house and out-house reports rested with the Trust's Finds Officer Mr S. H. Sell. The following reports, in addition to those prepared by ourselves, were produced and we are indebted to the various specialists for their efforts: D. Allen (glass), D. Bailey (lamps), M. Dawson (iron objects), B. Dickinson (samian), D. R. Evans (amphora and lead objects), E. M. Evans (brick and tile), S. Greep (worked bone), K. Hartley (mortaria), M. Henig (intaglios), S. H. Sell (coins), G. Lloyd-Morgan (bronze objects), J. Parkhouse (stone objects), F. Probert (grain), I. R. Scott (dagger scabbard), P. Sadler (animal bone), P. V. Webster (coarse pottery), and J. L. Wilkinson (skeletal material).

The production of the illustrations was initially supervised by Mr C. A. P. Daly, subsequently by Mrs S. Railton but mainly by Mr P. Jones. They were assisted by Messrs P. Cadogan, A. Hartley and C. Seabright and Misses M. Pambianchi and S. Jones. The plates were prepared by Mr T. Davies.

Organisation of the final report

The information contained in this volume is the minimum required to achieve a reasonable understanding of both the history and development of Roman Loughor and the nature of the excavated remains. Therefore, full detailed descriptions of individual contexts and their inter-relationships are omitted and, wherever possible, described collectively rather than singly. At the same time sufficient information is given for the reader to comprehend the full range of data obtained through the excavation and contained in the site archive. Where groups of contexts have been allocated a group number these are listed in full at the ends of Chapters 2 and 3 so that cross-reference can be made with the dating sections and finds reports. Context numbers are used throughout the text without a site prefix except where this might cause confusion.

Except where stated context numbers referred to in the text are either depicted on plan and section or appear in the finds reports; group context numbers are enclosed in square parentheses both in the text and on the line drawings. References to secondary sources are in the Harvard format with abbreviations as far as possible in the manner recommended by the Council for British Archaeology. Some information and references to primary sources are given in footnotes. All dates are A.D. unless otherwise specified.

Fort north, which is the same as site north, has been used throughout the text; this is at 28° west of OS north. The majority of the structures are, therefore, described in terms of the principal cardinal compass points. Buildings were numbered separately on each site; here, for ease of reference, they have been renumbered to respect their sequence of presentation in Chapters 2 and 3. The rooms are lettered (omitting I, O, Q, U, and Z). In those instances where a room was either subdivided or modified during its period of use the following convention has been adopted: Room A becomes A¹ or A¹ and A² not A and A¹. Details on all drawings conform to the set of conventions given on the key below. Wherever possible, plans and sections have been reproduced at a scale of 1:100; some detailed plans are at 1:20.

The first chapter provides an introduction to the physical environment and the recent history of excavations in and around the environs of the auxiliary fort up to the start of our work.

The description of the excavated remains is contained in Chapters 2 and 3. The first of these sections is concerned with the sites located over or directly adjacent to the surviving defences (55, 57, 66, and 69) and the fort bath-house (54), Chapter 3 with the area opened up in the

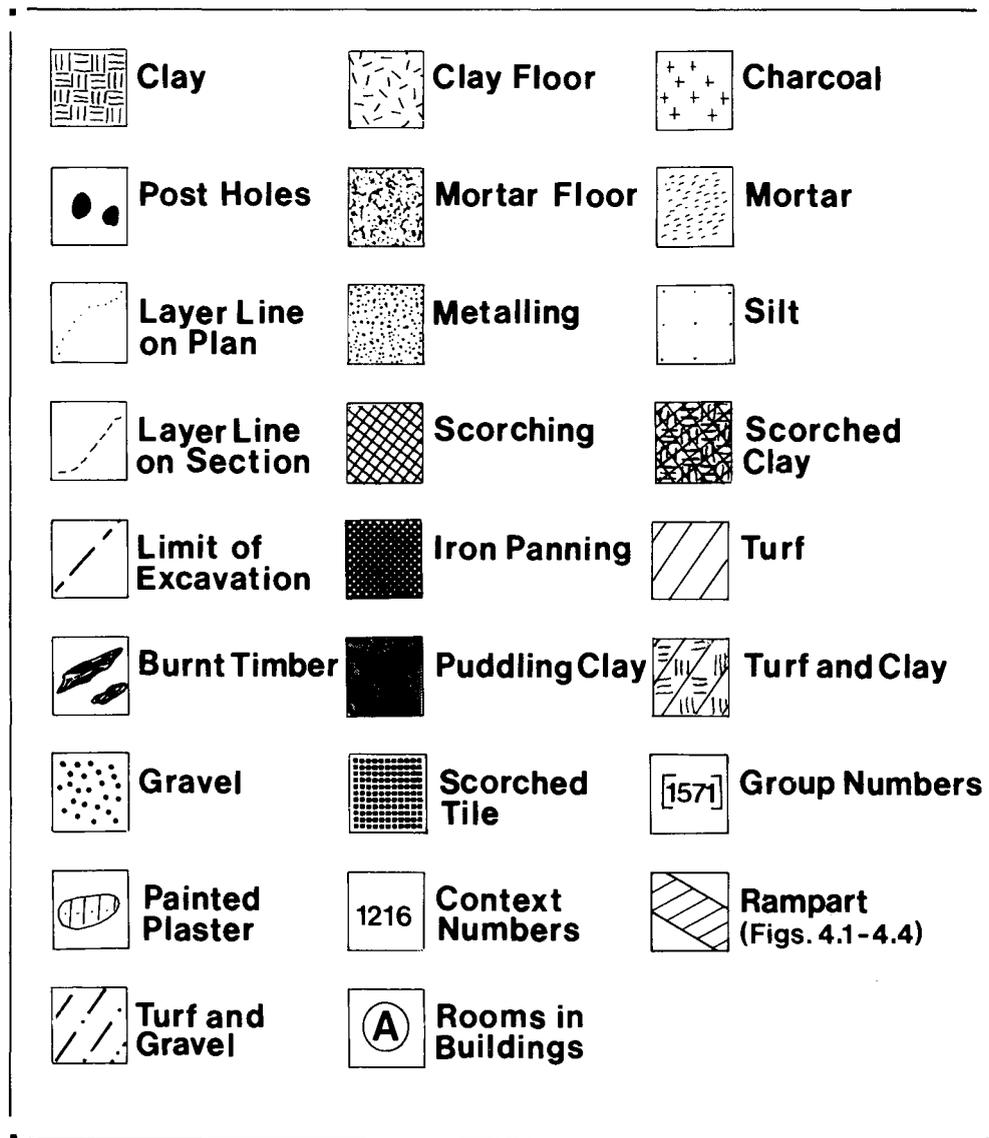


FIG. 0. Convention sheet (Figs 4.1-4.4=Figs 86-89).

interior of the fort. In Chapter 2 we have for the most part described the recorded evidence from the sites across the defences thematically rather than by sequential stratigraphic phase; the exception to this is sequences of building activity (particularly on Site 57), but here these are included within the wider thematic framework. The structural report for Site 53, here described in Chapter 3, is presented in order of stratigraphic phase starting with the earliest. In both chapters an introductory section is followed by a brief description of the exact location of each site and any relevant topographic details and information about the way the excavation was undertaken. Each of these chapters also contains sections outlining the dating evidence and discussions of the development and use of the site or particular structures at appropriate points.

In the final chapter we have attempted to compare and contrast the data retrieved from the various sites and, in addition, to review the results of our excavations within the relevant historical periods, in terms of both a local and wider perspective. The final reports on the categories of Roman material are placed at the end of this volume, with the exception of the grain, painted plaster, and brick and tile reports which have been located more appropriately in Chapter 3.

It should be noted that we have only described those features of post-Roman date which have disturbed the earlier deposits.

Acknowledgements

The excavation of an archaeological site as large and complicated as that at Loughor and the subsequent preparation of the final report could not have been successfully completed without the help and assistance of many individuals and public and private organisations. It seemed more appropriate that the specific roles of many of these persons or bodies should be described above; in addition to those individuals we would also like to thank the following: Mr and Mrs A. J. Butt; Mr C. Davies; The Misses Douglas; Mrs D. Dowdell; Mr and Mrs C. Evans; Mrs M. Gillis; Mr R. Gillis; Henry, Jones and Hobbs Ltd; Ms J. Hill-Kann; Mr and Mrs V. Howard; Mr A. J. Hunter; Mr R. Lewis; Professor R. Ling; Llŵchwr Society; Loughor Town Trust; Mr and Mrs V. Phillips; Mr and Mrs A. Rees; Hugh Rees and Co; The Somerset Trust; Mrs K. Thomas; Peter Williams (Solicitors); and last but by no means least Mrs G. Wood of No. 4 Dock Street, Loughor.

As might be expected the excavations attracted considerable interest amongst fellow archaeologists and students of the Roman army. In particular the excavations were visited by, amongst others, Professor G. D. B. Jones, Dr J. L. Davies, Mesdames K. Hunter and H. James and Messrs D. Benson, R. Brewer, G. C. Boon, D. Hogg, J. K. Knight, J. Lewis, C. Musson, M. Thompson, and A. Ward for whose advice, comment and encouragement we are grateful. We should also like to single out for a special note of thanks Mr P. V. and Mrs J. Webster who visited the site regularly and whose encouragement and freely-given advice especially on matters related to the ceramic evidence has been of great benefit. We are also grateful for the advice and discussion on various points received from Professors S. S. Frere, R. Ling, W. H. Manning, A. L. F. Rivet, Drs J. Davies and G. Webster, Mr M. J. Jones, and from our colleagues Dr E. M. Evans and Messrs G. Dowdell, D. R. Evans, N. Nayling, J. Parkhouse, S. H. Sell, and L. Toft. We owe a particular debt of thanks to Dr Evans for her comments on the architecture of the *praetoria*, the use of space within them, and for drawing the Italian parallels to our attention; her knowledge on such matters is insuperably greater than our own and this report would be that much the poorer but for her contributions. We should also like to thank the Editorial Committee of The Roman Society and in particular the Society's Publications Secretary for their kind assistance and helpful comments during the production of this report. Naturally, however, responsibility for the conclusions reached here and any errors therein contained remains with ourselves.

Finally we would like to express our thanks to the many people who were employed by the Trust on the excavation and post-excavation projects without whose efforts this report would not have been produced.

Archive

The excavation archive has been ordered in the format agreed between the four Welsh Archaeological Trusts, Cadw, and the National Monuments Record for Wales, and is lodged with the material remains at the National Museum for Wales.

CHAPTER ONE

THE BACKGROUND TO THE EXCAVATIONS

By A. G. MARVELL and H. S. OWEN-JOHN

THE PHYSICAL ENVIRONMENT

SITUATION AND TOPOGRAPHY

The present-day settlement of Lower Loughor (Casllwchwr) is located (at SS 5634 9798) towards the west end of a gravel spur on the east bank of the River Loughor (Afon Llŵchwr). This promontory together with its continuation Yspitty (Yspytty) on the opposite bank of the river are the remnants of a glacial moraine of sand and gravel formed during the final stages of the last Ice Age. At the point where the river has cut the moraine, the width of the river is less than 200 m. Immediately to the south of the moraine the River Loughor is joined by the lower reaches of the River Lliw (Afon Lliw) before both rivers enter a tidal inlet, the Burry Inlet, of the Bristol Channel.

At low tide the River Loughor presently occupies a narrow and shallow channel and is consequently fordable, but at high tide the estuary is navigable for vessels of limited draught.

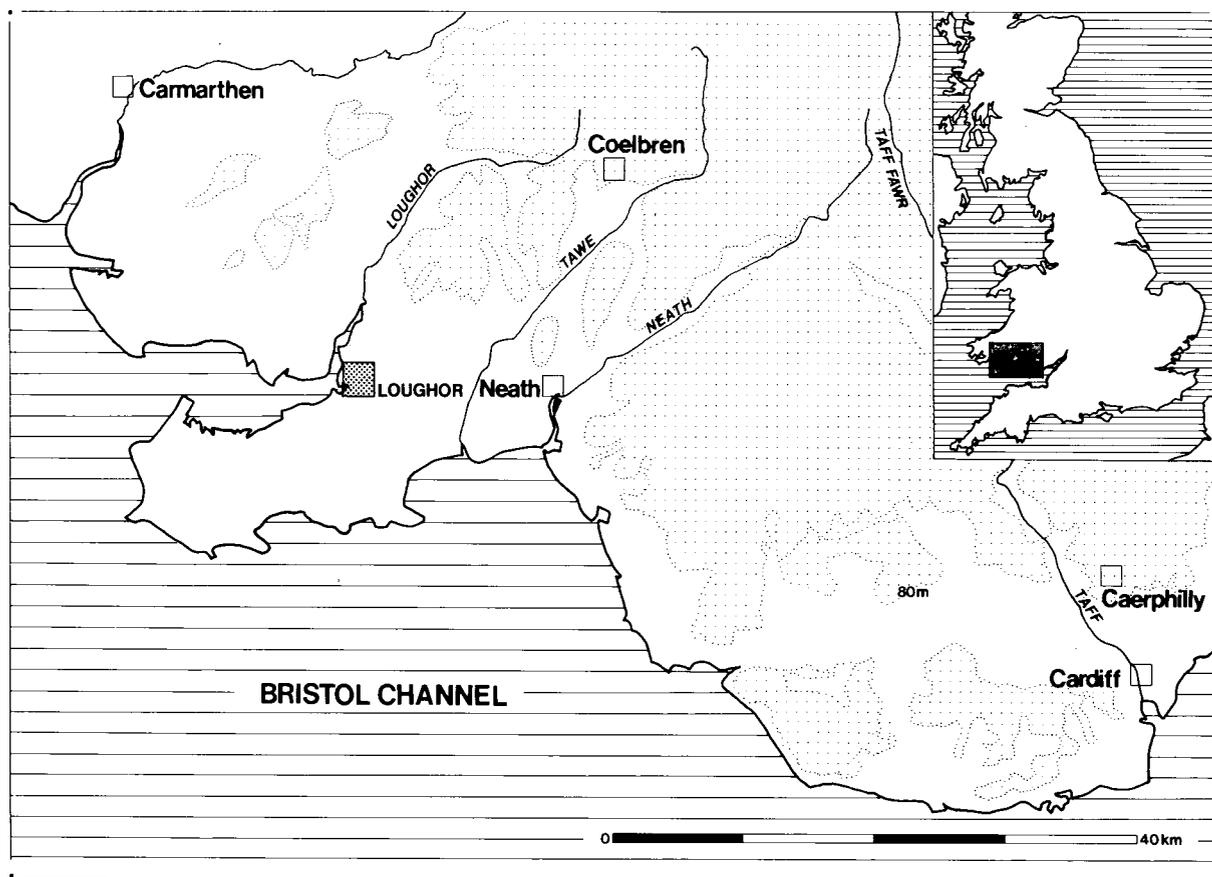


FIG. 1. The geographical location of the fort(s).

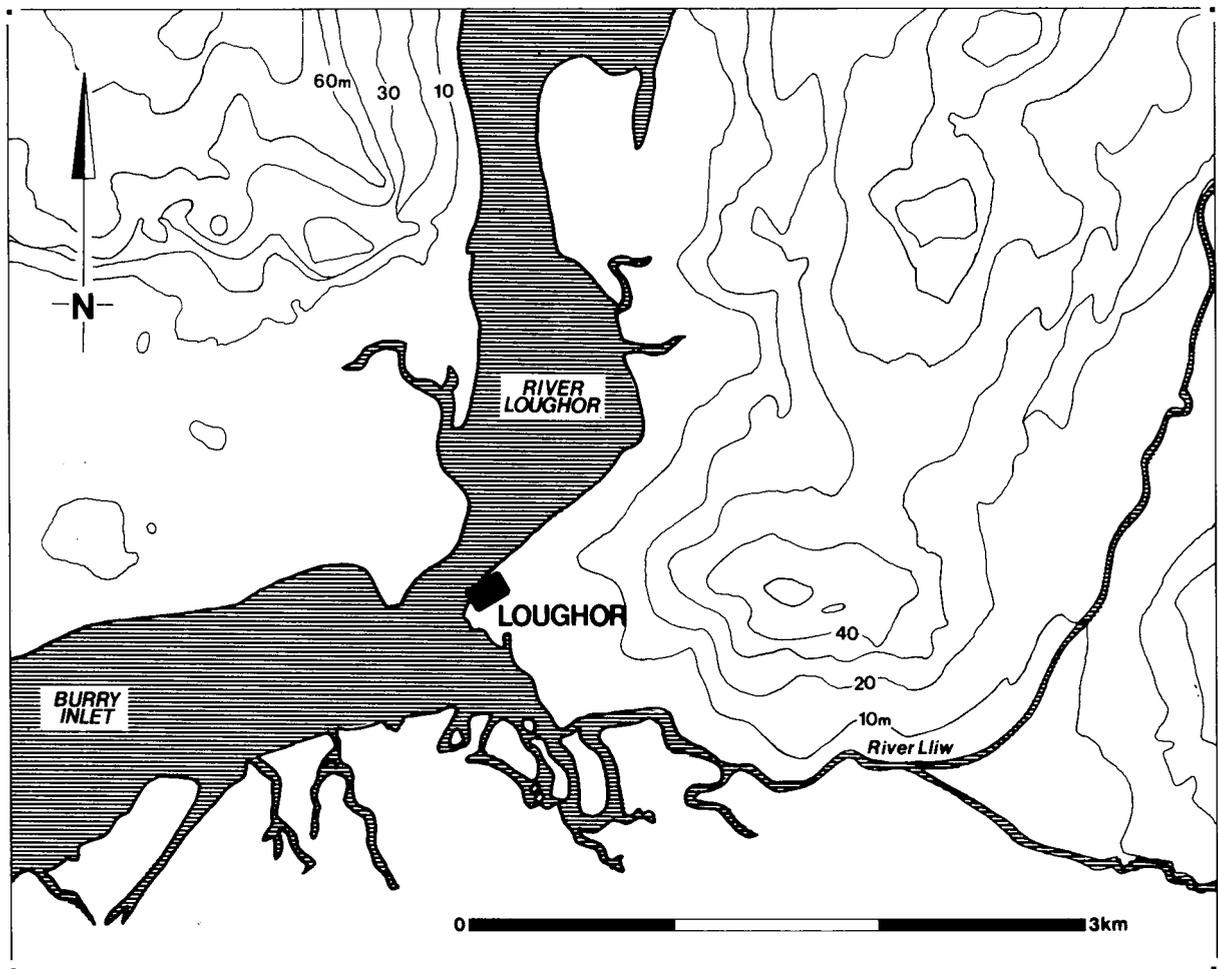


FIG. 2. The fort(s) in their physical setting.

Navigation charts of nineteenth-century date show that shipping of a reasonable size could utilise the estuary, a fact also attested by the still extant traces of docks constructed in the post-Medieval period near the end of the Loughor promontory. Many of the other rivers leading to the coast of South Wales experience a high tidal reach and the River Loughor is no exception. As the river widens out significantly to the north of Loughor, the next feasible crossing-point is some four miles upstream at Hendy. Changes in the tidal level (Toft, below) and industrialisation, at Burry Port in particular, have affected the course of the rivers and the shape of the estuary. The resulting marine and fluvial erosion has removed the south-west corner of the fort. It can be summarised (Toft, below) that the fort stood on a promontory overlooking a river plain and the confluence of the Rivers Loughor and Lliw.

The Loughor site has many natural strategic advantages. It is defended to the south, west, and north by the course of the rivers; only from the east is there a landward approach. Control is exerted over both the lowest feasible crossing of the River Loughor and one of the main routes into West Wales; at the same time the site possesses the additional advantages of sea-communication and a sheltered anchorage. From the crest of the spur relatively unrestricted views are enjoyed, particularly of Gower and the Carmarthenshire hills. The course of the River Loughor upstream of Hendy defines the western limits of the Black Mountains, but if the Rivers Marlais and Cennen are subsequently followed, the corridor formed by the River Tywi and the River Usk (which effectively delimits South-East Wales from the rest of the Principality) can be reached. Such strategic values as these would not have been overlooked by the Romans, and the value of the Loughor site in both military and commercial spheres was likewise recognised by the Normans and their successors.

Balanced against these advantages, however, is the fact that the Loughor promontory is not particularly well-suited to large-scale settlement. The ground on either side of the central ridge

of the spur drops quite steeply towards the Rivers Loughor and Lliw while the terminal of the moraine also slopes down towards the confluence of the rivers. Therefore, although there is a level area near the crest of the spur, the gradient elsewhere is considerable. As a consequence of this it was necessary to cut terraces into the natural slope in advance of the construction of the Roman structures and buildings. Although detailed discussion of the fort layout is reserved for a subsequent section, it can be stated here that the strategic value of the site evidently outweighed the technical disadvantages of the topography.

SUPERFICIAL GEOLOGY AND SOILS

Loughor lies on the fringes of the South Wales Coalfield, the southern flank of which, the so-called South Crop, is represented by Gower. The rock formations of Gower and the area immediately to the north of the peninsula were mainly laid down in the Carboniferous period, but outcrops of Old Red Sandstone Quartz Conglomerates occur above the 600 m contour (Owen 1971; George 1970).

The soils of Gower consist of two principal groups: *sols brun acides* and poorly drained gleyed soils. The latter form a band running from Llanrhidian to Swansea across the top of the peninsula and are of little agricultural use. It is not surprising therefore that the majority of the pre-Roman sites are concentrated in the south and west of Gower. Podzols are rare and occur only on the highest grounds.

THE PROBABLE TIDAL LEVEL IN ROMAN TIMES By L. A. Toft

Today the Roman station at Loughor is situated several miles downstream of the present tidal reach of the River Loughor. It is a matter of fact, however, that waterfront installations of Roman date are now several metres below today's tide levels (Waddelove & Waddelove 1990). In view of the magnitude of tidal rise since the Roman period, it is highly probable that the coastline has altered over the intervening centuries and there are grounds for presuming that today's estuarine locations for Roman sites were not so originally (Toft 1992).

Actual tide levels are a complicated phenomenon and vary from place to place, the Bristol Channel being particularly difficult. In addition to a continuing rise in mean sea level there is evidence for a long-term cyclic variation in tidal amplitude which reached a minimum during the centuries following the Roman withdrawal from Wales (Toft 1988; Toft 1992).

Probable tidal level c. 300

On the basis of a periodic cycle of 1,683 years in spring tide amplitude, with its maxima occurring in 1433 (Toft 1988), the tidal amplitudes in the Roman period, *c.* 300, would be similar to those experienced today, and thus simplify the computation of tide level change at Loughor.

From a sea level change of 3.34 m at Dover between 100 and today (Toft 1992), also the observed rise in sea level at Newlyn (Admiralty Tide Tables), the rate of mean sea level rise at Loughor can be taken as 2.26 m pa.

Thus an estimated tide level change between 300 and 1985 is 3.8 m.

Unfortunately, tidal data for Loughor does not appear in Tide Tables. The only guide to actual tide levels is the fact that an unclassified road connecting Gowerton and Loughor crossing the River Lliw is subject to flooding at high tides and the road level is 4.0 m AOD. A stretch of this road whose level is 5.0 m AOD is also known to flood at the highest tides. Assuming a normal spring tide of 4.5 m AOD the probable spring tide *c.* 300 would be + 0.7 m AOD or taking the 5.0 m figure + 1.2 m AOD.

At the seaward end of the Loughor/Burry estuary is Burry Port where tidal data are available for comparison with Dover. The present-day standard difference (MHWS) between Dover and Burry is 0.9 m (Admiralty Tide Tables). Taking the Roman High Tide at Dover as + 0.2 m AOD (Toft 1992), then the High Tide at the entrance to the Loughor estuary at that time would have been 0.2 m + 0.9 m or 1.1 m AOD.

In view of sea levels around 1.0 m AOD, i.e. 3.5 m to 4.0 m below today's tide level, it is almost certain that the site chosen by the Romans for their station was not as it appears today,

beside an estuary, but on a promontory overlooking a river plain and the confluence of two rivers (Lliw and Loughor).

THE RECENT HISTORY OF THE FORT

THE DISCOVERY OF THE BATH-HOUSE

The similarity of the place name Loughor with the *Leucarum* of the Antonine Itinerary led Camden (1695 edn, 64)¹ and subsequently the Reverend William Harris (1763, 9) to suggest that they were the same place, although the latter author knew of nothing 'antique' there except the remains of the castle (Harris 1763, 17). The earliest discovery of any corroborative evidence to support these identifications was the recovery of two Roman coins, one from the bed of the River Loughor, the other in a field known as 'Rhandir Eglwys' situated to the west of the church, in 1828 (Morgan 1899, 20).

The suspicion of a Roman settlement was confirmed in 1852 when part of a bath-house was exposed during the construction of the South Wales Branch of the Great Western Railway. Two histories of Gower written in the late nineteenth century recorded this discovery. Both of these works (Davies, J. D., 1877, 117; Morgan 1899, 19) mention that the railway line was built over the remains, thereby preserving them *in situ*. Morgan further stated that Colonel Francis had written a record of this discovery but that he had been unable to trace it. Haverfield (1909, 108) was also aware of this record 'but had not seen it'. Since part of the bath-house was exposed by our excavations (Lower Station House – Site 54), it was decided to attempt to locate Francis' description of this discovery.² That Francis had written, or at least had intended to write, about the bath-house is confirmed in a bibliography of his works compiled as an *aide-mémoire* in or before March 1873, which appears at the end of his volume of 'Charters granted to Swansea'. The fifth item reads, 'On the discovery of some remains of a Roman Bath at Loughor (Leucarum), when preparing foundations for the South Wales Railway there'.³ This work is not preserved in either of the two main depositories of Francis' papers in the Library of University College, Swansea or in the Royal Institution of South Wales and is now probably lost.⁴

Francis' correspondence for 1852 does however contain two significant letters.⁵ The earlier, dated to 26 July, was written by Alderman B. Jones of Goring Place, Llanelli and was previously cited by W. H. Jones (1920, 13–14). He wrote, 'Having heard of a Roman wall being found in the excavations for the So. W. R. below Loughor Castle, I went up to the spot some days ago to inspect it, when I discovered they had dug up a complete Roman Bath, six feet or more beneath the present surface of the ground, and on a level with, or rather below, the outer moat of the old garrison. The bath was lined with Roman tiles embedded in strong mortar. In the portion of the moat dug through they found several coins, and the piece of ware I left at the Royal Institution, with a portion of tile (appearing to have been one of the corner or angle tiles). The coins are taken away by the navigators. I have sent to them (now in Taff Vale), but I fear I shall not succeed in recovering any. I have about a barrow full of tiles from the Bath, which I would send in if you think it would be worth doing so in order to preserve the whole saved from the filling of the Railway Bank. One of the tiles has the print of a dog's foot in it, which was evidently made before the tile was baked. The piece of ware, I fancy, must be part of a soldier's "mess pot". The foundation of the wall could not be dug up and still remains'.⁶

The reference to 'the moat of the old garrison' is ambiguous. It might refer to physical evidence for the Roman fort surviving in the nineteenth century; the 1839 Tithe apportionment map and schedule records this area as 'Stout Wall Field', possibly because at least the fort rampart and ditch and perhaps the retaining wall were still visible.⁷ Equally, it may refer to the ditch of the Norman Castle, which, although not disturbed by the railway, would have been sufficiently close for comparative reference to be made.

The second item of correspondence, dated 2 August, was from one Samuel B. Allport of Sketty (Sgeti), Swansea (Abertawe) who wrote, 'I should think the enclosed is an authentic specimen of Roman pottery. I picked it up in our excavations at Loughor'. Presumably Mr Allport was in some way connected with the construction of the Great Western Railway. The

implication of Jones' letter is that some of the bath-house had been removed, in contrast to the statements of Morgan and Davies. W. H. Jones (1920, 14) also mentions a memorandum of Francis in which he refers to the 'remains of a hypocaust at Loughor, discovered in 1850, by the excavations made for work of the S. W. R. which that antiquarian succeeded in inducing the contractor to surround without destroying them, and there doubtless they remain'. As Jones points out this memorandum was probably written from memory and the hypocaust should be identified as the bath; if this is correct then it may also explain the apparent erroneous date given for the construction of the railway.⁸

The strongest piece of evidence against the assertions of Davies and Morgan is the description of the opening of the South Wales Railway in *The Cambrian and Weekly Advertiser* for 24 September 1852 (p. 2 col. 3); the relevant section of which reads, '... Mr B. Jones, one of the aldermen and one of the deputation presenting the address, also presented the chairman with a Roman bath tile which had been dug by the forming of the Railway near Loughor Bridge, a few weeks ago. The tile formed part of a Roman bath which was discovered in the excavation just below the outer moat of Loughor Castle,⁹ the Leucarum of the Romans. There are several of the Roman tiles preserved which formed the bottom of the old bath. The navvies on the Railway did not possess sufficient taste for antiquities to stop the ruthless digging up of the bath, before anyone save themselves had an opportunity of inspecting it. The tile selected as a memento of this interesting event had on it a most perfect footprint of a Roman mastiff, or Pannonian dog, which had been made whilst the tile was in process and afterwards burnt without being in the least bit defaced. The chairman and directors seemed interested and gratified with so novel a "bit of antiquity", added to the hearty welcome given to the G. W. R. at Loughor'.¹⁰

Although it is likely that not all the contemporary material has survived (for instance the archives of the Great Western Railway are not particularly full on this matter), sufficient does exist to suggest that the assertions of Davies and Morgan that the bath-house had been preserved is incorrect, and that any record made of the structure and recovered finds was largely due to the efforts of Alderman Jones. The excavations (Sites 54 and 66) undertaken by ourselves in this part of the fort would appear to confirm this, as part of the bath-house was preserved in the first area, which was unaffected by the railway works, whilst on the opposite side of the line (an area formerly used as sidings) all traces of any Roman activity had been removed completely.¹¹

THE DISCOVERY OF THE FORT

Although Alderman Jones can now be credited with the first identification of the exact situation of at least part of the fort, confirmation of his assertions by archaeological methods resulting in a precise location of the fort was not to happen for more than a century.

Following the location of the bath-house, further finds of Roman origin were periodically discovered. These included a sestertius of Domitian recovered from St Michael's churchyard,¹² an amphora with bluntly carved handles,¹³ and items of glass, pottery, and brick.¹⁴ Of particular note is the record of a hoard, now lost, of sixty coins minted during and between the reigns of Gallienus and Constans exhibited by a Mr Eaton to the British Archaeological Association in 1856.¹⁵ Other evidence of late Roman activity in the vicinity of the fort includes an altar of second- or third-century origin but reused, perhaps as a tombstone, and marked with a damaged Ogham inscription of the fifth or early sixth centuries (Morgan 1899, 19; Glam. Invent. Vol. 1, 3, 845).

In 1968 a row of small houses directly adjacent to the Norman castle was demolished and subsequent landscaping involved an accompanying programme of excavation conducted by Mr J. Lewis of the National Museum of Wales undertaken in the following year. Lewis and his team located, in three sections, parts of the fort's eastern and southern defences, including the remains of a stone corner-tower (Lewis 1975, 148-9) above which a coin of Constantine II as Caesar (A.D. 234-330) was recovered (Ling & Ling 1973, 119).

Following these discoveries more intensive investigations into the remains of the fort were carried out by Drs R. and L. Ling in the summers of 1970, 1971, and 1973. The first two

seasons' work concentrated on the defences at the east end of the fort, although two small trenches (F & H = C1 & C2) were cut at the west end of the village in the upper gardens of Station House. In the first season three sections were opened out mechanically, the first (A1) was sited between those dug by Lewis, the others (A2 & A3) on open ground to the east of Ferry Road. The north-east angle of the fort defences was located in A3. In the following year two further test sections (A4 & A5) and two larger areas (B1 & B2) were opened out in order to examine more closely the occupation sequence in this part of the fort. In 1973 three further test trenches (J1, J2, and K) were cut in the Upper Station House Gardens and also to the rear of No. 6 Dock Street in order to assess more fully the archaeological potential of the remains in the western half of the fort, an area which had been cursorily examined in the preceding season. The work in the west half of the fort was of particular importance as the road and bridge scheme was already being mooted.

We do not propose to describe in detail the results of these investigations (Ling & Ling 1973; 1979). Instead the principal discoveries are briefly summarised so that our own work can be placed in proper perspective.

Excavation across the defences suggested three phases of activity. Occupation started *c.* 75 and was represented by the construction of a rampart formed from a core of gravelly clay faced with cheeks of turf and grey-white clay fronted by a single V-shaped ditch. At the south-eastern corner of the fort the rampart was founded upon a raft of river cobbles to prevent slippage, but in the north-eastern corner, where the slope immediately outside the defences was steeper, the defensive bank was set on a terrace cut into the natural subsoil. Although parts of the north-eastern corner of the defences had been truncated by later activity, sufficient had survived to suggest that the ditch had been cut to a depth of *c.* 2 m and that the basal width of the rampart measured between 8.5 m and *c.* 11 m. This variation may have occurred as a result of the sharp drop in ground level towards the corner of the fort with the resultant need to achieve extra height in the terraced rampart (Ling & Ling 1973, 107).

The second phase of activity, which started *c.* 110, was represented by rebuilding in stone. A one-metre-wide wall, constructed from mortared sandstone blocks set on a foundation of cobbles, was inserted into the face of the existing rampart. As a consequence, the ditch, which was aligned in such a way as to suggest that there would have been insufficient space between its inner edge and the revetment wall, was recut. The replacement ditch was of similar dimensions to the earlier feature, although in places it had been cut unusually close to the revetment wall. No trace of an angle-tower was found, but this may have been removed by the destruction of the upper part of the rampart. A lime-kiln constructed outside the defences was believed to be contemporary. Three cremations were cut into the rear of the rampart; the pottery associated with them implied that the fort had been abandoned *c.* 120–130.

Immediately to the rear of the rampart a succession of five timber buildings was observed (in B2). However, insufficient of the plan of any of these structures was recovered for their function to be identified, although it is possible that they were stores. The excavators were also unable to relate these structures to the features located immediately to the rear of the rampart (in B1) or to the modifications of the defences, mainly as a result of later disturbances, but it was apparent that a complicated sequence of activity was to be found in the interior of the fort.

The final period of activity occurred in the late third century. This was represented by the location of a third ditch outside the line of the earlier defensive features. On the east side of the fort a double line of defences may have been employed, as two features *c.* 4 m apart were located (in A2). These ditches were different in size but were shallower than the earlier examples. The north-east angle of the defences was further protected by a *chevaux de frise*. Evidence for contemporary activity in the interior of the fort had been destroyed.

Further evidence of a complicated occupation sequence, including parts of a possible granary and a building with mortared floors in the interior of the fort, was found in the trenches cut in its western part. Six phases were identified. Although this sequence has been amended and enlarged as a result of our own work here (Site 53), two points should be stressed, firstly that the test sections were sufficiently well-recorded for the evidence located there to be linked with

that found by us and secondly that the excavators deliberately limited their investigations of the earliest phases so that some of the later and better preserved deposits might be retained.

An outline of the main correlations between the Lings' sequence of activity and that recorded by us is given below, further details are retained in the site archive. The majority of their Phase I and II deposits belong to our Phases 2 and 3, the remainder of the features in their Phases I–III may be ascribed to Phases 4–7 excavated by ourselves. Our Phases 8 and 9 can be paralleled in the earlier excavations by the following features and layers:- Phase IV (Layer 28), Phase V (mortar floors and Partition S), and Phase VI (Gully 70);¹⁶ the other elements of Phase IV can be shown to belong to our Phases 11 and 12. The remaining features identified in 1973 (Walls Q/V, T and W and Trench U) form part of a stone building described in our Phases 14 and 15. It was apparent to the Lings (1979, 24) that the structures at the west end of the fort were of considerable importance and that it would be necessary for an open-area excavation to be undertaken for the relationship between these structures and their layout to be better understood.

THE DEVELOPMENT THREAT

Late in 1981, the Trust was advised by the West Glamorgan County Clerk that the County Council would shortly be submitting for planning approval development proposals involving the replacement of the existing road bridge across the River Loughor with a new structure some 50 m downstream. This bridge would end on the Loughor side of the river at a large roundabout from which a link road would run to the existing main Swansea–Llanelli route through Loughor. It was also proposed that at a later stage a new main road from Swansea to Llanelli would be constructed on a line to the south of the existing route. The effect of these proposals was that about one-fifth of the surviving parts of the auxiliary fort would be destroyed; about one-fifth of the fort had been destroyed in the nineteenth century during the construction of the Great Western Railway and a branch line to the colliery at Broadoak. Following close examination of the proposals and discussions with the developers, it was clear that because of the local topography there was no possibility of either diverting the scheme so that the river was crossed elsewhere or preserving the buried remains beneath the proposed road system. Ironically, the same reasons that had made the site so attractive to the Romans also dictated the form of the development threat. As previous excavations (above) had clearly demonstrated that the buried deposits were particularly well-preserved, the decision was taken early in 1982 to mount a programme of continuous excavation in order that all the threatened areas (FIG. 3) could be fully examined.

A NOTE ON THE PLACE NAME *LEUCARUM*

The place name *Leucarum* is probably derived from the Celtic *leuco* meaning 'bright' or 'shining' and the water suffix *ar(a)*, and therefore is simply the river name transferred with a change of declension to a site on the banks.¹⁷ Although apparently repeated with the English Loughor or Welsh Afon Llwhwr and Cas-Llwhwr, these names cannot be connected with the Latin *Leucarum* on phonological grounds. However, the similarity must be due to more than mere coincidence and perhaps the differences have occurred through a disturbance to the normal phonetic processes (Rivet and Smith 1981, 388–9).

The name *Leucarum* occurs only in one known source – *Iter XII* of the Antonine Itinerary. *Iter XII* is one of the more difficult routes in the British Section of the Itinerary as the text is distorted and corrupt. There have been several attempts to make sense of the route (most recently – Ling & Ling 1973, 124–5; Rivet & Smith 1981, 173–6; Webster 1984, 286–8). Ingenious as these efforts are, the unknown factors and necessary hypotheses are too many for the conclusions to be fully accepted without the support of further archaeological evidence.

Although the placing of *Leucarum* at Loughor disagrees with the mileages given in the Itinerary, the other possible candidate, Hendy, which is approached by a road from Carmarthen and is the next feasible upstream crossing of the river, can be discounted for the present. It is likely that a road (see below Chapter 4) ran north from the fort on the east side of the river and this

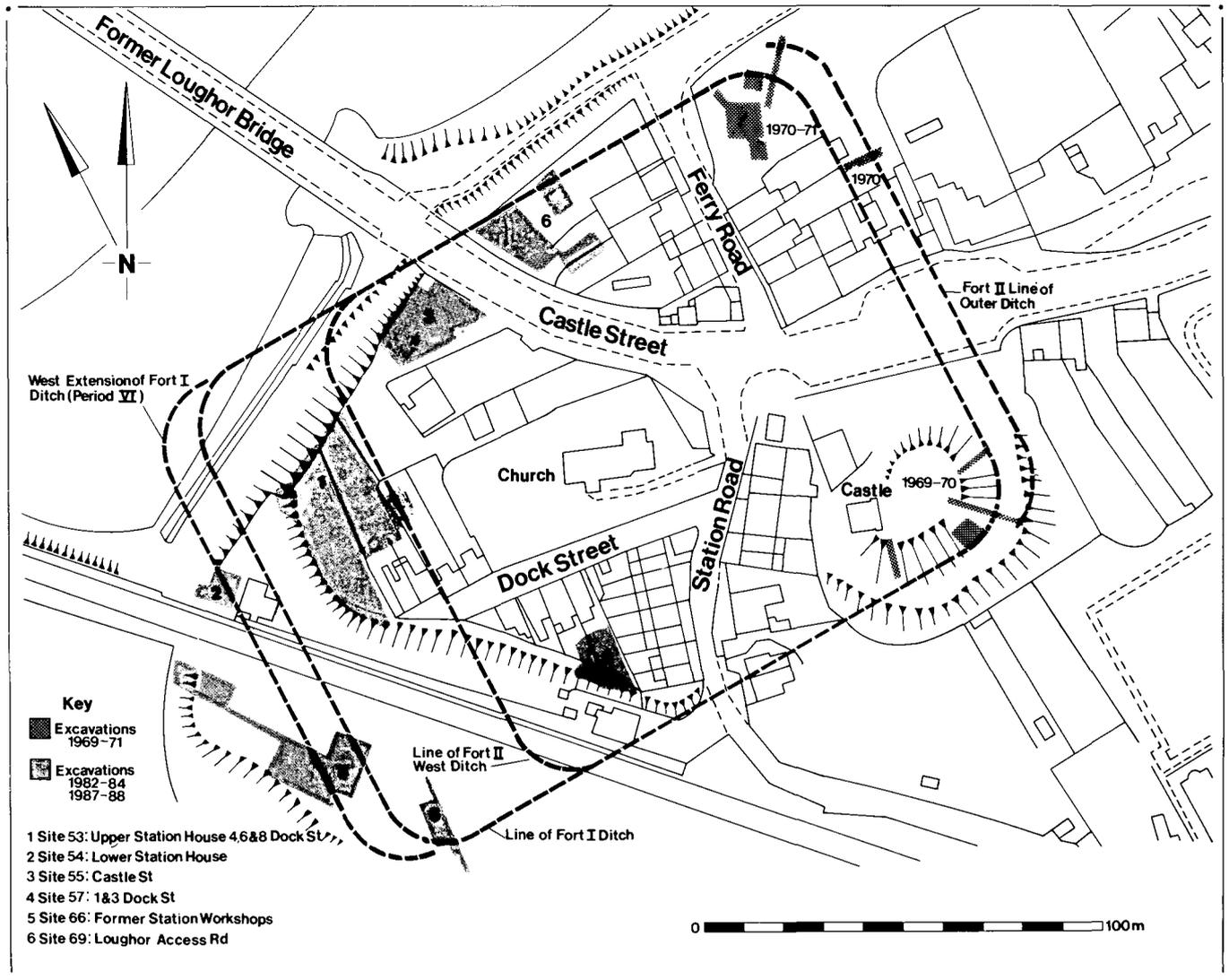


FIG. 3. The excavation sites 1982-84 and 1987-8.

almost certainly would have linked up with a crossing at Hendy and thus lends weight to Rivet and Smith's (1981, 174) proposed emendation to this part of the Itinerary.

NOTES to Chapter 1

1. 'But a more ancient place than this is at the river Loughor, which Antoninus calls Leucarum and is at this day (retaining its ancient name) called Loughor (in British Kas-Llwchwr).'
2. In this we were assisted by one of the Glamorgan-Gwent Archaeological Trust's former Sites and Monuments Record assistants, Mr A. J. Hunter, to whose efforts we are greatly indebted. It is clear from the Haverfield archive in the Ashmolean Library that the latter went to some considerable effort to locate Francis' work with no success. Correspondence between him and Morgan indicates that Morgan had also made a thorough search.
3. A copy of this list can be found in a collection of material gathered by Colonel Morgan for his history of Gower in a folder labelled G. C. Francis Esq. 'Misc. Notes on Antiquarian Research' held in the Royal Institution of South Wales.
4. Despite exhaustive enquiries, it has not been possible to locate this work elsewhere. Indeed many of Colonel Francis' publications were limited editions printed for private circulation, and it is possible that this is the case here. All his papers were originally deposited in the Royal Institution, of which Francis was a founder member and president.

5. Now held in University College, Swansea.
6. The Royal Institution's Register of Museum Specimens for 1852 records the following entry: 'A 852.1 Flat brick slab with raised corner, Roman – from Loughor, Glamorgan. Donated by Mr B. Jones'. Also in the Catalogue and Guides 1894–1931 on p. 21 of the Catalogue of Antiquities under List of Roman Finds from Loughor: '77 Flat brick slab with raised corner pieces, marked with dogs feet before being burnt. Found at Loughor'.
7. The ditch at the south-western corner of the fort was revealed in our own excavations (Loughor Station Workshops – Site 66).
8. We have been unable to trace this memorandum. It seems possible that Francis in fact never visited the site.
9. In fact the west defences of the fort.
10. A similar account of the opening ceremony was given in the September edition of the *Swansea Herald and Guardian*. It, too, states that the bath-house was destroyed. It is perhaps significant that no mention is given of any involvement of Colonel Francis, who was then currently one, if not the most prominent, of the local antiquarians.
11. Davies (1877, 177) describes the remains as 'of the *sudatorium* of a bath'. As Jarrett (1969, 167) and others have pointed out, it was a popular misconception to use the term *sudatorium* for the area attached to the main furnace of the hottest room, an area normally occupied by the main hot bath (*alveus*). The location of a substantial furnace, close to the railway line, on Site 54 would seem to imply that this also is the case here.
12. *JRS* xvii (1927), 186.
13. *Archaeol. Cambrensis* xciv (1939), 29.
14. Royal Institution of South Wales Accession Nos Ax 38–40.
15. *J Brit Archaeol Ass* xii (1856), 157–8, 239. Only one of these coins is certainly of fourth-century date. The hoard also included a, probably misidentified, Syracusean Greek Chalcos ascribed to Gelo 1.
16. The similarity of the mortar floors and Layer 28 led the Lings to suggest that they might be contemporary.
17. It can be noted that the water in the estuary appears to be bright or shining, particularly in low sunlight, when viewed from the fort.

CHAPTER TWO

EXCAVATION OF THE DEFENCES AND *INTERVALLUM*

By A. G. MARVELL and H. S. OWEN-JOHN

INTRODUCTION

The component parts of the defences of the fort were examined at a number of points. The north rampart was encountered on Sites 55 and 69 and a small section of the south rampart on Site 57; the ditches were investigated on Sites 66 and 69 and during salvage work to the south of Dock Street in 1989. With the inclusion of evidence recorded at the castle by Lewis (1975) and at Ferry Road by Ling and Ling (1973) a detailed picture of the rampart and its construction can be assembled, although the ditch system remains less well understood. Part of the west tower of the north gate was located on Site 55. Evidence for the modification of these defences, in the form of the insertion of a stone revetment to the front of the rampart and the cutting of a new ditch, was principally recorded on Site 69 with supplementary evidence recorded on Sites 55 and 66.

In addition to the primary fort defences, a north-south rampart, which reduced the area of the fort by approximately one third, was recorded on Sites 55 and 57 and during salvage work immediately to the south of Dock Street in 1989. A ditch which was almost certainly associated with this rampart was recorded on Site 53 and noted during the 1989 salvage operation.

The rampart of the reduced fort was subsequently modified, principally by the addition of a stone wall to the crest of the bank. This feature was recorded on Site 55, with supplementary evidence recorded on Site 69. A massive post-built tower, located immediately within the angle of the reduced fort defences on Site 57, was probably contemporary with this activity.

The *intervallum* was investigated in all the excavation areas with the exceptions of Site 54 (Lower Station House), which was located outside the west defences of the fort, and Site 66, where the construction of the Great Western Railway and associated workshops had totally removed the archaeological deposits relating to the *intervallum*. The *via sagularis* (*intervallum* road) was examined on Sites 53, 55, 57, and 69. On Site 55 the *intervallum* was crossed by the *via principalis*.

Most of the excavation areas at Loughor lay on or close to the line of the defences. Only on Site 53 was a substantial part of the interior of the fort excavated (Chapter 3). However, parts of Sites 55, 57, and 69 all extended slightly within the line of the *via sagularis*; for ease of presentation the limited data recorded in these areas are described in the *intervallum* section below (p. 62).

A functional rather than phase-by-phase method of description has been adopted to describe the sites located on or close to the line of the defences. The identified functions are as follows:

- The Rampart and Fort Wall
- The Ditches
- The West Tower of the North Gate
- The *Intervallum*
- The Reduction of the Fort and Subsequent Modifications
- Extra-mural Structures

Reference to the individual site phase summaries appended to this chapter will facilitate access to the detailed data retained in the archive.

SITES 54, 55, 57, 66, AND 69: LOCATION, TOPOGRAPHY, MODERN INTRUSIONS, AND EXCAVATION METHODOLOGY

SITE 55: LAND TO THE WEST OF CASTLE STREET (FIGS 3, 4)

The largest individual site crossing the defences was that to the west of Castle Street (Site 55). At the time of excavation the site was defined to the east by Castle Street (A484), to the north by the cutting for the former Broadoak Colliery mineral railway line, and to the south and west by the boundary with 77 Castle Street (Riverside Mansion). The parcel of land occupied an area of *c.* 350 m², and now carries one of the eastern approach roads (A484) to the new Loughor bridgehead.

A row of houses built in the nineteenth century and demolished in the 1950s had occupied the Castle Street frontage and their rear gardens formed the remainder of the parcel. As the land at this point slopes down to the north and east towards the river, the houses had been terraced into the slope in a series of steps. Their footings had disturbed the upper part of the Roman stratigraphy in some places, but cultivation of the rear gardens had resulted in only slight attrition. The lower superstructure of the houses and rubble from their demolition was present on the street frontage. The northernmost end of the terrace contained a cellar approached by a curving passageway, both of which had cut deeply into the Roman deposits. The whole area was overgrown, with mature deciduous trees present. In the south-west corner of the site the topsoil

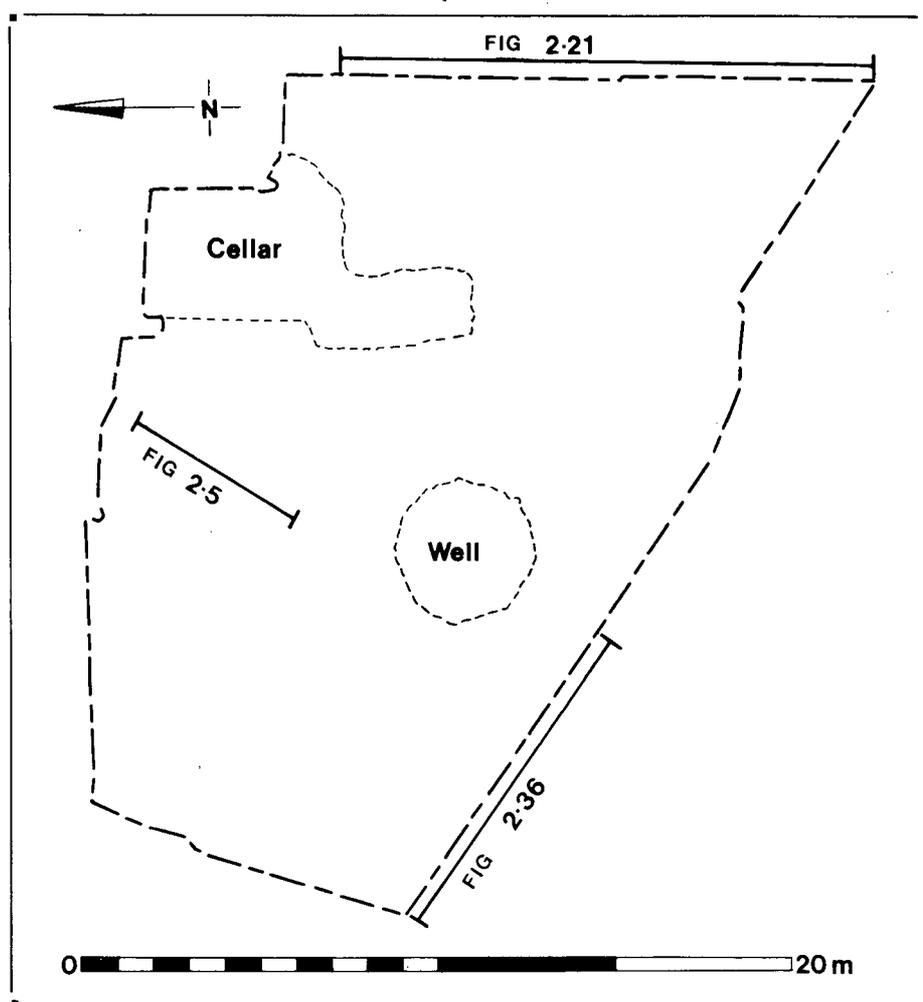


FIG. 4. Site 55: Location of modern features and sections (Fig. 2.5=Fig. 8, Fig. 2.21=Fig. 24, Fig. 2.36=Fig. 39).

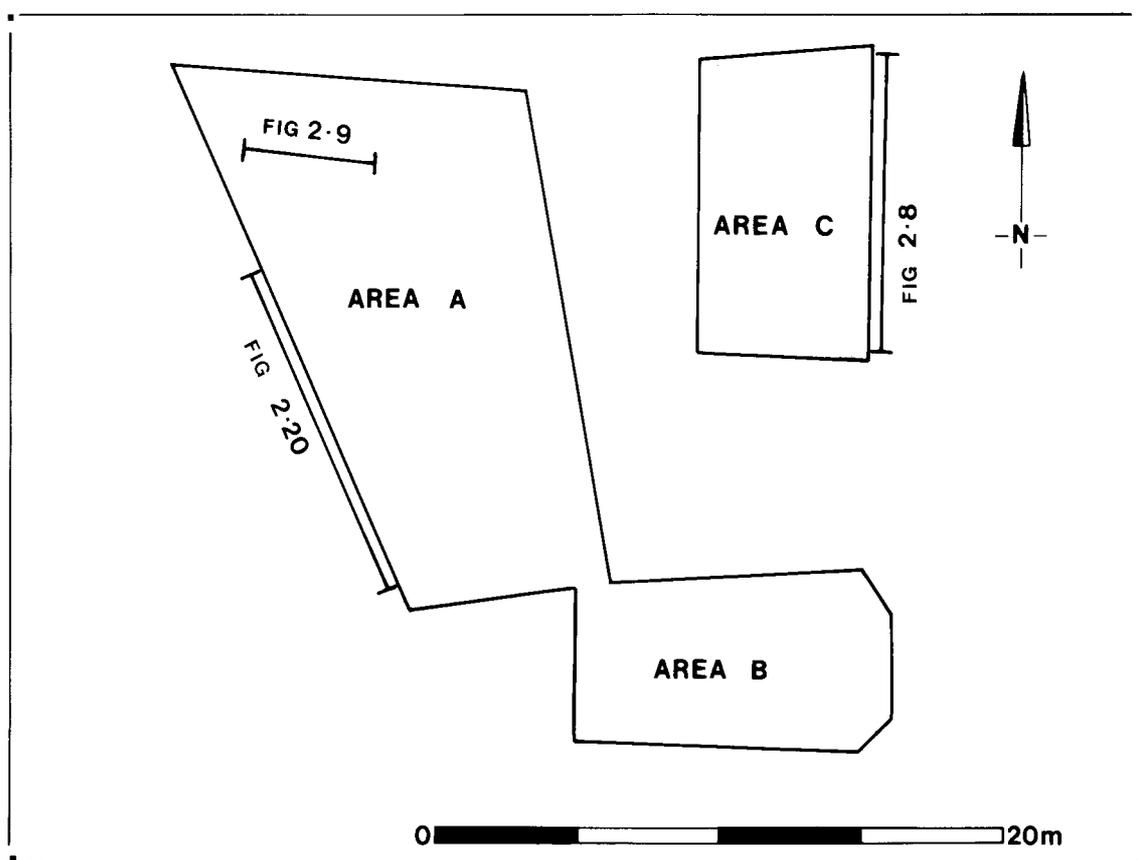


FIG. 5. Site 69. Location of modern features and sections (Fig. 2.8=Fig. 11, Fig. 2.9=Fig. 12, Fig. 2.20=Fig. 23).

was overlain by a dump of mixed topsoil and redeposited Roman strata which represented the upcast from the excavation of a septic tank in the adjacent garden.

Initially the site was sampled by a 2 m wide trial excavation, aligned north-south, and by the cutting back of modern debris from the side of the railway cutting. These operations identified the uppermost Roman deposits and the rampart. The whole site was then cleared with the exception of a c. 2 m wide baulk around the south-east and west edges of the area.

The *intervallum* area was fully excavated, but the well-preserved rampart was not removed in its entirety. A quadrant method of excavation was applied to the latter: the front part of the east end of the rampart was completely excavated, whilst the opposing quadrant, i.e. the rear part of the west end was also substantially removed, but separated from the front area by a 1.5 m baulk. A 1 m wide section was cut across the entire width of the bank adjacent to this baulk.

SITE 69: LOUGHOR ACCESS ROAD (FIGS 3, 5)

To the east of Castle Street the area examined as Site 69 was defined at the time of excavation by Castle Street, the cutting for the Broad oak Colliery mineral railway line to the north, the boundary with 3 Ferry Road to the south and the limit of the rear gardens of 5, 7, and 9 Ferry Road to the east. The total area of this parcel of land was c. 850 m²; it now carries the access road for the river-front area to the north-east of the river crossing.

There was neither historical nor archaeological evidence to indicate that this plot of land ever carried buildings fronting onto Castle Street; it consequently appeared to have been open space since the final abandonment of the fort. The surface condition of the area immediately before excavation displayed a certain amount of rough vegetation on the characteristic slope down to the river. The slope was interrupted by two east-west oriented terraces which formed an approximate continuation westwards of the property boundaries dividing the rear gardens of 5, 7 and 9 Ferry Road. The terraces had not damaged the Roman stratigraphy as their construction was entirely within the often considerable depth of topsoil.

As a result of the confined area of the site as a whole, and the problems of soil disposal, the site was excavated in three separate parts. The initial area (Area A) was opened out as a north–south oriented section (*c.* 120 m²) aligned across the rampart and *intervallum* adjacent to Castle Street. This section was almost fully excavated, but had to be abandoned before final completion on safety grounds. The area was backfilled to enable a second area (Area C) located near the east side of the plot to be investigated. This was a north–south orientated section laid out across the front part of the fort rampart and the ditch system to its north. The excavation examined an area of *c.* 40 m². This site was fully excavated except for the west part of the original rampart. The third area (Area B) was located within the central part of the plot, immediately to the rear of the *intervallum*. The intention was to gain an insight into the internal arrangements of this part of the fort. This was achieved in some measure although the site was only partially excavated. This part of the site, however, lay beyond the limits of road construction and therefore retains the potential for fuller investigation.

In addition to the main areas forming the excavation site, the archaeology of the south-west corner of the site was sampled by means of a small test section dug to determine whether the site of a new garage off the line of the proposed road would cause archaeological damage. However, as the investigation revealed only recent deposits to a depth of *c.* 1.5 m no further work was undertaken.

SITE 57: LAND TO THE REAR OF 1 AND 3 DOCK STREET (FIG. 3)

At the time of excavation the area within which this site was located was triangular in plan, defined to the north by the rear of the houses numbered 1 and 3 Dock Street, to the east by the walls delimiting the back gardens of numbers 14–20 Station Road, and to the south-west by the cutting made to accommodate Loughor Railway Station and the line itself in the mid-nineteenth century. The rear garden of 5 Dock Street was not accessible for excavation, and was in any case very small. The total area of the triangular plot was *c.* 200 m².

The plot was subdivided by the property boundaries between 1, 3, and 5 Dock Street, and also by the fence and hedge which ran along the crest of the railway cutting to separate the rear gardens in Dock Street from that of the converted railway station. Initially an excavation area of *c.* 80 m² was opened out within the boundaries of 1 and 3 Dock Street, following the removal of the dividing wall. The boundary between these gardens and the railway station was subsequently removed to extend the site area to *c.* 120 m². In addition the upper part of the railway cutting was cleared back below the rear gardens of 5 and 7 Dock Street to expose Roman deposits in a section which linked with the main excavation area. Further observations were possible under salvage conditions in the 1989–90 winter, when the houses in Dock Street were demolished and the embankment further cut back to accommodate the southern approach to the new road bridgehead.

As in most other parts of Loughor recent cultivation had caused only minimal damage to the Roman stratigraphy as a result of the depth of topsoil (up to 1 m). The natural slope of the ground from north to south was on a gradient of *c.* 1:10.

In relation to the Roman plan, the site was located at the rear of the rampart defining the southern side of the fort, approximately 15 m to the west of the presumed site of the South Gate and the *via principalis*. A portion of the *intervallum* fell within the limits of the excavation, as did the rear edge of the north–south rampart which was constructed to reduce the area of the fort.

SITE 66: FORMER STATION WORKSHOPS (FIG. 3)

At the time of excavation, Site 66 was defined by the main railway line to the north, and the arc of the former Broadoak Colliery mineral railway line, which ran beneath the main line, to the west, south, and east. The area thus defined was formerly occupied by sidings and the Station Workshops, and had been artificially terraced into the slope to create a level base for these structures. The total area of the site was *c.* 4,000 m², but excavation was highly selective, not least because of the degree of archaeological attrition caused by the railways and associated

works and the fact that the site was not on the line of the new road. The area was covered by coarse vegetation and scrub.

Initially three test sections, each 25 m by 2 m were opened; two of these were aligned approximately north–south, the other east–west. The north–south sections were subsequently widened and joined to give an area of *c.* 500 m², whilst the south end of the remaining area was widened to 5 m and a 2 m by 2 m test pit cut immediately to the west. This was necessitated by the identification of the fort ditch system in the original cutting and the need to confirm this and demonstrate that the ditch was turning to form the south-west angle of the fort defences.

The 1839 Tithe Apportionment Map and accompanying schedule records this area as ‘Stout Wall Field’ perhaps indicating the survival of (or a memory of) traces, below or above ground, of the defensive circuit here up to the construction of the Great Western Railway.

Other than in the immediate vicinity of the ditch system, it was clear that the Roman stratigraphy had been removed by the levelling for the railway and associated works, although it is possible that some extramural features will be preserved beyond the excavated areas in the south and south-western part of the plot of land.

SITE 54: LOWER STATION HOUSE (FIG. 3)

At the time of excavation the area of land within which archaeological investigation took place was approximately triangular, defined to the south and west by the main railway line, to the north by the coarse of the former Broadoak Colliery mineral railway line, and to the east by the scarp created by the cutting of the terrace on which the Stationmaster’s House and part of its garden was constructed. The house (Station House), which was in a derelict condition, occupied much of the site area of *c.* 500 m², whilst ancillary structures, such as a privy and garden paths were also in evidence. Three trial excavations confirmed that the majority of the Roman deposits had been removed by the cutting of the Station House terrace. However, as the spur of glacial outwash gravels dropped away towards the Burry Inlet, some truncated Roman features were recorded in the westernmost part of the site. Accordingly, the trial section here was extended to cover an area of 80 m². The whole area of Site 54 now forms part of the southern approach to the new road bridgehead.

The position of this excavation in relation to the fort is discussed in greater detail below (p. 48), but it seems likely that a bath-house, the corner and stoke-hole of which were identified, was external to the western defences, and that a timber-lined ditch which cut the stoke-hole was a secondary feature of the defensive system. Certainly the information from the south-west angle of the defences identified on Site 66 tends to confirm such an hypothesis.

THE STRUCTURES

THE RAMPART AND FORT WALL

Introduction

An extensive body of data relating to the rampart and fort wall has been gathered by the excavations described here, and by those undertaken by Ling and Ling (1973) at Ferry Road and the Castle Mound. Although some differences of detail are evident between one site and another it is possible to suggest that a standard set of construction techniques was employed in the construction of both the rampart and the fort wall. Although fresh information may emerge from other sites between the time of writing and that of publication, we believe it is important to present our interpretation of the method of rampart construction in some detail, as we have not noted comparable evidence from elsewhere. We hope that the model we propose might be tested at other forts in the future to establish whether it was widely utilised.

The rampart of the fort was examined in greatest detail on Site 55 (PL. I), to the west of Castle Street. Because of more recent disturbance there was no evidence on Site 55 for the mortared stone revetment which was subsequently inserted to face the front of the structure. This feature was, however, well represented on Site 69 to the east of Castle Street.



PLATE I. Site 55: North rampart looking west (2 m scale on crest; 1 m scales in excavated quadrant).

Wherever encountered, the rampart construction is regarded as part of Phase 2, as there is some evidence for initial site clearance and other activity, particularly from Site 57, prior to the laying out of the fort. There was also some chronological depth within the construction of the rampart, as, for example, it was clear that the uprights of the west tower of the North Gate were set in place before the rampart itself was built.

The contexts associated with the addition of the mortared stone revetment were stratigraphically detached from those within the fort defences where the re-surfacing of the *via sagularis* provided a readily identifiable basis for phasing. The most likely period for the construction of the mortared stone revetment is considered in Chapter 4.

The rampart: construction

The rampart, which was constructed on top of a timber corduroy, was composed of five basic units: a low bank of turf mixed with clay which ran along the front of an extended terrace cut into the gravel and sand substrate; a well-constructed angled rear revetment; a series of individual dumps of gravel and sand; bands of turf which separated the gravel dumps; and layers, predominantly of turf, which covered the foregoing components. Whereas these components were thoroughly examined and recorded in plan and section on Site 55, on Site 69 only a 2 m

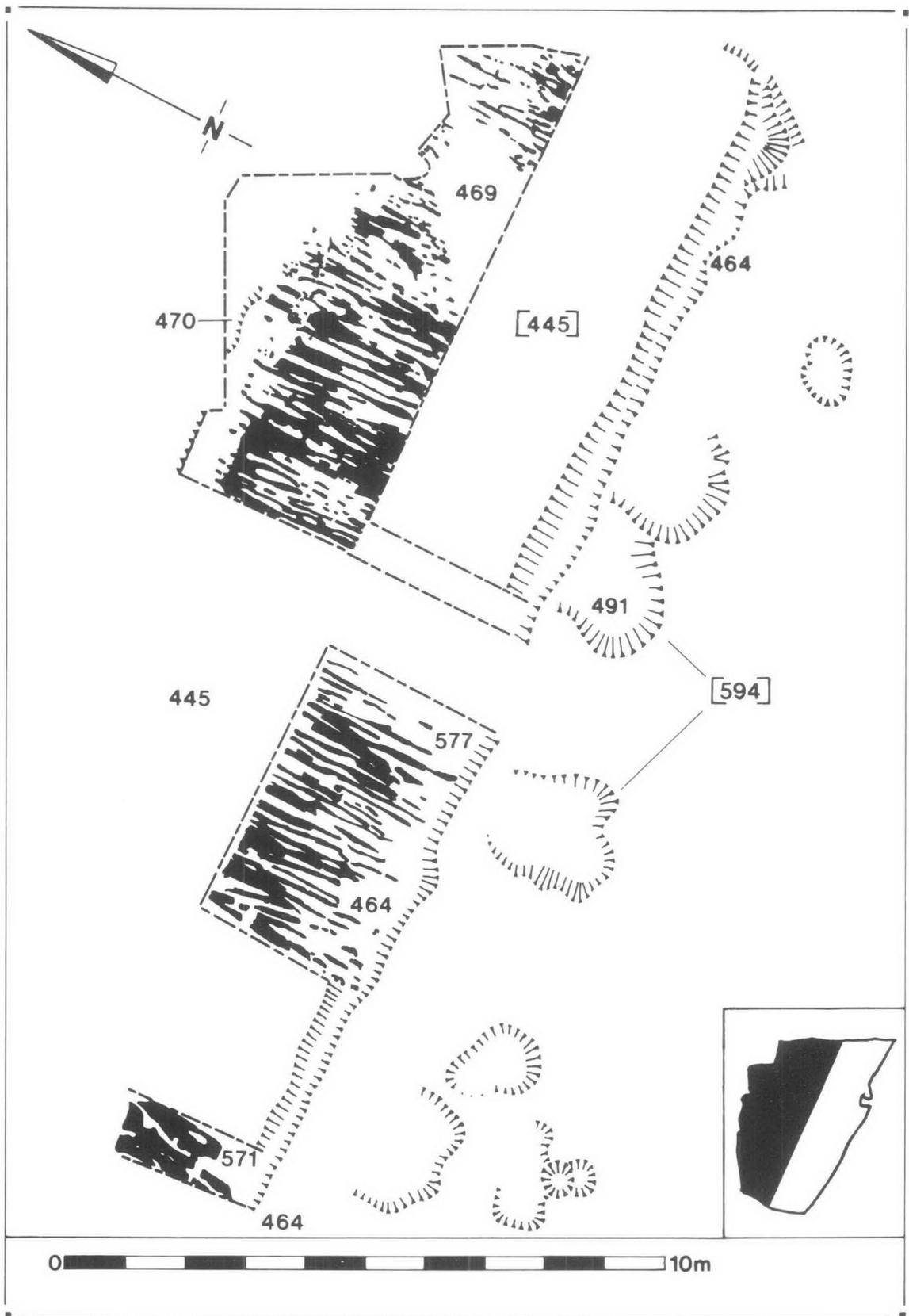


FIG. 6. Site 55: North rampart excavated quadrants and Quarry Pits 594.

wide section was cut through the front part of the rampart and on Site 57 only a very limited area of rampart survived and the greater part of the information was recorded here in section. However, such evidence as was discerned from these sites was generally consistent with that recorded on Site 55.

Terracing (FIGS 6–11)

At each site where the rampart was encountered the sand and gravel substrate sloped sharply. The south–north gradient on Site 55 was *c.* 1:9; the south–north gradient on Site 69 *c.* 1:10; the north–south gradient on Site 57 *c.* 1:10.

In order to obtain a level platform and secure base on which to construct the rampart, terraces were cut into the natural slope. On Site 55 this feature (464), which was oriented east–west, was up to 5.2 m wide and cut into the slope to a depth of up to 0.9 m. The platform was not necessarily exactly level, but always represented an improvement on the often steeply sloping character of the original surface. On Site 55 the platform was fairly level across its width, but sloped up from east to west on its long axis at a gradient of 1:14. The platform appeared to be fairly level on Site 57 (although as only *c.* 4 m² (460) survived, this may not have been truly representative). However on Site 69, and even more particularly at Ferry Road (Ling & Ling 1973, fig. 5) there was a marked slope across the width of the terrace of almost 10°. The rear edge of the terrace was cut at an angle of *c.* 80° on Sites 55 and 69, but had eroded to an angle of *c.* 55° on Site 57.

Wherever the front part of the rampart survived, it was clear that the platform had been extended by the construction of a slight but well-founded counterscarp. On Site 55 the width of the terrace was increased by deposits of cobbles within a matrix of turf and grey-green clay (467, 468 see below and FIG. 7), which were laid to create a counterscarp on the downslope side of the terrace. Those layers had been cut by a later feature (470; FIGS 6, 8) thus making it impossible to establish how far the level platform was continued by the counterscarp. However, the level area was shown to have been extended by *c.* 0.8 m, and the depth of counterscarp material was up to 0.4 m deep. In common with Site 55 the width of the basal platform on Site 69 had been extended to the north by a distance of at least 0.8 m through the creation of a counterscarp composed of rounded cobbles within a matrix of light grey sandy clay with some charcoal flecks (368; FIG. 11) up to *c.* 0.2 m deep. The former extent of this layer could not be established, as it had been cut by the foundation trench for the fort wall.

Ling and Ling's excavation at the north–east angle of the fort also produced positive evidence for what they regarded as two terraces which are illustrated in Section A5 (1973, fig. 5). In the light of information acquired in our own excavations, we would suggest that the upper terrace may have been formed by quarry scoops (see below p. 33) whilst the rampart itself was confined to the lower of the two terraces.

The cutting of a terrace on which to found a rampart is not an especially well documented feature of British forts, still less the creation of a counterscarp platform, the built-up element of which might have been assumed to have been a less than stable base for the front of the rampart. M. J. Jones (1975, 78) notes terracing at Easter Haprew, Ilkley, Llanio, Oakwood, and Slack, but most of these sites display a levelled platform to act as a base for the front part of the rampart only. However, the west defences of the fort at Ilkley do provide a reasonable parallel for the Loughor evidence (Jones, M. J., 1975, 156).

The absence of many parallels for the Loughor rampart terrace is not surprising, as the fort is unusual in being sited on such steeply sloping ground. When allied with the sand and gravel substrate which was the source of much of the material utilised in the rampart, and which was a fairly mobile deposit once disturbed from its natural context, it is clear that topographical and geological factors dictated the need for the terrace. Such factors only seldom applied to Roman forts in Britain, as the vast majority were sited on fairly level ground. However, it may well be that terracing is more common than current evidence suggests, as it would seem logical to even out minor irregularities in ground slope in this way. Such an operation would not necessarily be detected by often partial and narrow sections, which in any case may not have been cut across that part of a fort's defences where the evidence might be detectable. We could therefore expect future excavations to add to the parallels to this aspect of the Loughor defences.

The terrace and counterscarp were overlain by a series of deposits which together formed the substantial surviving traces of the rampart.

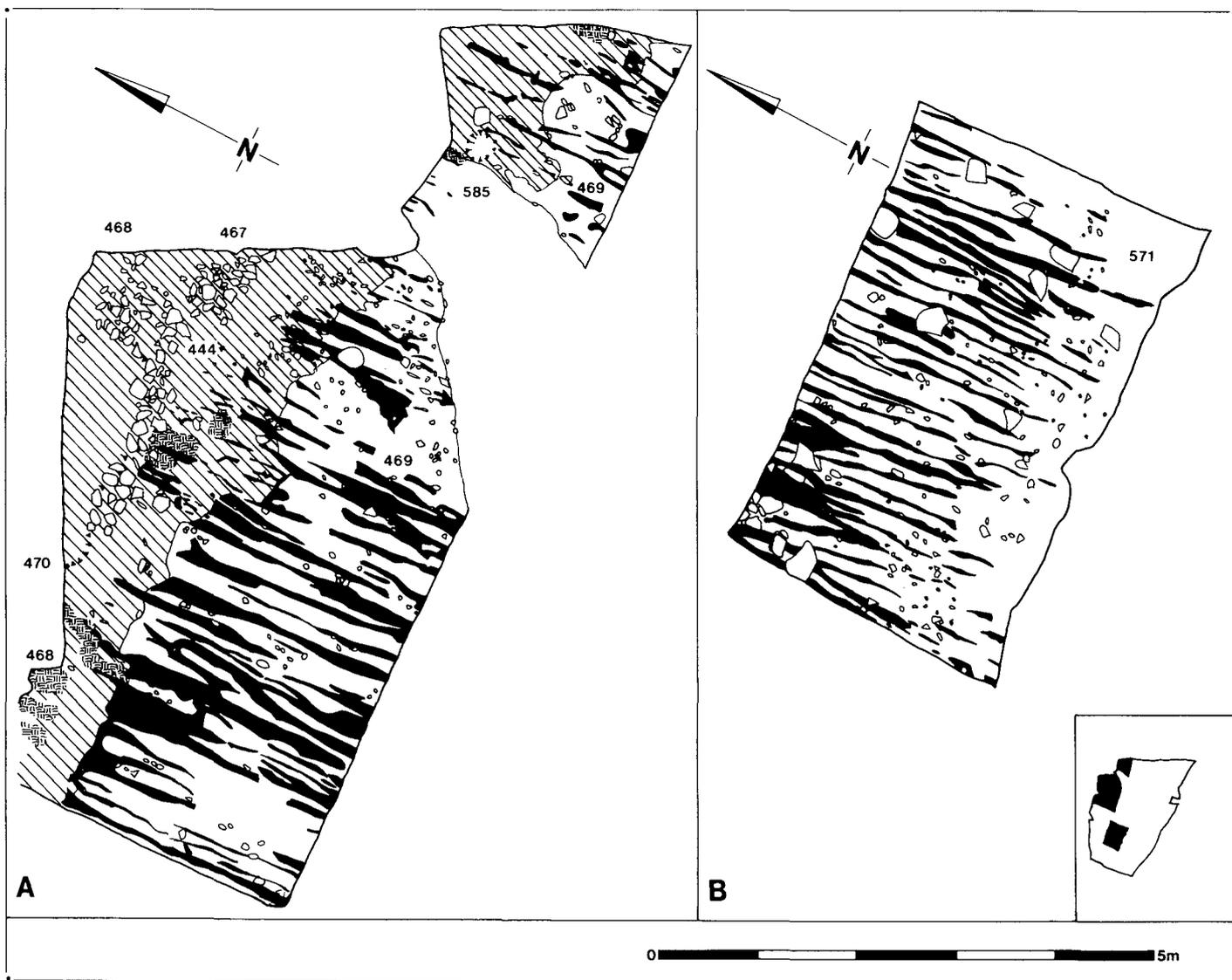


FIG. 7. Site 55: North rampart corduroy: A. North-east quadrant; B. South-west quadrant.

Corduroy (FIGS 6, 7; PLS II, IV)

Clear evidence for a timber 'corduroy' footing for the north rampart was recorded on Sites 69 and 55. Although less well defined, perhaps on account of the limited area available for excavation, a thin (0.01 m) iron pan and staining (57\469) recorded beneath the rear of the south rampart are perhaps strongly indicative of a similar arrangement.

The corduroy survived as brown organic stains often accompanied by iron panning (55\469, 55\571, 55\577, 69\365). The best evidence of the character of the corduroy was recorded on Site 55 to the west of Castle Street, where an area of *c.* 40 m² was exposed. Here, the stains were up to 0.05 m deep, from 0.02 m to 0.20 m in width, and were aligned at approximately right-angles to the long axis of the terrace. The individual stains were closely spaced. It was possible to identify groups of the timber marks arranged on slightly different alignments particularly in the west central part of the rear of the terrace. On Site 69 it was difficult to gain an impression of the spacing between the timbers as the organic stains were not consistently well preserved. In the south-east corner of the section, however, two well preserved stains, 0.10 m wide, set at an angle of *c.* 85° to the terrace and *c.* 0.15 m apart, were noted. In contrast to Site 55, where a single example ran across the full width of the terrace (the dimensions of which are discussed in the section on the metrology of the rampart, below p. 34), there was no evidence of the corduroy extending over the counterscarp part of the platform on Site 69. The other



PLATE II. Site 55: Preserved timber corduroy below north rampart (arrow to *site* north, 0.5 m scales).

timbers clearly did not extend across the platform, whilst the slight variations within the basic alignment of the corduroy appeared to be random.

The timbers appear to have been only roughly trimmed (i.e. chopped into lengths and branches removed), as at the west end of Site 55 iron salt accumulations, which had formed over the original wood and thus mirrored the shape of its upper surface, suggested that the upper surfaces remained rounded (PL. II). It was not clear whether the lower surface was also rounded, and therefore whether split or whole timbers had been employed. In the same part of Site 55, the junction of two stains appeared to be the result of the bifurcation of an original timber, rather than the meeting of two individual components, although clear examples of this latter circumstance could be identified elsewhere. The width of the wood stains either suggests that the trunks of immature trees were used, or reflects woodland type or management. In the absence of species identification it is difficult to develop this discussion further.

No evidence was noted for corduroy at either Ferry Road or the Castle Mound sites (Ling & Ling 1973) but it should be remembered that Sections A1 and A3 only took in the front of the rampart, whilst Section A5 was under 1.5 m wide. In our excavations the corduroy was difficult to identify where it extended over the counterscarp 'toe' of the rampart (the only clear example was recorded on Site 55). Furthermore, Roger Ling has informed us (*in litt.*) that there

was a clear layer of iron panning under the rampart on the Ferry Road site, but the small areas exposed did not reveal the significance. Therefore, for the reasons above (p. 24–5), we believe it is probable that the timber footing was present at all areas so far examined.

The material deposited between the timbers was in most cases inseparable from the overlying deposits of the bank itself. It therefore seems likely that for the most part no special attention was paid to the infill around the timbers, but rather that the various elements of the earthwork were dumped directly on top of them. It should be noted, however, that underlying some parts of the rear revetment on Site 55 sand and gravel had been placed between the logs rather than turf, presumably deliberately, and that on Site 69 a deposit of silvery grey clay (369) up to 0.10 m deep had been laid around the timbers.

Front bank and revetment (FIGS 7, 8, 11; PL. II)

In the north rampart a low bank formed from turf, within which no individual sods were distinguishable, either mixed with a small proportion of green clay and white sandy clay (55\444) or mixed with grey clay with some evidence of iron salts/panning (69\370) was located towards the front of the terrace. Although not especially clearly defined it appeared to have had a rounded profile in section, 1.7–2.0 m wide by 0.6 m high (0.5 m on Site 69 but truncated by later activity). The feature ran parallel to the long axis of the rampart. An indeterminate amount of the front of the bank had been cut away by subsequent activity.

The function of this bank remains uncertain and interpretation is made especially awkward by the fact that it was disturbed by the later cut for the insertion of the fort wall at the front of the rampart. Its position overlying both the corduroy and the toe of the rampart precludes interpretation as a primary 'marker' bank, from which to establish the position of the rampart; it is possible that it was a deliberate dump to mark the position of the front revetment. This is suggested by the fact that the rear edge of the feature coincided with the point at which the overlying material showed a sudden change in the ratio of turf to gravel. Forward of the line of the back of the small bank the amount of turf and white/grey sandy clay in the overlying deposit increased markedly, whilst to the rear the turf gave way almost exclusively to gravel. However, if the low bank was designed as a front revetment marker it would seem to be rather pointless

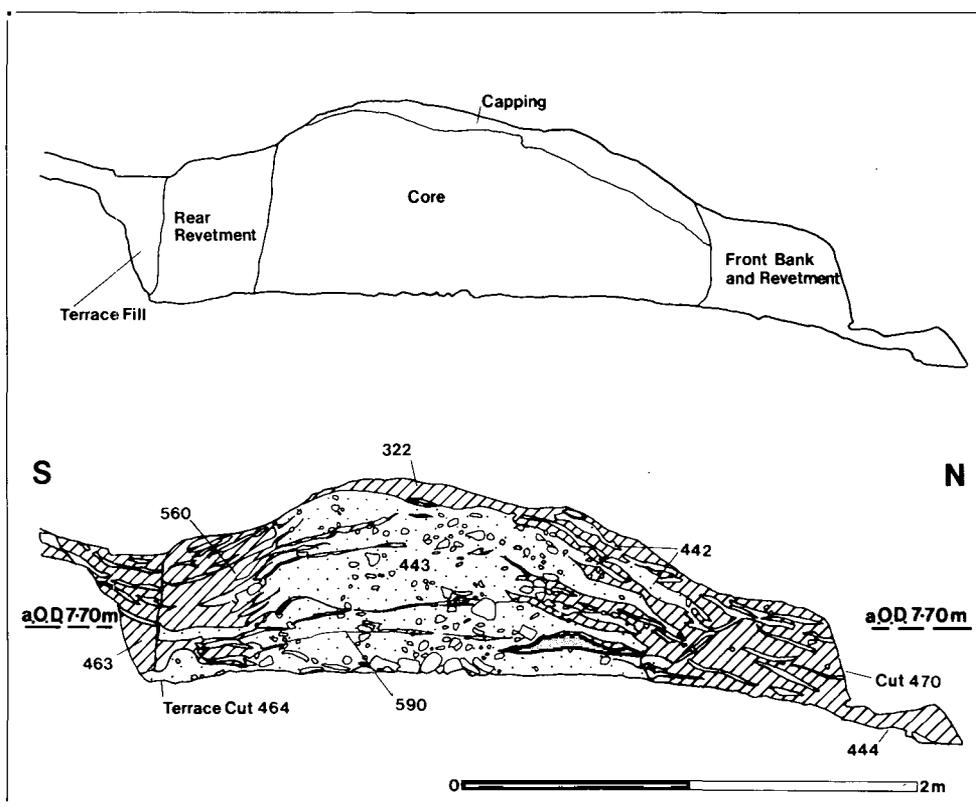


FIG. 8. Site 55: North rampart east-facing section.

– it would have been just as easy to mark out the position with turves laid down to form the base of the revetment itself.

It is perhaps more likely that the feature had a specific structural function. In describing the experimental simulation of a turf rampart at the Lunt, Hogley (1982, 234) states that ‘during the turf wall construction it was discovered that in the lower half of the rampart a turf wall less than 2 m (6ft) thick would bulge dangerously within a few hours’. If the Loughor rampart was fronted by a turf wall, it may be that the bank was designed to prevent such bulges in the front revetment. Although it was comparatively insubstantial, its position and the angle of the near face (c. 30–35%) might have proved useful. Examination of the rampart section on Site 55 (FIG. 8) shows how many of the gravel and turf layers within the body of the rampart rested either wholly or partially on this sloping face. It may therefore have acted as a ‘stop’ to lessen lateral movement, not only in the foot of the rampart front but perhaps at a higher level as well. It should be stressed that we do not find any of the suggested interpretations to be especially convincing; it is probably safest merely to note the existence of the feature and to await any future parallels or suggestions.

Whilst the structure of the rear revetment was made clear by excavation (see below p. 28), the same cannot be said for the front revetment with the possible role of the low bank considered above. However, despite the lack of positive evidence the form of the rampart front as a whole demands consideration. This process is hindered by the fact that part of the front rampart had been cut away during the construction of the later stone fort wall. As a result it is not possible to establish for certain the position and character of the original front face of the rampart, or whether this face was constructed of turf or in timber.

The question of whether a number of fort ramparts in Britain were faced with timber is a contentious one. In some cases, such as Clyro, Lincoln, and Wall (Jones, M. J., 1975, 82), this was definitely the case: in many more examples the evidence is not conclusive, mainly as a result of frequent reconstruction in stone of the front revetment. Such work could easily have destroyed evidence of earlier post-holes or palisade trenches. At Loughor, the fort wall on Site 55 had been robbed (470), but as this had only cut the substrate to a depth of 0.12 m it is certain that the depth of the probable foundations was comparatively shallow (see below p. 38).¹ We believe it is likely that had there been a timber revetment of the primary rampart here, there would have been a reasonable chance of identifying the truncated remains of post-holes or a palisade slot, which by their very nature would have required a firm setting. There was no evidence for timber features in front of or behind the stone wall on any of the sites excavated by Ling and Ling (1973) or by us (excepting features associated with the ditch system rather than the rampart).

We believe there is therefore presumptive evidence in favour of a turf revetment for the primary front face of the rampart. This would be consistent with M. J. Jones’ suggestion (1975, 88) that there may have been a general ruling that turf or clay should be used rather than timber, unless the local soils proved unsuitable. If this presumption is correct, it is nevertheless curious that the surviving evidence for a turf wall is much less convincing at the front of the bank than at the rear. It is unlikely that the most carefully constructed part of the turf wall, i.e. the front metre or so, will have been removed by the stone phase foundation trench. Nevertheless the concentration of turf and clay in the front part of the surviving bank would seem to be a part of the assumed turf wall, and it displays little of the regular character of the rear revetment. This mixed character in the lee of the later wall was present in the sections of rampart examined on both sides of Castle Street and in all the defensive sections dug by Ling and Ling (1973) at the north-east and south-east angles of the fort. There was some evidence at the south-east angle that the mixed nature of the deposit might have been the result of disturbance (Ling & Ling 1973, 197), but elsewhere there was no suggestion of this. It may be that the mixture of turf and clay was considered to be sufficiently strong not to require the laying of individual turfs in the rear part of the front revetment.

In referring to the ‘rear’ of the revetment the assumption is made that the original front face of the rampart was in approximately the same position as the subsequent stone face, i.e. 1.0–1.4 m in front of the back edge of the foundation trench. The proximity of the ditch system

makes it unlikely that the turf front would have been further forward than that of the wall, whilst it is improbable that the face would have been much further back bearing in mind that it would have been battered, probably at a more acute angle than that of the rear revetment (Hobley used a 65 degree angle in the rampart simulation at the Lunt on the basis of evidence from a number of sites (1982, 228–9)). If the arguments about the likely position of the front face of the rampart are accepted, and if it is further accepted that this was in turf rather than timber, it can be estimated that the width of the rampart front on Castle Street was between 2.3 m and 3.1 m. The 0.8 m range in the figures given is partly a result of the possible range in the position of the front of the rampart, and partly as a result of the interleaving of the turf layers with the gravel of the core. This construction technique is described in greater detail below (p. 31).

Rear revetment (FIGS 8, 9, 10, 11; PL. III)

The rear revetment appears to have been constructed at the same time as the rampart core and presumably also the front revetment, as individual layers within each of these components interleaved with those of the others.

In the north rampart the rear revetment was only excavated on Site 55. Here, it (560) varied from 1.0 m to 1.3 m in width and stood for up to 1.2 m above the corduroy. The near edge of the base of the revetment was 0.1 m–0.2 m from the back angle of the terrace. From this line the face of the structure was inclined at a fairly constant gradient of 80°. Just within the eastern limit of excavation, this rear revetment turned through a right-angle to the north. In the south rampart the rear revetment stood to a height of 0.95–1.0 m above the corduroy. The near edge of the base of the revetment was 0.2 m from the back of the angle of the terrace. From this line the face of the structure was inclined at a fairly constant gradient of 85°, but at a height of *c.* 0.9 m above the base of the terrace this gave way to a more gentle gradient which varied from 20° to 40°.

The north rampart revetment was composed mainly of sods of turf, and perhaps white/grey sandy clay, laid in courses. Thin black lines denoting decayed grass were frequently in evidence. Whilst it was relatively straightforward to distinguish the individual courses in section (average thickness 0.05 m), it was not possible to detect the size of the turf/clay blocks in plan, although elsewhere at Loughor these have been measured in section as being *c.* 0.3 m long (Ling & Ling 1973, 107). In the south rampart, the revetment was composed of successive layers of silty grey clay (57\489, 57\490). In both instances this material was reinforced by layers of timber strapping.

It was apparent from the excavations that the relative amount of turf to clay was not consistent around the circuit of the defences. It was not entirely clear from the excavated evidence whether separate blocks of clay (possibly even puddled clay) were used in the construction, or whether the clay content derives from the cutting of turf where underlying estuarine clays were present at a very shallow depth below the ground surface. We believe the latter is perhaps more probable as turf must have been stripped over an extensive area to provide building material for the rampart. Unfortunately the absence of buried soils has resulted in a lack of information on the character of the local environment before the fort was constructed and it is therefore difficult to gauge how much good quality turf free from tree-roots was immediately available. The variable character of the turf in the rampart (from comparatively humic to almost pure estuarine clay) suggests to us that some was stripped from the surface of the glacially deposited ridge, whilst the remainder was derived from the adjacent coastal margins. Thus the rear revetment of southern defences examined on Site 57 was almost entirely of clay with no evidence of turf, whilst to the west of the North Gate there was evidence of fairly humic turf and silty clay with 'grass lines'. We believe that there would have been two principal determining factors in the selection of turf by the fort builders: suitability, and proximity of material. The estuarine clays, with or without a tough salt-marsh type grass cover, would seem to have been ideal in both respects.

The rear revetment of the north rampart was reinforced by at least two layers of timber strapping which were recorded in plan (FIG. 9) and a third which may perhaps be inferred from

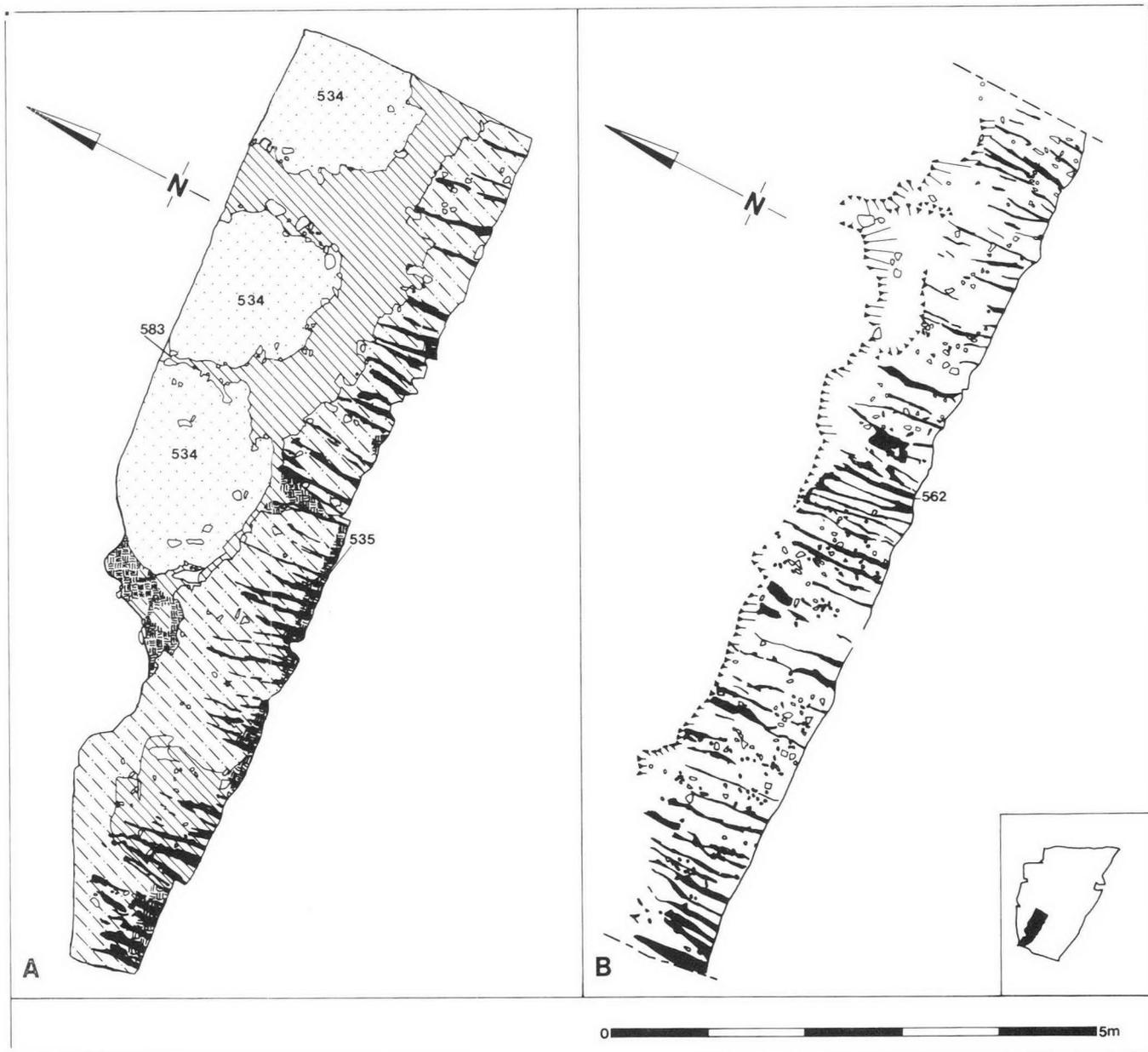


FIG. 9. Site 55: North rampart rear revetment strapping: A. Upper strapping; B. Lower strapping.

the section. The lower strapping (55\562) was *c.* 0.3 m above the level of the corduroy at the outside edge of the revetment and sloped up to about 0.4 m where it merged with the core of the rampart. This gradient was characteristic of other components of the revetment and is discussed below). The strapping itself survived as organic timber stains at right-angles to the long axis of the rampart. The individual stains were up to 1.2 m long, 0.03 m deep, and 0.10 m wide; the marks were closely spaced averaging *c.* 0.1 m apart and in some areas divided or merged. The timbers had been laid within a matrix of sand and gravel which varied from 0.03 m to 0.1 m in depth. The upper layer of strapping (55\535) was essentially similar in character to 55\562 and was located 0.2 m to 0.3 m above the lower. The possible third example of this type of construction was indicated by the presence of a thin sand and gravel deposit between 55\535 and 55\562. Although no timber staining was noted within this context, the presence of

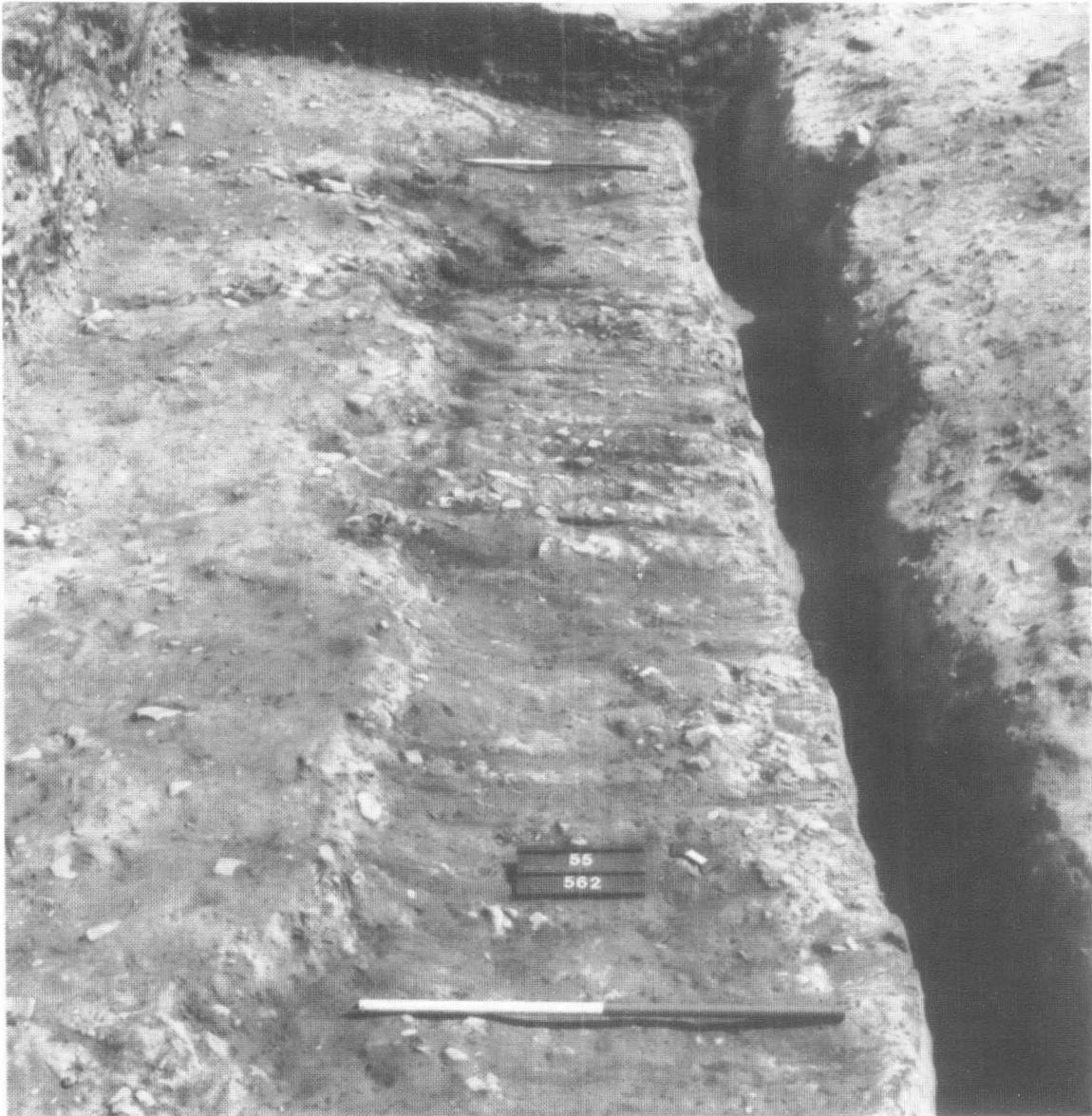


PLATE III. Site 55: North rampart lower timber strapping in rear revetment looking east (1 m scale).

sand and gravel might be regarded as indicative of its former existence. In the south rampart, the revetment strapping was represented by three thin (0.01 m) layers of iron pan (57\488), the lowest of which was *c.* 0.3 m above the corduroy, and the others spaced at comparable intervals. The spacing of the strapping at *c.* 3 m intervals here and in the north rampart is similar to that for the strapping which runs across the east rampart at Strageath (Frere & Wilkes 1990, 17; 16 for fig. 7); it is possible that this vertical separation represents an intended spacing in Roman measurements of 1 *pes Monetalis*.

The strapping in the north rampart did not appear to have continued into the core of the bank. It is possible that the strapping may originally have linked the revetment with the core, but this was not identified during excavation. Any differential settling between the turf and gravel would have made such a link difficult to define. It is also possible to suggest that the sloping nature of the strapping, and indeed most of the component parts of the turf wall, resulted from such differential settling. Where the turf and clay interleaved with the gravel core, the subsidence would have been less than at the rear of the rampart where the gravel was not present. However the slope of the revetment across its width may have been part of the original design. This is suggested by the fact that the layers within the core tilted down towards the front and rear of

the bank; the interleaving layers ought therefore to be angled as well. Away from the core near the face of the turf wall the sods and possible blocks levelled out.

Sand and gravel, rather than turf, was used to infill the strapping, presumably as this material was easier to level off, thus preventing irregularities creeping into the turf wall. Whilst the vertical spacing of the strapping varied in the sections cut in the different parts of the fort, there appeared to be a measure of consistency in the measurement between the corduroy and the lowest level of strapping, and between the lowest level of strapping and that above it. On Site 57 this pattern was again repeated between the second and third layers of strapping. As noted above (p. 28), we suspect that there had probably been a third layer of timber within the rear revetment on Site 55 as well, especially as the excavators' perceptions had not at that stage been sharpened by the clearly preserved evidence encountered during subsequent investigation. We therefore suggest that the insertion of three separate bands of strapping was a standard feature in the construction of the rear revetment, and that the spacing of those bands was dependent on the overall height of the revetment itself, which was somewhat variable (see below).

Rampart core (FIGS 8, 10, 11; PLS II, IV)

The core of the north rampart was examined in detail on Site 55 and in part on Site 69; the core of the south rampart was partly observed on Site 57. The evidence from Site 55 suggested that gravel dumps (443, 534) were originally laid in roughly demarcated sub-rectangular heaps varying in size from 3.2 m by 1.6 m to 4.0 m by 2.0 m with the long axis at right-angles to that of the rampart (see FIG. 9A). All the dumps contained occasional layers and lenses of turf and iron staining. There was one almost continuous layer of iron staining (590; FIG. 8), which averaged 0.02 m in depth and attained a maximum height of 0.35 m above the corduroy, over the centre of the gravel dumps, from where it sloped off gradually in all directions. In some places this context was associated with a thin layer of turf. Other layers of turf were recorded within the gravel, some apparently random, but others spaced at vertical intervals of 0.4 m to 0.6 m. As with the iron panning these layers had a slightly domed profile. The gravel areas were separated from each other by bands of turf (583) which ran at right-angles to the long axis of the rampart and were spaced at an average of 1.8 m apart (PL. IV). The bands, of variable width



PLATE IV. Site 55: North rampart core looking north (2 m scale horizontal; 1 m scale vertical).

(0.5 m–3 m) and laid irregularly, interleaved with individual layers of gravel within the dumps which were otherwise difficult to detect. In some places the gravel had broken through and allowed one heap to partially merge with the next. The bands attained a maximum height of 1.4 m above the level of the corduroy.

These arrangements were paralleled on Site 69 where the corduroy was overlain by a deposit of orange sandy clay and gravel (371) which tailed down towards the front of the rampart from a height of 0.65 m above the level of the corduroy at the south limit of excavation. This context interleaved with layers of grey-black turf (372) which in turn abutted the front rampart bank (370).

Only a small area, less than 2 m², of the core of the south rampart survived on Site 55. It comprised a heap of orange-red sandy gravel (57\454), 1.1 m high, abutted by the rear revetment.

Although there was no direct evidence that the glacial sandy gravel deposits cut away to create the terrace had been utilised in the construction of the rampart, such a procedure would seem to be very logical. Temporary stockpiles of excavated material could have been created whilst the corduroy for the rampart was being laid down. Any such stockpiles may perhaps have been stored upslope so as not to interfere with the excavation of the ditch system, which was presumably another source of material for the rampart.

The structure of the core of the rampart raises a number of points for discussion. To judge by the majority of published accounts of Roman fort ramparts of this date in Britain, excavators have not concerned themselves greatly with this part of the defensive structure. Whilst various forms of revetment are often considered in detail there seems to have been a general assumption that the construction of the core was merely a means to an end, and that it was composed in the main of locally available material arranged in no particular order. The implications of the Loughor evidence are that this integral part of the rampart was constructed in an organized and methodical way, if not with quite the same care and attention as the revetments.

The evidence recorded suggests that the predominantly gravel layers were laid in sub-rectangular dumps; the individual dumps having been originally separated by bands of turf. These heaps were laid with their long axis across the width of the rampart. The domed character of the dumps would have been created during the construction of the rampart through the central part of each heap rising higher than the accompanying layer of the front/rear revetment despite the simultaneous construction.

The layers of iron staining noted within the gravel dumps may have formed as a result of some form of impediment to the percolation of water within the rampart. The sand and gravel was naturally free draining and therefore some other agency is likely to have caused the obstruction. In certain areas the staining had formed in direct contact with a layer of turf, usually above, but at one point below, the organic matter. In other cases, particularly the almost continuous layer of staining in the lower part of the dumps, it was frequently independent of visible deposits other than the sand and gravel. At least two alternative explanations can be put forward to explain the staining. It is possible that the troops working on the rampart deliberately compacted the laid material at various times during construction so that it formed a partial barrier which inhibited water percolation. It is also possible that, as with the mineralized deposits overlying parts of the corduroy, the panning was caused by some form of brushwood layer incorporated within the gravel dumps, the only surviving evidence of which was the staining.

Rampart capping (FIGS 8, 10, 11; PLS II, IV)

The final stage in the construction of the primary rampart was the adding of the further levels of material over the heaps of sand and gravel. The uppermost surviving component of the north rampart on Site 55 was formed by a succession of turf deposits interspersed with thinner layers of gravel (322, 442). Although these deposits had been truncated by later activity, they survived to a thickness of up to 0.7 m in the central area of the bank at a height of up to 1.9 m, above the level of the corduroy. These deposits covered the gravel dumps, the separator bands of turf, and the front and rear of the rampart. The domed appearance of the gravel heaps was evened out by the deposition of these layers along the long axis of the rampart, but in cross-section the

rampart retained a generally convex upper surface. On Site 69 the rampart core was overlain by a series of deposits (309), which were predominantly of black turf and grey clay with occasional bands of gravel up to 0.08 m thick. The overall depth of these deposits was up to *c.* 1.40 m, with the uppermost recorded part 1.95 m above the level of the platform.

These depositions of turf with some gravel helped to even out the undulating profile of the core. Where the state of preservation was good it seemed likely that this stage had been executed in two phases, the earlier to link and bind in with the component parts of the front and rear of the bank and the bands of turf, the later to provide additional elevation to the central part of the structure. It was not clear whether this increased elevation continued towards the front of the bank as, where encountered, this area had been cut away by construction of the stone fort wall.

The upper part of the south rampart was formed from a silty grey clay with some evidence of degraded turf (57\386) and occasional stones; the layer reached a maximum height of *c.* 2 m above the base of the terrace at the point where it had been removed by the railway cutting.

Scoops and pits [55\594] and other activity associated with the rampart (FIGS 6, 8, 10, 22)

A series of features was located immediately to the rear of the north rampart, which was intimately related to the construction of the defences, and which is accordingly described here rather than under the *intervallum* section. Seven shallow pits or scoops had been cut into the natural substrate; they were irregular in shape, variable in size and up to 0.97 m deep. Some of these features had partly cut away the edge of the rampart terrace.

It seems likely that some of the gravel in the upper layers of the rampart core was derived from these features. If, for example, the ditch system had been completed in advance of the rampart, limited quarrying for additional material in what was to become the *intervallum* area would probably have seemed preferable to disturbing the ditch(es). Alternatively, the quarry scoops were dug for convenience at an earlier stage of the rampart construction. Whichever explanation is preferred, there can be little doubt that these features were dug to provide gravel for the rampart.

With the completion of the structure of the rampart itself, it remained to infill the gap between the batter of the rear revetment and the back edge of the terrace. This was achieved in the north rampart through depositing a turf and white-grey sandy shoreline clay layer (55\463; FIG. 8), which extended upslope for a distance of *c.* 4 m so that it also filled the quarry scoops. One of

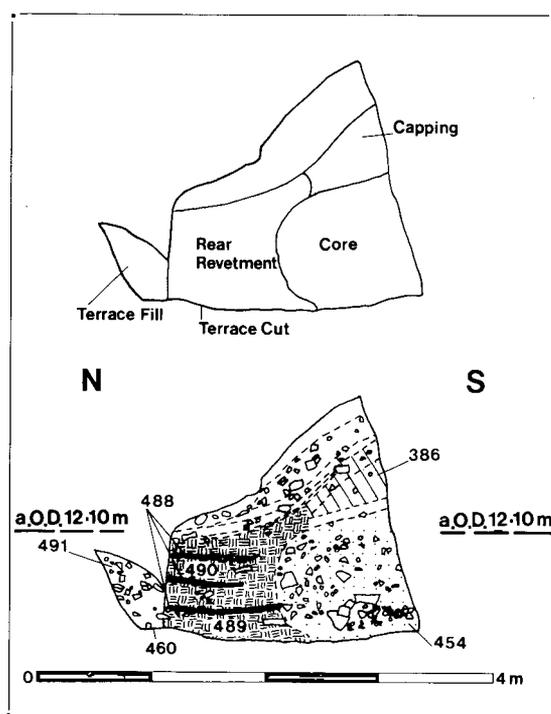


FIG. 10. Site 57: South rampart west-facing section.

the scoops (491) contained a fill (490) which underlay 463; this (*c.* 0.3 m deep) was similar in character to 463 but in addition contained some sand and gravel. The gap between the back of the south rampart and the cut of the terrace was filled by a predominantly gravel deposit (57\491; FIG. 10) up to 0.65 m deep and which appeared to have collapsed from the terrace edge. A series of pits, gullies, and stake-holes (580; FIG. 22) was cut through the natural substrate to the rear of the south rampart. The function of these features is uncertain but they may be connected in some way with the initial clearance of this part of the fort.

The rampart: size, shape and metrology

The basal width of the rampart, assuming the turf wall front coincided approximately with that of the stone phase, varied between the excavated sections. On Site 55 the probable full width of the rampart was 7.20 m; an approximately similar measurement may be estimated on Site 69; Ling and Ling Section A5 (1973, fig. 5), as re-interpreted, gave a width of 8.30 m. It is likely that the increased breadth in the latter case was associated with the fact that the section cut through the north-east angle of the fort.

We believe it is reasonable to suggest an average width for the primary rampart of *c.* 7.2 m; this conforms with the evidence from the northern defences, but whether it applied throughout the defensive circuit remains unknown. The rear revetment excavated on Site 55 averaged 1.2 m in width, although there were variations from 0.9 m to 1.4 m with the greater width sometimes being limited to the basal levels and perhaps representing a wide foundation; the 1.2 m average also applied on Site 57. It is possible to suggest that a unit of 4 Roman feet (*pedes Monetales*, it is assumed) may have been the standard which was laid down for the rear revetment, the range of differences resulting from the success or otherwise of the troops charged with implementation.

There is a possibility that the gravel heaps which formed such a significant part of the rampart core may also have been intended to conform to a set standard. Certainly there was a degree of regularity in their layout, though whether this can be translated into a measured layout interpretation is more difficult to assess. The evidence recorded on Site 55 would, however, be consistent with an original intention to build up measured subrectangular dumps *c.* 3.6 m by 1.8 m, i.e. 12 by 6 pM. Ling and Ling's sections (1973) do not conform to this hypothesis, but it should be remembered that the recorded dimensions would vary immensely depending on where the fairly narrow trenches had been cut in relation to the turf separator bands.

It may be the same basic difficulty of distinguishing between turf separator bands and the front revetment of the rampart which accounts for the apparently wide variation of widths for the revetment which emerges from Ling and Ling's sections. The thickness of turf between identifiable core material and the back edge of the cut of the foundation trench for the later wall varies from 1.8 m (A1) to 3.2 m (A3) and 3.8 m (A5). In our own excavations there was a consistent figure of 1.8 m on Site 55 and *c.* 2.2 m in the more limited area investigated on Site 69.

We believe the most reliable evidence is that recorded on Site 55, on the grounds that this was the only site where an extensive plan view was gained. As suggested above the problems of distinguishing turf in the rampart core from that forming the front revetment may explain the apparent discrepancies on the other sites. We therefore suggest that the original width of the front revetment may have been intended to be 3 m (10 pM), i.e. 1.8 m plus up to 1.2 m removed by the stone phase.

Taking these various measurements together, an overall width for the rampart of 7.8 m would be expected. Whilst the evidence from Site 69, which was necessarily somewhat imprecise, was compatible with this figure, on Site 55 the actual measurement was *c.* 7.2 m. Part of this discrepancy may be the result of a slight overlap between the individual units, but it is also worth considering a slightly narrower width for the rampart front. If a measurement of 2.4 m (8 pM) was employed (this falls within the 2.3–3.1 m band suggested above, p. 28) then a ratio between parts of the rampart may be postulated. The ratio of rear revetment (4 pM) to core (12 pM) to front revetment (8 pM), i.e. 1:3:2, appears to us as an attractive one. We fully

accept that this model may be stretching the evidence too far, but with that important caveat in mind, we believe it is a hypothetical ratio which might be explored at other sites.

Evidence also survived on both sides of Castle Street which enables estimates of the original height of the bank to be given. There was no evidence in any of the excavated areas close to the line of the defences that the rampart had been slighted to any significant degree after the initial abandonment of the fort. The second phase ditch associated with the stone phase in Ling and Ling's A3 section appeared to have silted naturally, and the same seemed to be the case in the ditch system to the east of Castle Street. Similarly there was no evidence of rampart demolition in the *intervallum* areas. When part of the fort was reoccupied, probably during the mid-late third century (below, p. 216), the stone wall which was added to the crest of the rampart was placed directly on the uppermost of the primary deposits described above. It may be that some rampart material was removed to ensure a level platform on which to place the wall but such truncation need only have been minimal or may not have been necessary. Finally there is a possibility that metalling identified on the crest of the rampart to the east of Castle Street may have been a walkway associated with the stone phase (see below p. 43).

In our view, therefore, the maximum recorded height (1.9 m) of the central part of the rampart was probably close to the original dimension. A few centimetres may perhaps be allowed for possible truncation and settlement but we do not believe this to be a particularly significant factor. On the basis of the same arguments outlined above, there is no evidence for any meaningful alteration in the height of the rear revetment (0.9–1.2 m). It may also be reasonably assumed that the front of the rampart was at approximately the same height above terrace level as the centre of the bank. In this area a rampart walkway and a timber parapet might be suggested, the latter probably tied into the upper part of the front revetment. The removal of the upper part of the front of the bank in preparation for the stone phase might have been partly necessitated by the need to remove such a timber structure.

The suggested height for the rampart of little over 2 m above the level of the terrace is much lower than might have been expected particularly in relation to the probable basal width of the structure in excess of 7 m. The 2 m height for the rampart, when topped by the additional front screen, would nevertheless have presented a formidable obstacle. Beyond the rampart the slope of the ground, the ditch(es), and the river estuaries on three out of the four sides of the fort would all have enhanced the defensive qualities of the structure. If the intention was never to build the bank to any greater height, however, it is difficult to imagine why the width was so great. The available evidence does nevertheless point to this wide flat profile.

The profile of the rear of the bank was probably two tiered. As stated above, it is believed that the full height of the rear revetment (excepting settlement) was recorded on both the north and south defences. The upper layers of the centre of the rampart may have been stepped down to this level in what may originally have been a 0.5 m–0.6 m drop. Certainly there is a sharp decrease in level between the centre of the rampart and the rear revetment, which took an almost identical form on both the north and south defences. The combined effect of this tiered arrangement, the low height of the rampart, and the terracing would have been particularly easy access to the rampart walkway from the interior of the fort. Any *ascensus* to provide access to the crest of the rampart may therefore have been in the form of timber ramps rather than steps. It would certainly have been easier to shift artillery into position in this way; the presumed width of the flat top of the rampart of at least 4 m would have been ample to accommodate such equipment.

The fort wall

The unusually well preserved character of the rampart at Loughor is accompanied by equally good evidence for the means by which a mortared stone revetment was added to the front of the bank. M. J. Jones (1975, 100) noted the comparative absence of basic data on this subject in Roman Britain. As there have been few subsequent additions to the corpus in his work, the Loughor evidence is discussed in some detail below.

Evidence for the addition of a mortared, stone-faced revetment to the front of the north



PLATE V. Site 69: Area C: Primary ditch and 'battered' rampart looking east (2 m scale).

rampart described above was encountered on Site 69. Although the method and sequence of construction were clearly identifiable in the archaeological record, the date of this process in relation to other activity within the fort cannot be established stratigraphically, nor can an absolute date be suggested from the archaeological evidence. The wall was fully removed in the eastern part of the site, but elsewhere was only partly examined for reasons of safety. The wall did not survive on Site 55 as it had been comprehensively robbed (470; FIGS 6, 7, 8), probably at the time of the construction of the Broadoak Colliery mineral line, which had physically removed the front of the rampart in the western part of the site and had completely cut it away further to the west. The construction of cellars for the nineteenth-century houses fronting the west side of Castle Street (FIG. 4) had also caused disruption.

The line of the revetment wall for the south rampart lay beyond the confines of Site 57 and only the foundation trench survived on Site 66 (see below p. 39).

Rampart 'battering' (FIG. 11; PL. V)

The evidence from Site 69 indicated that to insert the wall the upper part of the front of the rampart was cut away. The top edge of this cut (174\353) was located an average of *c.* 2.5 m to the rear of the subsequent line of the back edge of the mortared stone wall. The upper part of the cut was steeply angled, and in places undercut, although the latter effect may have been the result of later slippage of rampart material. The cut gradually levelled out, but did not display a regularly contoured slope. The feature attained its greatest depth immediately to the rear of the back edge of the subsequent wall. In this area the base of the feature was in places no more than 0.2 m above the level of the surface of the counterscarp part of the rampart terrace, although in other parts the excavation was less deep. Similar evidence for the battering of the front face of the rampart was noted on Site 55, although the rampart wall, foundations, and foundation trench had not survived.

The cutting back of the upper part of the rampart front was clearly a considerable operation and was executed in a rough and ready fashion as indicated by the irregularity of the void left by the cut. Although evidence of this operation was not recorded at any of the sites previously

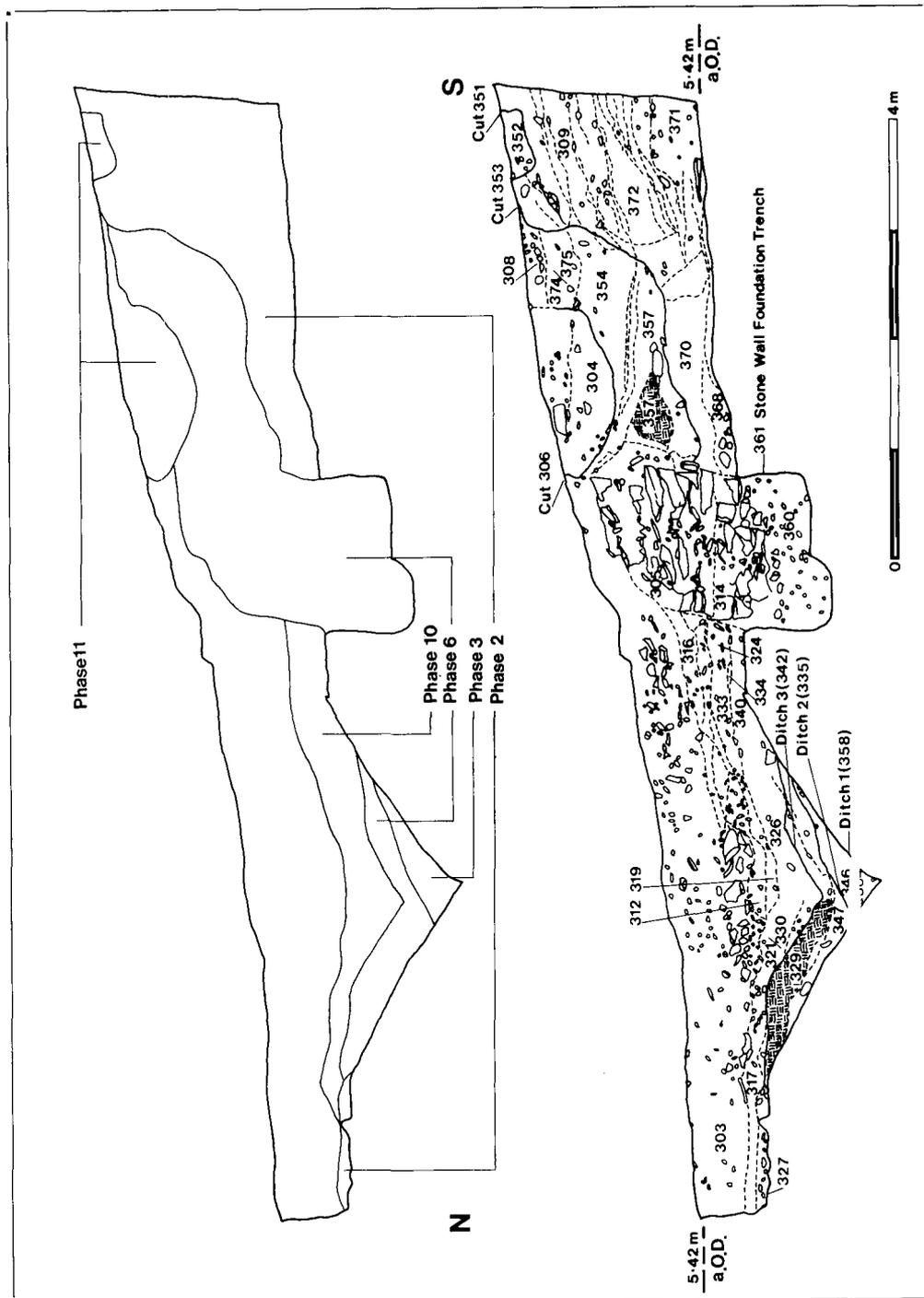


FIG. 11. Site 69: Area C west-facing section.

excavated across the defences (Lewis 1975; Ling & Ling 1979), it should be noted that there were a variety of circumstances – less surviving height to the rampart, greater disturbance caused by subsequent robbing, or the presence of the corner-tower of the south-east angle – at all of these sites, which may have obscured the identification of this activity. Therefore we believe that the suggestions made below are not invalidated by the lack of evidence from the earlier excavations at Loughor.

The need to remove such a large section of the primary rampart was probably determined by a number of factors. One of these would have been the need to remove the timber palisade which was presumably firmly set into the crest of the rampart front to protect the walkway. The walkway itself, if formed of logs rather than metalling, may also have been secured to the structure of the bank, and might have required dismantling to facilitate the removal of the revetment. Another contributory factor may have been the condition of the front of the rampart, about

which we can only speculate, as so much of the evidence was removed by the construction of the stone wall in what must be presumed to be the same location as the turf face. (Certainly there was nothing to suggest that the original rampart extended beyond the line of the later stone face.) If the turf revetment had been subject to slumping or collapse it might have required cutting back for some distance before stable deposits were reached. Two other factors associated with the construction of the stone wall itself may have influenced the scale of the hacking out operation. Firstly the need to secure the stone revetment wall in a deep foundation cut into the substrate (see below) might have resulted in the undermining of the rampart unless the load on its front was reduced; otherwise the dangers to the wall builders, who might easily have been buried by a comparatively modest collapse, would have been considerable. Even with the removal of material from the rampart front, the bottom of the foundation trench was up to 1.45 m below the lowest part of the remaining material. Secondly, during the construction of the stone wall it might have proved useful to have working-space behind the wall as well as on and in front of it; the occurrence of predominantly turfy thin bands of material within the wall structure perhaps adds weight to this suggestion, if these bands are correctly interpreted as trample (see below p. 40).

Foundation trench (FIGS 11, 14, 15; PLS V, VII)

In the north defences, the foundation trench was cut from the variable level left after the removal of the front of the north rampart. On Site 69 the trench (361) was 1.4 m to 1.5 m wide, cut to a depth of up to 0.8 m beneath the level of the sand and gravel substrate to the north, and excavated up to 1.45 m beneath the level of the base of the rampart cut away (353) described above (p. 36). The trench displayed almost vertical sides and a fairly level flat base. However, towards the east end of the excavated section the bottom of the feature had been cut 0.25 m more deeply in its northern half. At the very eastern limit of excavation there was a near-vertical step in the base of the foundation trench which reduced its depth to a maximum of little more than 0.20 m below the level of the sand and gravel substrate to the north and *c.* 0.7 m below the edge of Cut 353. In plan, the terminal of the deeper section of the trench was square-ended whilst in section the base of the more elevated part of the trench was less regular than its deeper counterpart to the west. It is not clear how far to the east the less deeply (*c.* 0.2 m) founded stretch of wall ran, but a similar shallow depth of foundation may have existed to the west of the North Gate, as the robbing of the rampart wall on Site 55 only cut the substrate to a depth of 0.12 m below the level of the counterscarp element of the primary rampart. At the other extreme Ling and Ling (1973, 107) recorded a foundation trench depth of 1.4 m below the toe of the rampart at the south-east angle of the fort (Section A1). (It is, however, possible that this increased depth is attributable in part to the existence of a corner tower.) Ling and Ling recorded a depth of 0.8 m at the north-east angle of the fort (Section A3); this accords well with the similar depth recorded throughout most of the completely excavated section on Site 69. The marked step at the eastern edge of Site 69 might suggest that two different gangs of troops met at this point, or merely reflect the east-west fall of the terrain.

The variability of foundation trench depth is of some interest, particularly as in places the massive masonry structure was apparently so ill-founded as to be virtually 'floating'. This is all the more surprising when it is considered that the rampart which the wall fronted could have exerted considerable stresses on the structure. It is no less surprising that the foundations should have been so methodically created for one section of the wall and almost non-existent in a directly adjacent section. There was no evidence to suggest that the slightly-founded sections were secured in any other way, for example by timber strapping into the rampart. Whilst it may be the case that the poorly-founded part of the wall on Site 69 was no more than a few centimetres wide (the proximity to the edge of excavation preventing the answering of this question), the length on Site 55 would seem to preclude the possibility that some short sections were less well founded than others, and relied on lateral strength for their security. Nor would there seem to be any convincing argument that variations in the character of the superstructure dictated variable foundation design, as the deeper footings on Site 69 were not related to interval-towers

or any other form of notable variation in the structure of the wall. We can do no more than leave this issue unresolved.

As noted earlier, no trace of the south rampart had survived on Site 66. However, a slot (026), 0.75–0.8 m wide and 0.22 m–0.3 m deep, located *c.* 0.4 m to the north of the inner edge of the south ditch must almost certainly be the construction trench for the stone revetment. Although this feature is slightly narrower than the foundation trench for the revetment wall on the north side of the fort, it is difficult to propose an alternative explanation, particularly since its alignment respected the other elements of the southern defences encountered here.

Foundation materials (FIGS 11, 13, 14)

The foundations of the wall on Site 69 had been well constructed in a standardized manner. The lowest level of foundation material consisted of densely packed cobbles and boulders 0.15 m–0.40 m in size (166, 360). The gaps between these stones, which were characteristic of the local glacial and river deposited gravels, were void, although a small quantity of brown clay and turfy textured soil was recorded in a few places. 360 was generally *c.* 0.5 m deep, but lessened to a depth of 0.2 m to the west (166). The upper part of 166 was partly covered and encased in the eastern part of the foundation trench by a pinkish, predominantly lime-based mortar (180), up to 0.15 m deep, which had set extremely firmly. It appeared as if mortar had been poured over the initial cobble filling, the consistency of the mortar-mix determining whether it formed a raft over the cobbles or whether it was able to penetrate and bind the cobbles to a depth of some centimetres. The cobble fill of the trench was overlain by more structured foundations (315), *c.* 0.4 m deep, which comprised a core of glacially worn cobbles up to *c.* 0.2 m large set in a soft off-white-to-cream-coloured mortar, faced externally by large blocks of crudely dressed Lower Pennant Sandstone up to 0.4 m long, and arranged roughly into two to three courses. The facing of the rear of the wall was executed in a much coarser and irregular way, and filled the extension to the rear of the foundation trench (see below, p. 41) although this feature was much less pronounced at this level. The uppermost surface of 315 was partially covered with a patchy deposit of mottled silver grey-blue silty clay and grey-brown turfy textured soil (314), in places up to 0.2 m thick, but mostly varying from 0.05 m to nothing. Where present, the layer tended to be thicker towards the rampart side of the wall.

On Site 55 occasional patches of cobbles (457, 468; FIG. 7 for 468) located at the base of the partially surviving robber trench (470) may have been the remains of the cobble foundation of the fort wall.

The foundation trench of the south rampart wall located on Site 66 contained a single deposit (025; FIG. 15) of dark blue-grey silty clay containing lumps and patches of dark brown turf, but no other obvious foundation material was apparent. It may well be the case that this deposit equates to a similar deposit (314) found above the foundations on Site 69 and that the natural substrate, which was extremely compact here, served as an adequate foundation base. One further point in favour of this argument is that this point of the defensive circuit was located on the tail of the moraine and there would have been no need for a terrace here to support the rampart, but where this occurred on the north defences the rampart platform was extended by the construction of a slight but well-founded counterscarp, and in order not to weaken this it would have been necessary to provide a secure foundation.

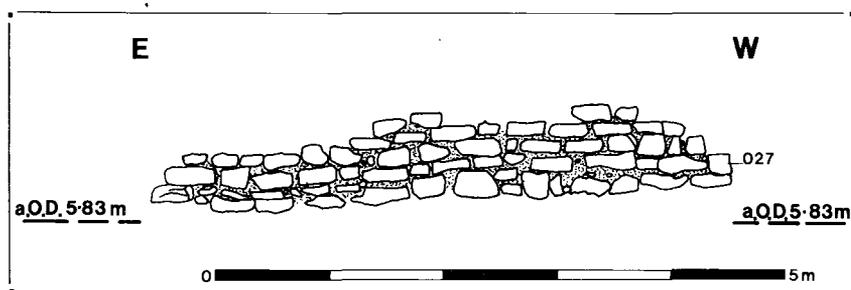


FIG. 12. Site 69: Area A fort wall elevation.



PLATE VI. Site 69 Area C: Fort wall and secondary (Site 69 tertiary) ditch; note 'keying' of fort wall into 'battered' rampart (2 m scale).

Wall (FIGS 11, 12, 13; PL. VI)

The superstructure of the wall was encountered only on Site 69. Here, it (027\305) was composed of a front face of roughly dressed but tolerably well coursed blocks of Lower Pennant Sandstone held in place by a lime mortar, a more irregular rear face of basically the same material, and a core of pitched slabs, also of Lower Pennant Sandstone. The blocks forming the front face averaged 0.12 m–0.15 m in height, were up to 0.5 m long and varied from *c.* 0.15 to 0.30 m in depth. The lowest three courses were each slightly offset from the one below; the arrangements above this level were unclear as a result of later robbing.

The blocks and slabs of the rear revetment were generally slightly larger than those comprising the external face. The core material appeared to have been very carefully structured with the slabs aligned at right-angles to the long axis of the wall, pitched at a steep angle (from *c.* 60°–80°) and arranged in rough courses, with the whole secured by mortar. The interfaces between the core and the front and rear facing were necessarily less well defined, with individual stones wedged in the most practicable way.

Significant differences in the character of the mortar were noted within the structure of the wall. The difference between the pinkish, very hard mortar capping the base level of the foundations, and the much softer, more lime-rich mix which secured the foundation courses has been noted above (p. 39). The first layer of mortar in the superstructure was a fairly hard lime-based mortar with occasional pebbles and small stones up to *c.* 0.06 m in size. This layer was *c.* 0.35 m thick, above which the mix was even harder and very slightly pinkish mauve or grey/white in colour, with occasional air spaces and a very few small pebbles and flecks of lime up to *c.* 5 mm in size. This harder layer of mortar was *c.* 0.35 m thick and was overlain by a patchy intermittent band of soil (373), which, where present, was up to 0.4 m thick. The mortar above this layer was similar in character to that below. In our view the evidence for different mortar mixes, or mortar separated by thin bands of soil, must relate to the method by which the wall was actually built. The turfy layer overlying the offset courses indicates that the binding mortar must have set at least to the extent that the soil had not become intermixed with the mortar. One possible interpretation is that either some turf fell or was washed down from the

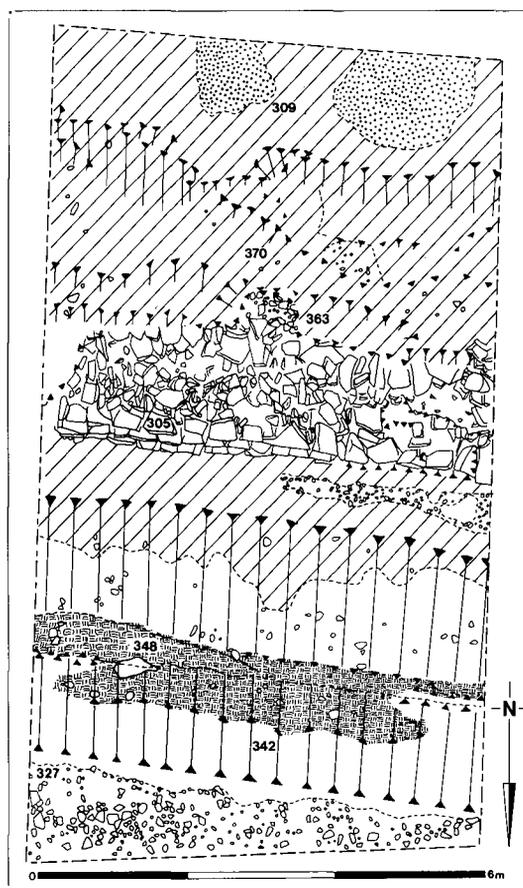


FIG. 13. Site 69: Area C stone defences.

rampart front as the mortar was left to harden. Alternatively, and perhaps more probably, mud adhering to the footwear of the troops who were constructing the superstructure was trampled into the top of the offset courses. This evidence implies the following construction sequence. Initially the front and rear faces of the wall were built up to a level height of 0.35 m. The core material was then carefully laid by inserting mortared slabs and elongated cobbles pitched in steeply angled rough courses, and by wedging of supplementary stone and mortar in the irregular spaces between the backs of the facing stones on both sides of the wall. This process was repeated in a further lift, 0.35 m high, the top of which was defined by a further difference in the mortar constituents; above this level the surviving remains were too incomplete for the construction sequence to be determined further.

Other construction features (FIGS 13, 14; PL. VI)

Another element of structural detail recorded on Site 69 probably related to the way in which the wall was keyed into the structure of the bank. In the central part of the excavated section the back edge of the foundation trench had been cut *c.* 0.3 m further back to form a well-defined subrectangular intrusion (362) into the rampart. The width of this feature was *c.* 0.8 m; its base was at the same level as that of the adjoining areas of the foundation trench, and it was equally steep-sided. The cut was filled with foundation materials (363) in the same way and at the same time as the rest of the trench. However, when the foundation courses were laid the clearly defined subrectangular shape disappeared in favour of a slight bulge in the rear revetment, which was also visible but not especially notable within the superstructure. As a result of the contrasting evidence from the foundation and upper level of the wall it is not entirely clear what the functions of this feature may have been, but it appears to us that it may have been intended to tie in the wall to the structure of the rampart, although whether this was actually achieved is a different matter.

On Site 66, two pits (028, 032; shown as unexcavated on PL. VII) were cut into the upper

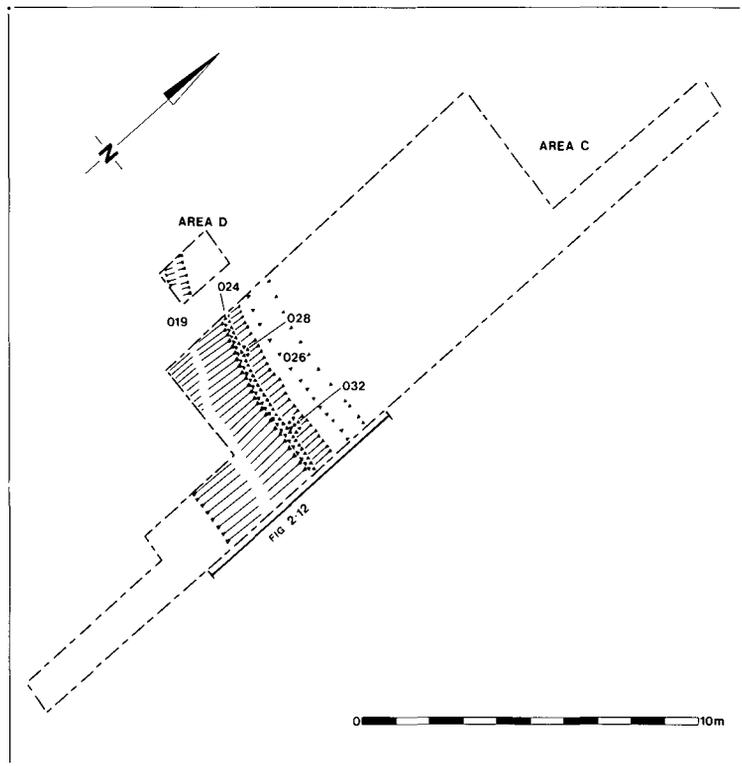


FIG. 14. Site 66: Areas C and D south-west angle of defences (Fig. 2.12=Fig. 15).

lip of the primary defensive ditch. The smaller (0.4 m x 0.3 m x 0.06 m deep) example was ovoid in shape, the larger (0.5 m x 0.6 m x 0.3 m deep) rectangular. The latter example contained a possible post-setting. Both were filled with layers of the blue-grey silt clay. The function of these features is uncertain. They were insufficiently large to have formed part of a tower, and indeed their location on the upper lip of the ditch would have entailed a certain degree of instability in such a structure. An alternative explanation is that they were cut to hold supports for some form of temporary shoring or scaffolding during the construction of the fort wall or more simply for hoarding to prevent material from falling into the secondary ditch.

Fill to rear of wall (FIG. 11; Contexts 69\076, 69\178, 55\092, 55\110, and 55\111 are not illustrated)

The void created to the rear of the fort wall by the removal of the front of the rampart was filled by a series of deposits which were most fully recorded on Site 69 [380]. These lapped against the rear face of the wall. Their character was variable, with frequent changes in composition within both horizontal and vertical planes; the impression given was one of a range of different materials being dumped into the void. Some general trends were however evident. The earliest layers abutting the wall often contained a significant Pennant Sandstone rubble content, with individual blocks of stone up to *c.* 0.3 m. The rubble was generally contained within a dirty matrix (076) of gritty, silty soil with charcoal, gravel, brick and daub fragments, often interleaved with turfy material and silty clays and traces of iron salts. In some places the rubble content of the layer was as high as 40 per cent (198). The filling material on Site 55 [601] was comparable, with predominantly gravel layers (one (092) possibly originating as a wet mix), clay, turf, and stone rubble. The latter material (110) displayed a possible rough face (111) at its north limit.

It is not clear whether the filling took place after the completion of the structure. If the revetment was built to its full height (including the presumed parapet) in the absence of scaffolding, for which there was no evidence (apart from Site 66), it would be logical to suggest that the gap had been filled prior to the construction of the parapet. Alternatively it may be argued that the concentrations of stone in the lower fills of the void derived from material surplus to needs in the finishing of the rampart. Certainly much of the stone was of a character similar to that used in the wall itself, whilst it would not seem to have fulfilled any useful structural

function in terms of the backfilling. However, the volume of stone on Site 55 gave the impression that it may have backed up against the wall in such a way as to form a rough face; this may have been deliberately levelled to stabilize the overlying layers of fill. The general impression derived from these deposits was that the material was dumped without much care and attention. Some of the gravelly deposits were not dissimilar to the presumed 'wet mix' of the road surfaces; on Site 55 in particular, it was as if this material had been poured in from the crest of the rampart. If the refacing of the rampart were taking place at the same time as internal modifications, it may be that this material was indeed left over from the resurfacing of the *via sagularis*.

A conspicuous feature of the rubble where it abutted the back of the wall was the way in which tip lines, and the angle of rest of individual stones, dipped away from the wall at an angle of up to 60 degrees from the horizontal. This angle gradually gave way towards the centre of the void, but in the eastern part of Site 69 in particular it was notable that the majority of the filling layers sloped very slightly away from the back edge of the wall. For the most part these layers were either of turfy soil or silty clays, but there were occasional areas of gravel, charcoal, and other inclusions. Whilst this was comparable to the angle of fill elsewhere on Site 69, to the west of the north gate on Site 55 the fills of Cut 112 all sloped, often quite steeply, from south to north, to the point where they had been removed by modern disturbance. The profile of the fills on Site 69 suggested that they had been subject to a degree of settlement. At the rear of the cut and adjacent to the wall the layers dipped, quite steeply in the latter case. Whilst it is possible that the tip lines indicated filling of the trench from both sides, the lack of evidence for the interleaving of layers which might have been expected argues against this hypothesis. It is therefore likely that the tip lines identified were indicative of subsidence, as well as of the method of filling the gap between the rampart and the fort wall.

Walkway (FIG. 11)

In the eastern part of Site 69 a later cut (310) along the front of the rampart line had removed much of the evidence for the upper filling of the void (353) created by the 'battering' of the rampart except for a narrow band (0.8 m wide) close to the crest of the rampart. Here, the most conspicuous layer (374) was a deposit of yellow-brown sandy gravel averaging *c.* 0.2m deep which was topped by a thin (0.25 m thick) layer of mixed grey silty clay (375) overlain by an apparent metalling deposit (308) of gravel and pebbles *c.* 0.04 m thick. 308 sloped down slightly from north to south and appeared to have slumped slightly into the fills of 353. No evidence survived for these upper fills (374 *et al.*) in the western part of Site 69 or on Site 55.

Although care should be taken not to place too much weight on limited evidence, the strip of what appeared to be metalling overlying the filling of the area to the rear of the wall may have been part of the walkway on the crest of the rampart. It has been argued above (p. 35) that the rampart on both Sites 55 and 69 had survived to nearly its full original height. It may be that the band of possible metalling had been protected as a result of the subsidence of the deposits to the rear of the fort wall. Even allowing for the subsidence, it is unlikely that the original height of the metalling was more than 2 m above the level of the corduroy. Whilst this is a measurement comparable with the 1.9 m between the corduroy and the probably slightly truncated crest of the bank at the south limit of excavation, it should be remembered that the terrace on which the rampart was set sloped from south to north at a gradient of *c.* 1:10 on Site 69. The evidence therefore suggests that the levelled area of the top of the rampart also sloped down at a comparable angle, rather than being built up towards the front to create an entirely level walkway.

Stone phase rampart: size, shape and metrology

The stone wall which was added to the front of the rampart does not appear to have been consistent in width. The foundations varied from 0.98 m wide (Site 66) to 1.5 m wide (Site 69), whilst the wall itself was as little as 0.8 m wide (e.g. Ling & Ling (1973) Section A4, fig. 3) or as much as 1.3 m+ wide (Site 69). Ling and Ling concluded from the north-east and south-east angles of the fort that the wall was 'about a metre in thickness' (1973, 107), whilst

if the evidence from Site 69 was viewed in isolation we would have been tempted to suggest an average width of 1.2 m.

Exactly why there should be such a wide variation in the thickness of the wall is not clear. It may be that the evidence is coloured by the fact that only on Site 69 was a straight length of the wall examined. All the other sections cut by Lewis, Ling and Ling, and ourselves were at, or very close, to the three surviving angles of the fort (north-east, south-east, south-west). On this basis it could be suggested that the average width of the fort wall was *c.* 1.2 m, except at the angles, but we hesitate to propose this in the absence of evidence from other straight alignments. An alternative would be to suggest that two standard widths loosely based on either 3 or 4 Roman feet (pM) were employed for various reasons, not all of which remain apparent today. It is perhaps more likely that we are trying to read too much into the evidence, and that the variations resulted from different gangs of troops working with an emphasis on speed rather than consistency. The differences in the character of the foundations perhaps support this line of thinking.

It is possible to speculate on the overall height of the wall on the basis of the height of the possible metallised rampart walkway on Site 69. As suggested above (p. 43), this was probably *c.* 2 m above the level of the corduroy. The level of the top of the stone phase exterior foundation offset was at about the same level as the corduroy and therefore 2 m plus the height of the parapet may be a reasonable estimate to make. The latter was presumably crenellated with levels at *c.* 1.3–1.5 m and 1.8–2.0 m to judge by simulations such as that at the Lunt (Hobley 1982) giving a total height for the external face of the wall in the range of 3.3 to 3.8 m.

As regards the full width of the rampart during the stone phase, it is likely that this was 7.8 m on Site 55, perhaps slightly over 7.8 m on Site 69, and *c.* 8.3 m at Ferry Road (Ling & Ling Section A5). These measurements do not in our view add any significant information to that which has already been discussed in connection with the primary rampart. Similarly there was no evidence that the overall size and shape of the rampart was modified to any significant extent other than by the addition of the wall itself.

Fort wall: construction date

No datable material was recovered from contexts directly associated with the fort wall, nor could this structure be stratigraphically linked (across the rampart) with the more productive deposits in the immediate interior of the fort or the adjacent ditches. It may not necessarily be assumed that the fort wall was the earliest stone construction in the fort or was contemporary with the much more closely dated (*c.* 105/110) rebuilding of the *praetorium* in stone (see Chapter 3). Ling and Ling (1973) were unable to date the wall precisely, other than to establish that it was likely to be broadly contemporary with Gelligaer, Neath, Pen-y-Gaer, and Tomen-y-Mur (i.e. late Trajanic/early Hadrianic). A few pieces of pottery were recovered from contexts filling the space between the presumed fort wall and the rampart ‘batter’ on Site 55; these include Les Martres-de-Veyre samian and coarse pottery which, with that from other contexts in this phase on Site 57, may be regarded as being Trajanic. However, a note of caution should be exercised here as this area was severely disturbed by modern intrusions and some contamination is possible. Thus, without firm evidence, it is impossible to date the fort wall closely; the likelihood is that it pre- rather than post-dates 110.

THE DITCHES

Introduction

The fort ditches were first identified by Lewis (1969) during his excavation of the medieval castle, which lies above the south-eastern corner of the fort. Further work here and at the north-eastern corner was carried out in 1971–2 (Ling & Ling 1973), but the exact extent of the full defensive circuit remained a matter of conjecture. This has to some degree now been resolved, despite the fact that much of the extreme western part of the fort has been eroded by both human agency and natural action.

The remains of the defensive ditches were encountered principally on Sites 54, 66 (the

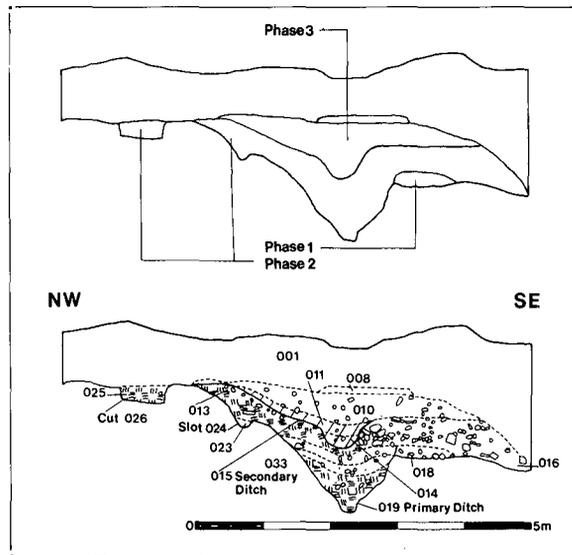


FIG. 15. Site 66: Area C south-west-facing section across defences.

south-west corner), and 69; a further section of the southern ditch was recorded during the watching-brief carried out in 1989.

The evidence outlined below pertains to the first fort; the description of modifications to the early arrangements and the cutting of a new defensive alignment to accompany the reduced fort is reserved for a later section.

The primary ditch (FIGS 11, 14, 15, 16; PLS V, VII)

The primary ditch was almost certainly cut at the same time as the creation of the rampart terrace. The longest section was excavated on Site 69, where part of the northern ditch was encountered in Areas A and C. Here it (208\358) had a distinct 'V-shaped' profile and was 3.5 m wide by 1.25 m deep, somewhat larger than the sections previously excavated (Ling & Ling 1973, 105; Phase 1), where the upper part of the feature had been eroded. The depth of the ditch on Site 69 as measured from the outer lip is some 0.75 m less than that estimated by the Lings and certainly shallower than most recorded examples, which fall in the range 1.2–2.7 m (Jones, M. J., 1975, 106).

However, on Site 66, the section of ditch (019) recorded at the south-west corner was at least 3.10 m wide and 1.75 m deep. The section had an off-set 'V-shaped' profile as a result of the difference in the level of the natural subsoil between the outer and inner edges of 0.85 m; the

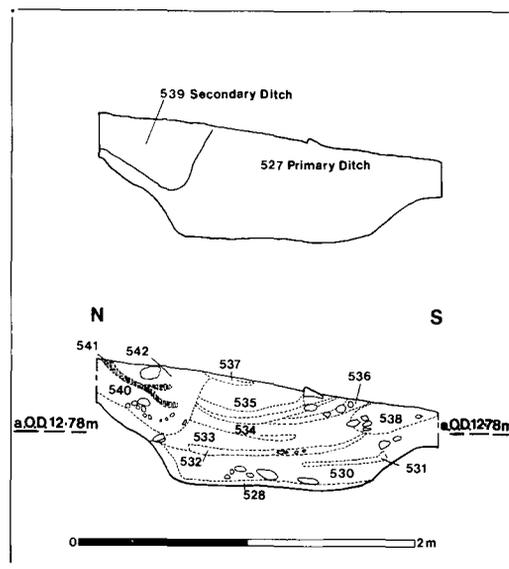


FIG. 16. Site 57: South ditch west-facing section.



PLATE VII. Site 66 Area C: South-west angle of defences looking east (2 m scale).

upper part of the north side of the ditch was slightly convex from the point where the north side was interrupted by the shallow slot 024 (see below p. 47). A basal slot, 0.15–0.30 m wide, was encountered here but not elsewhere.

Part of the south ditch was also located in the course of observations carried out in 1989 during the construction of the new Swansea–Llanelli link-road. The feature (57\527) was located in the road cutting (where it had been cut obliquely in both the vertical and horizontal planes) to the south of the west wall of the rear garden of No. 20 Station Road. The ditch was recorded in section. Unlike the other ditch sections, this feature had gently sloping sides and was flat-bottomed. At the base, it was *c.* 1.2 m wide. The variation in profile between this section of the ditch and those closer to the north-eastern and south-eastern corners of the defences is odd. The ditch here was, however, located close to where the *via principalis* would have left the east gate. If the ditch did not carry on in front of the gate then it may have ended in a rounded and shallower terminal resulting in the flat-bottomed effect observed here, a common enough occurrence (Jones, M. J., 1975, 110). Even if the ditch continued in front of the gate, then it may have become narrower and shallower, as at Rottweil (Planck 1975, 58–9).

The general shallowness of the primary ditches at Loughor is not particularly significant as the local topography would have resulted in a drop from the crest of the rampart to the base of the ditch in excess of 3 m (cf. Ling & Ling 1973, 108 fig. 2, 110 fig. 5; and FIGS 11, 15 here). Another factor which may have determined the depths of the ditches at Loughor was the fact that they were mostly cut through glacial deposits, primarily gravels but with some clay, which may have been subject to erosion (cf. Jones, M. J., 1975, 106–8). Even though the tidal height here would have been lower in Roman times (see Toft in Chapter 1 above p. 9), the water-table may still have limited the depth of the ditches, particularly those cut on the northern side of the fort.

Counterscarp (FIGS 11, 13, 14, 15; PL. VII)

The remains of a truncated counterscarp bank were represented by a layer (66\018) of cobbles and gravel, *c.* 1 m wide and 0.12 m deep, discerned outside the south-western corner of the primary ditch circuit. Such a feature has not been commonly encountered elsewhere at Loughor,

although a shallow deposit of cobbles detected on Site 69 (327\328) may represent the levelled remnants of a similar feature on the north side of the fort, but its presence here perhaps indicates that this part of the defensive circuit needed to be strengthened.

This suggestion is reinforced by the presence of a slot (024) located approximately two-fifths of the way down the inner lip of this part of the ditch. This feature, which was 0.24 m wide and 0.10–0.15 m deep, contained a single stake-hole (not illustrated), possibly indicative of the former presence of a palisade or similar obstacle, a not entirely uncommon feature (Jones, M. J., 1975, 113–14).

Recut of primary ditch (FIG. 11)

From all the sections excavated across the defences evidence has been retrieved (see below) which clearly demonstrates that a new ditch was cut to accompany the revetment of the rampart in stone, but on Site 69 an earlier recut of the primary ditch was also detected in Area C.

A maximum depth of 0.45 m of silt [377] survived in the base of the primary ditch and extended part-way up the inner side, the remainder having been removed by a recut (335). The more rounded base of the new ditch was located some 0.4 m to the north of the primary ditch. The recut was still 3.5 m wide but only 0.95 m deep.

The reason for the recut is not apparent. It must have occurred prior to the construction of the stone revetment, as the southern half was filled with material (339, below) derived from the front turf revetment of the rampart which had been substantially 'battered back' to accept the stone wall (above). Although only a small proportion of the total ditch circuit has been examined, similar recuts have not been located elsewhere at Loughor. Obviously the ditches would have been regularly cleaned out, but this practice is not always readily evident in the archaeological record (Jones, M. J., 1975, 107–9). At Loughor most of the ditches were cut through relatively unstable and permeable substrate, which in places may well have been subject to periodic collapse. In such circumstances it would have been necessary after clearance to reline the sides with some more solid material such as clay, and in turn, in order to ensure that this repair was effective, to extend this repair some distance on either side of the collapsed area. Where this has occurred, unless a long stretch of the ditch has been uncovered, it might not be possible, as is perhaps the case here, to identify with certainty whether the ditch has been recut on a new alignment or simply repaired.

The secondary ditch (FIGS 11, 13, 14, 15, 16, 17, 18; PLS VI, VIII)

Wherever the primary ditch has been examined, its replacement with a second shallower feature has also been attested. In the 1970–71 excavations this activity was associated with the revetting of the rampart in stone (Ling & Ling 1973, 107–9), and this explanation holds true for the areas excavated by us. On the east side of the fort the second ditch was cut on a new alignment (Ling & Ling 1973, 107–9) and this is also probably true for the west side, where the ditch recorded on Site 54 must have replaced an earlier example, which can only have lain to the east of that site. However, on the north and south sides the replacement feature, where encountered, followed virtually the same line as the primary ditch. The reason for this is probably the nature of the local topography, as the sides of the glacial moraine on which the fort is sited fall away sharply to the north and south, whereas the slope to the east and west is relatively gentle. In these circumstances, it would be relatively easy to cut a new defensive line to the east and west, but not on the other sides where the incline was much sharper. This in turn may have been another factor (additional to those outlined above, p. 37) in requiring the extensive 'battering' of the rampart prior to the insertion of the stone revetment.

On Site 69 the recut/repair of the primary ditch was filled [378] and replaced by a new ditch, 2.5 m wide and 0.85 m deep, with a clear ankle-breaker, 0.2 m wide by *c.* 0.1 m deep, at the base (PL. VI).

At the south-western corner of the fort the primary ditch was infilled with deposits consisting of layers of blue-grey silty clay separated by gravels [66\033]. The possible palisade trench also

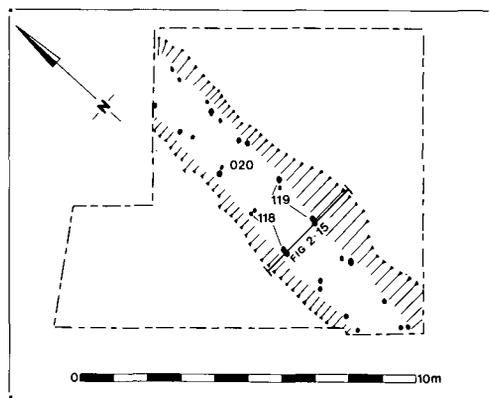


FIG. 17. Site 54: Fort ditch (Fig. 2.15=Fig. 18).

contained a layer (023) of dark blue-grey silt, similar to the deposits filling the ditch. It is not clear whether these accumulations occurred as a result of periodic flooding and silting of the feature coupled with collapse of the sides or as part of a systematic filling of the primary ditch. However, the final group of fills (a sandy clay deposit (012) in turn underlying a dump of gravel and stone (013), which ran down the north side of the ditch as far as a dump of cobbles (016), 0.44 m thick, deposited across the south half of the feature) had the appearance of a deliberate action rather than gradual accumulation. As the cobble dump (016) extended some 1.9 m beyond the south edge of the ditch, it appeared likely that, as on Site 69, the shape of the replacement ditch had been created by deliberately dumping deposits rather than cutting a new feature into the randomly dumped fills of the primary ditch. The size of the new ditch (015) here, measuring 2.35 m wide by 0.8 m deep, compared well with that on Site 69. A basal slot, *c.* 0.3 m wide and 0.24 m deep, was also recorded.

The section of the southern ditch exposed during the 1989 watching-brief was filled with material (Site 57, Contexts 528–537) which, as elsewhere, was presumably derived from the rampart. The north side of the ditch appeared to have been recut (539). This possible secondary ditch was 1.1 m wide, and had a ‘V-shaped’ profile 0.38 m deep.

A ditch which respected the line of the western defences was discerned on Site 54 (FIG. 17) where it cut the flue of an earlier bath-house (see below p. 96). This ditch (020; PL. VIII) had a generally ‘U-shaped’ profile. The upper width for the most part was *c.* 2.2 m, but in places the edges had eroded to give a maximum width of 3.2 m. At the base the width range was 1.4–1.6 m. The depth varied between 0.5 m and 0.8 m. Two parallel lines (118, 119) of stake-holes were driven into the base of either side of the ditch. The stake-holes in each were normally grouped into pairs spaced 1–1.5 m apart and driven to a depth of up to 0.5 m. Where discerned the pairs of stakes were slightly offset from each other. The function of the stake lines is not certain. They may simply have been inserted to provide an additional obstacle in a comparatively shallow ditch, as has been noted elsewhere (Jones, M. J., 1975, 113). However, the substrate through which the ditch was cut here was particularly loose, and it is possible that the arrangement of the parallel lines of offset pairs of stake-holes was designed so that these features could support timber shoring. If so, then the planks for the shoring would have been set between the offset stakes and attached to these uprights, probably with nails, a number of which were recovered from the ditch fills. A factor in favour of this suggestion is that the layers [187 (see FIG. 18, Contexts 056, 085)] of silt and clay filling the central half of the ditch respected the stake lines until at least the bottom half was filled, and were markedly different to the loose gravels and clay [188 (see FIG. 18, Contexts 021, 023, 078)] filling the area between the stake lines and the sides of the ditch. There can be little doubt that this feature is one of the fort ditches. Although no other part of the western defences has been excavated, any reasonable extrapolation of their line from the south-western corner identified on Site 66 must run either through Site 54 or close to the south-east corner of that site. Apart from the early periods of activity on the adjacent Site 53 (see Chapter 3 below p. 117) from which a small section of the *via sagularis* was recorded, no trace of the *intervallum* road was encountered and sufficient space

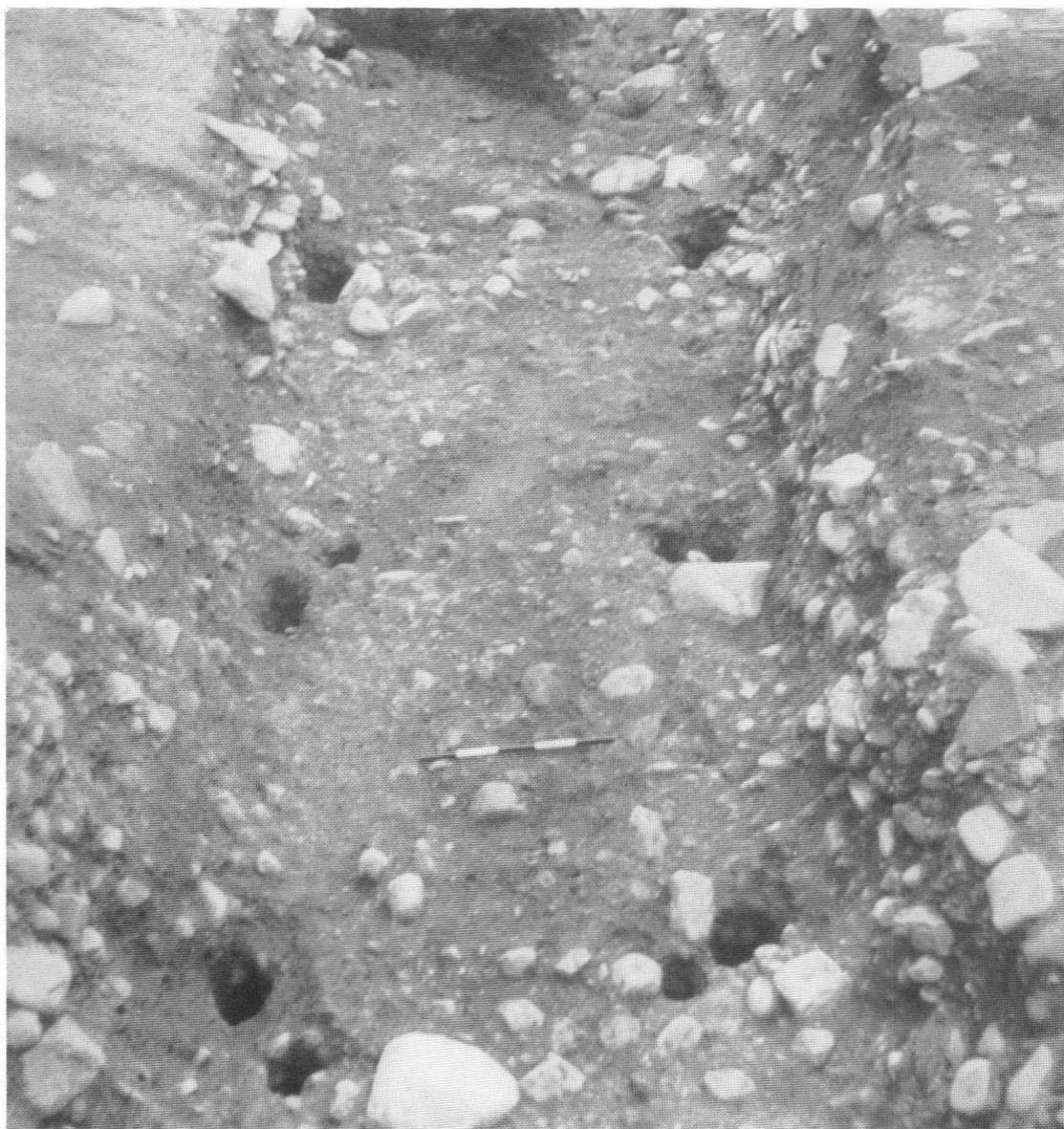


PLATE VIII. Site 54: Fort ditch looking south (1 m scale).

must also have been left for the rampart. The presence of the bath-house, which had been demolished before the ditch was cut, precludes the identification of this ditch as a primary feature.

Counterscarp

The large dump of cobbles (66\016; FIG. 15), partially filling the primary ditch at the south-western corner of the fort but continuing beyond the line of the secondary ditch, may have formed a new counterscarp. This material was perhaps derived from the construction of the stone revetment of the fort rampart.

The secondary ditch: construction date

Small quantities of pottery were recovered from the recut\repaired primary ditch on Site 69 and the fills of the primary ditch on Site 69. In the former samian (Stamp No. 35, Cat. No. 36, and Forms 29 & 30) from 347 would not be inconsistent with a late first-\early second-century date, in the latter samian (No. 51 and a sherd of Les Martres-de-Veyre from 013) must date to the first quarter of the second century. In both cases more precise dating is impossible, but the evidence would be consonant with this activity occurring shortly before or at the same time as the construction of the fort wall.

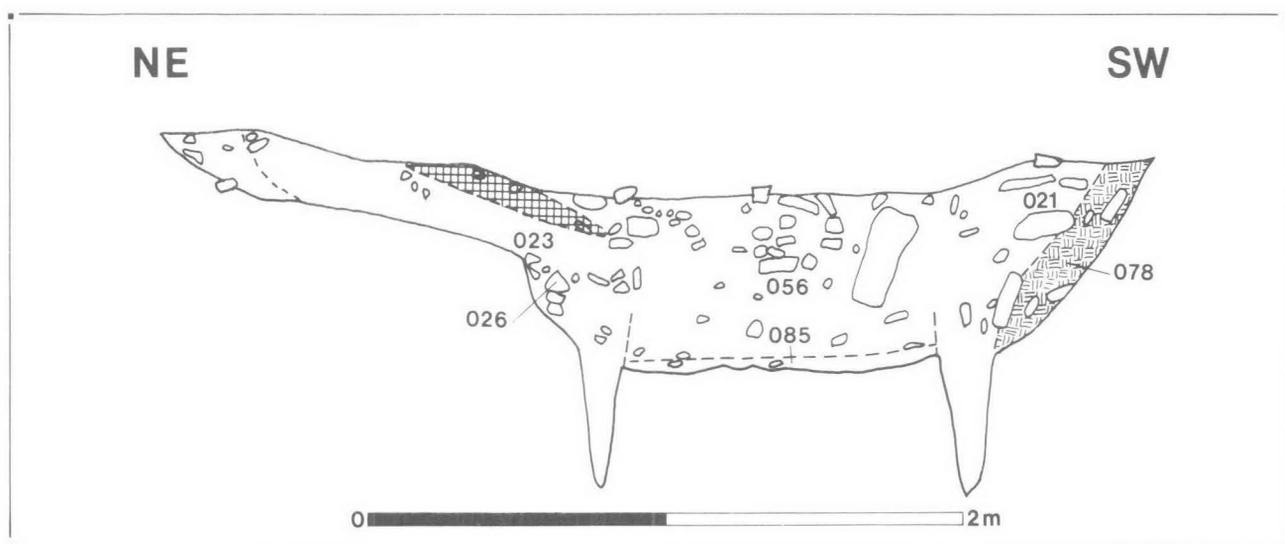


FIG. 18. Site 54: North-facing section across fort ditch.

The secondary ditch fills (FIGS 11, 15, 16, 18)

In all areas excavated it was clear that the secondary ditch had gradually silted up ([57\540–542]; [66\034]; [69\379]; [54\187]; [54\188]), probably after the abandonment of the first period of use of the reduced fort (see below p. 216). This process may have occurred more quickly for the ditches recorded on Sites 54 and 66, which, unless they served to defend an annex to the reduced fort, would have become redundant.

THE WEST TOWER OF THE NORTH GATE (BUILDING 2.1) (FIG. 19; PL. IX)

Part of the west tower of the north gate was recorded near to the eastern edge of Site 55. Four basal elements of this structure were recorded, the remainder lay either beyond the limit of excavation or beneath the part of the rampart that remained unexcavated.

Construction

The foundations of the tower were supported in post-pits, two of which (569, 572) were excavated. 569 was sub-oval in plan 1.2 m by 1.0 m and up to 1.3 m deep, whilst the other pit was sub-circular 1.3 m by 1.2 m and up to 1.11 m deep. It was apparent that Pit 569 had removed part of an earlier feature (573). 573 survived in plan as a crescent-shaped cut 1.0 m by 0.9 m and in section up to 1.34 m deep; a possible post-setting was detected within the fill (563) of red/brown sand and gravel, grey sandy clay, and flecks of charcoal and burnt clay.

Each of the pits contained evidence for a timber post, here represented by partially void post-holes (486, 565), supported in position by a packing (568 and 570) of grey clay, gravel, turf, and waterworn cobbles. Two other post-holes (317, 585) forming part of the structure were also identified, both were set in pits which were not excavated. The post-holes ranged in size from an oval 0.56 m by 0.48 m in diameter (317), through circles of 0.40 m and 0.30 m in diameter (486 and 585 respectively), to an oval 0.32 m by 0.28 m (565). Only 486 and 565 could be excavated fully; their maximum recorded depths were 1.2 m and 1.1 m respectively. Where discerned the material filling the post-holes consisted of mixed sand, gravel, grey-green clay, turf, and fragments of charcoal and burnt daub.

Although the post-pit containing 585 was not excavated, an important stratigraphic relationship was noted, as it was apparent that the deposits (467, 468) forming the toe of the rampart, ran right up to the edge of the post-setting (see FIG. 7A), as did the corduroy (469), and therefore covered both the post-pit and its fill; the later deposits must therefore have been built up around a pre-existing upright for the gate tower.

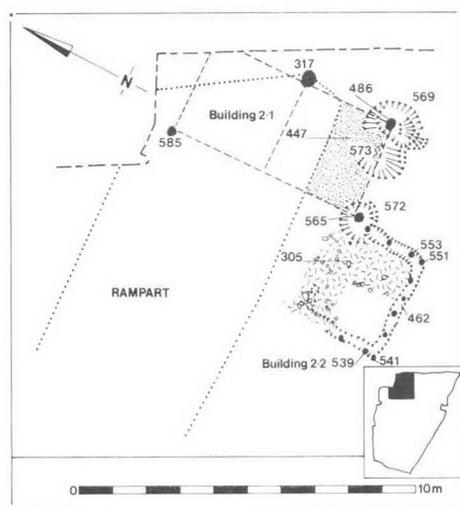


FIG. 19. Site 55: West tower of north gate and Building 2.2.

Plan

The post-holes were regularly spaced. The distance between 317 and 486 (centre to centre) was 2.8 m. Almost at right-angles to a line between these two features the middle of 565 was 2.8 m distant from 486, whilst 585 was 6.1 m from 486.

Although only part of one tower of the gate was excavated, sufficient survives to suggest with reasonable certainty the plan of the gateway. The west tower of the north gate was clearly a six-post rectangular structure measuring 2.8 m by 6.1 m (c. 9.5 pM by 20.6 pM; with a probable intended measurement of 10 pM by 20 pM), set out on a regular grid. The presence of the *via principalis* to the east of the tower and the assumed line of the ditch to the north preclude a large structure. The position of the gate in relation to the known orientation of the fort permits its identification as the *porta principalis dextra*. It is logical to presume that the east tower, lying underneath Castle Street, was of the same order. A plan of this type would fall into Manning and Scott's (1979) Group IV, where the towers extend behind the line of the rampart and are constructed on a 3 m grid with a width to depth ratio of 2:1; here the ratio is slightly different, but was probably intended to be the same.² It is not known whether the gateway, which was probably recessed, had a single or double portal but, given that the known British examples are double-portal structures (Manning & Scott 1979, 27), the latter is more likely.

On most sites the rampart has been slighted too extensively for its relationship with the gate tower to be determined. Loughor is a rare example, where the rampart has survived sufficiently well to show that it was enclosed by part of the gate tower. This is paralleled in one of the towers of the north-east gateway at Pen Llystyn, whilst the opposite situation has been identified at Hod Hill (Manning & Scott 1979, 27–8). The best parallels to our tower are the six-post examples of the principal gates at the contemporary timber fort at Rottweil, where the rear half of the tower was either open or boarded to contain a guard-chamber, and the front half was contained within the rampart (Planck 1975, 57–61).

No evidence survived to suggest whether the tower was entered at ground level to the rear of the rampart or via the rampart walkway, or indeed through both possible entrances, although the presence of a cobble hardstanding (447) (see below p. 53), which lay within the tower and also extended some 1.5 m to the south, perhaps implies that the tower was open at this level. As has already been noted, the rear turf revetment survived here virtually intact to a height of 0.5–0.6 m and any *ascensus* to the rampart, whether incorporated within the tower or adjacent to it, could have been fashioned with relative ease.

Building 2.2 (FIG. 19; PL. IX)

A timber structure (55\584) was built against the south-west corner of the gate tower in the lee of the rampart. This building was sited on the slope down to the tail of the rampart.³

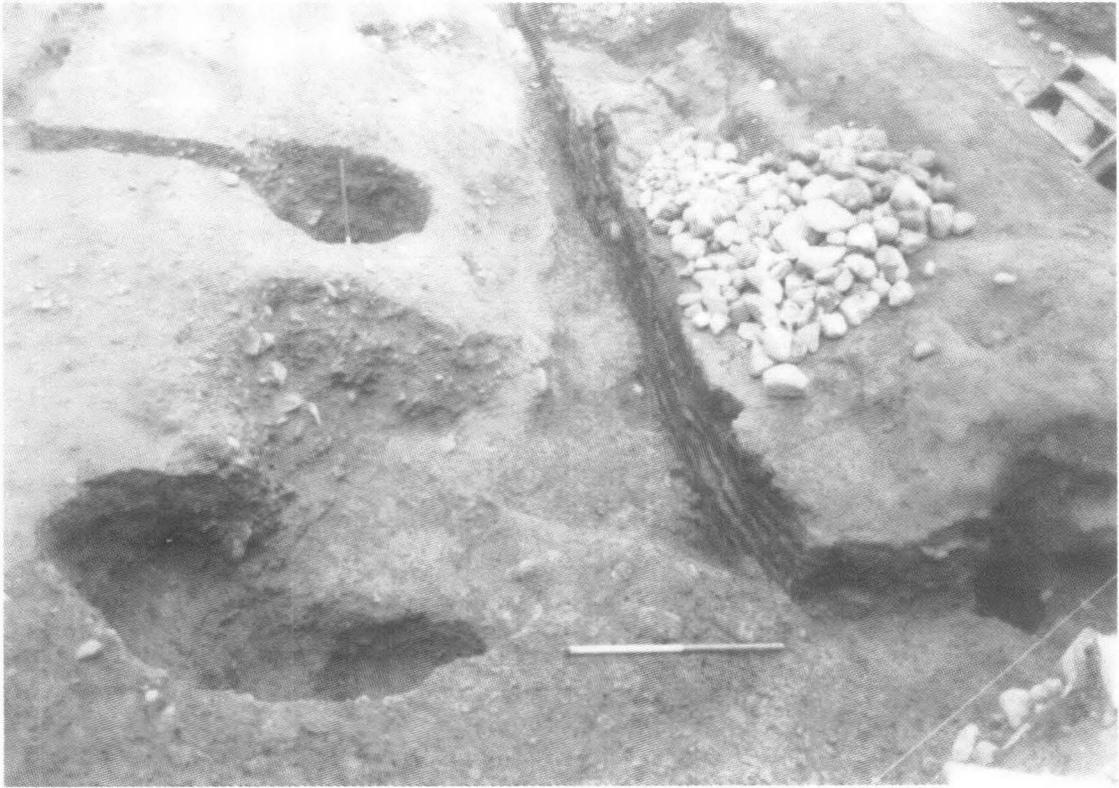


PLATE IX. Site 55: Terminus of north rampart, gate tower, post-pits and Building 2.2 foundation trench (top left-hand corner) looking west (1 m scales).

The walls of this building were founded in a 'U-shaped' post-trench (462), 0.35 m wide by 0.27 m deep with near vertical sides and a flat bottom. This feature cut through a levelling deposit (315), which was restricted in extent to the area of the building and which covered one (567) of the earlier quarry pits. The post-trench ran from the tower post 565, cutting through the fill of the accompanying post-pit, as far as the nineteenth-century passage. This had removed any evidence for the southern side of the structure.

Eleven oval or circular post-settings, ranging from 0.13 m by 0.10 m to 0.20 m by 0.17 m in plan, were surrounded by a sand and gravel layer (461) backfilled into the trench. The post-settings were spaced on average 0.5 m–0.8 m apart, except for two pairs of closely spaced post-holes (539\541 and 551\553) symmetrically placed near the two angles of the trench. It seems likely that these posts were placed as a response to the sharp slope on which the building was sited. The two settings downslope (553, 539) from the corner posts (541, 551) were probably set in place as angled braces for the latter, presumably pegged or jointed together at some point within the superstructure. There was some indication from the plans that 553 as excavated was angled in this way. The posts would have supported wattle-and-daub walls, evidence for which was recovered from the demolition debris (298) sealing the structure.

An off-white sandy clay floor (305), 0.10 m thick, was recorded in the southern half of the building. The floor extended over the fill of the trench as far as the post-settings. Within the building no attempt was made to level the floor; as it stood, the gradient within the 3.2 m internal north-south axis of the building reflected the natural slope of *c.* 1:5. The floor was cut by a single pit (284) of uncertain function, 0.34 m by 0.28 m in plan by 0.18 m deep.

As the post-trench terminated at the south-west corner of the adjacent gate-tower, but the well-defined edge of the clay floor and subsequent demolition deposits continued northwards, in order for these deposits to have been at least partially enclosed to the east, it would have been necessary for the gate-tower to have been walled to ground level. It may logically be assumed that the western section of the post-trench continued, beyond the point where it was cut by

modern disturbance, as far as the back of the rampart terrace, but the form of the north wall of the building can only be conjectured. The existence of such a wall, perhaps fashioned as a removable wooden face, should be presumed as it is unlikely that this side of the structure would have been left open to the elements.

There was no evidence for an entrance into the structure, nor for any doorway connecting Building 2.2 and the gate tower. The space between the upright post-settings would in some cases have been large enough to provide an entrance had one been required, but there was no evidence for any surviving thresholds. The building would, therefore, seem to have been a structure attached, but not internally linked, to the gate tower. Such structures are not common. The best parallel is the lean-to structure attached to the *porta decumana* at Pen Llystyn (Hogg 1968, 115; 192, figs 20, 22). It is possible that the structure served as a guard-chamber additional to those presumably provided within the gate towers, although a storage function is perhaps more likely. It has already been noted that the rampart here continued beneath the lower part of the west gate tower and this must have reduced the available accommodation or storage space. If our suggestion that the north side of the building was removable is accepted, then such a feature would imply a use directly associated with the manning of the rampart. The suggested arrangement would be particularly useful if, for example, any bulky equipment for deployment on the rampart were stored here. Indeed, although the level of the floor was slightly below that of the top of the back of the rampart, when subsidence is taken into account it would probably have been possible to lower a removable wall so as to form a ramp leading straight onto the rampart crest.

Building 2.2 was covered by a deposit (303; not illustrated) of fragmented carbonised wood 0.01 m to 0.02 m thick underlying a layer (298; not illustrated) of burnt daub and carbonised timber debris 0.02 m to 0.03 m thick. Both deposits were contained within the area of the building and, as the gate tower continued in use after the abandonment of Building 2.2, it is suggested that the destruction of the building was deliberately and carefully managed. The lower demolition layer (303) was almost certainly derived from burnt timbers most probably the remains of the roof or perhaps the suggested detachable north wall, and the overlying deposit from the other walls. As the latter was comparatively thin (no more than 0.03 m), it is probable that some of this deposit was removed during or after demolition. In any case, it is more probable that the building was deliberately dismantled, any reusable material removed, and the residue carefully fired on site, rather than that the destruction occurred accidentally, as, firstly, the demolition deposits were contained within the building and, secondly, there was no evidence to suggest that the adjacent gate tower had been fired.

It was not possible to establish whether Building 2.2 was constructed before, during, or after the laying of the *via sagularis* and the *via principalis* (see below p. 54). Examination of the plan shows a kink in the north edge of the *via sagularis* where it skirted Building 2.2, and this would suggest that the structure was in place prior to the construction of the road.

Cobble hardstanding 55\447 (FIG. 19)

In the area to the east of Building 2.2, the natural subsoil and the gate post-pit fills 563, 568, and 570 were overlain by a sub-rectangular cobble spread (447). The gate post-pipes 486 and 565 projected through and alongside this layer respectively. This deposit was probably contemporary with the floor of Building 2.2. It was notable that it occurred both within and beyond (to the south of) the area of the gate tower with no apparent change in composition. In marked contrast, to the west it was contained within the limits of the tower, where it was separated by a small (*c.* 0.4 m) gap from the well-defined edge of the floor of Building 2.2, and where as noted above a timber wall may have served both buildings. It is probable therefore that only the back of the gate tower was open at ground level to provide free entry to the ladders or stairs which presumably afforded access to the upper levels. On this basis, therefore, the cobble spread was probably laid as hardstanding on the ground surface which would have received considerable wear both within and on the approach to the tower.

Stone gateway

No certain evidence survived on either Sites 55 or 69 to indicate that the timber gate was ever replaced in stone. However, the revetment of the rampart in stone is likely to have been accompanied by a similar enhancement of the gateways. An irregular arrangement of small post-holes (251–3, 319, 321; not illustrated), cut into the east end of the rampart crest on Site 55, might conceivably represent the position of scaffolding for such a construction.

THE INTERVALLUM

The *intervallum* was principally examined on Sites 55, 57, and 69; part of the *intervallum* road was also discerned in the early phases (2 & 3) on Site 53.

For ease of reference we have described the excavated remains under three headings:-

The *via sagularis* and adjoining roads;

Features and structures found between the *via sagularis* and the rear of the rampart;

Other features and structures.

THE VIA SAGULARIS AND ADJOINING ROADS

The *via sagularis*

Marking-out features (FIGS 20, 21, 22)

The location of the earliest *via sagularis* surfaces was defined by marking-out features. On the Castle Street site two lines of driven stakes (441, 565) were located. The northern line (575) was set at a slight angle to and 3.6 m–4 m from the back edge of the cut of the rampart terrace (464). It extended from a point in line with the rampart terminal for a distance of 7.3 m. The 22 stake-holes recorded were irregularly spaced at intervals between 0.20 m (centre to centre) and 0.72 m. Their shape and size was consistent; they were sub-circular and averaged 0.07 m in diameter and 0.16 m deep. In addition to the stake-holes, and only slightly offset from the

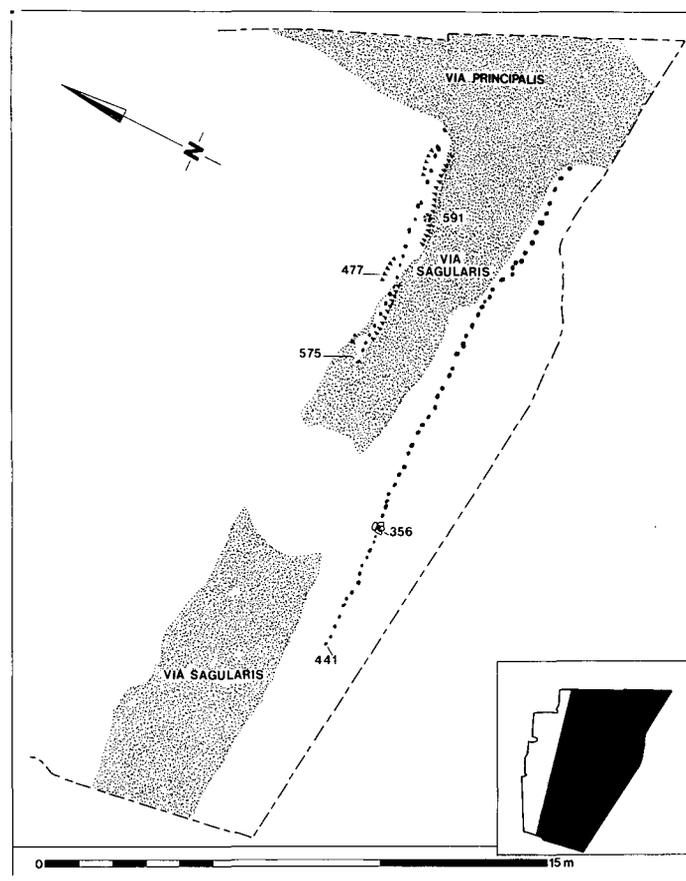


FIG. 20. Site 55: Marking-out Slots 441, 575, *via sagularis*, and *via principalis*.

line, was a larger but shallower feature (591) 0.28 m in diameter and 0.10 m deep. The stake-holes although clearly linear in arrangement did not form an exactly straight line and wavered within a 0.20 m wide corridor. Most of the stakes forming 575 appeared to have been driven through a shallow gully (477) up to 0.70 m wide and 0.18 m deep, although the exact relationship between the contexts was not determined during excavation. For much of its length 477 was more of a shallow scarp into the slope than a gully. The feature ran at a slight angle to the alignment of the rampart and was filled with a grey-green silt containing grit and gravel (475).

The other stake line (441) defined the south side of the *via sagularis*. It extended over a total distance of 15.6 m. The 57 stake-holes identified were closely but irregularly spaced at intervals varying from as little as 0.16 m to no more than 0.40 m. Their shape and size was consistent. They were sub-circular and averaged 0.11 m in diameter and 0.25 m deep. The top of one of the features (356) was packed with rounded cobbles up to 0.20 m large and was slightly deeper at 0.34 m. As with 575, although there was a clear linear arrangement the stake-holes were not all exactly in line. The best example of this was 4.2 m from the east end of 441 where there was an overlapping offset in the arrangement of the stakes. At this point the continuation of the features westwards was on a line *c.* 0.30 m to the north of the eastern section. Three stake-holes formed a link between the two alignments. Similarly on either side of the post-setting 356 there seemed to be a smaller offset. Those stake-holes to the west of 356 were on a line slightly further to the south than those to the east.

The probable emplacement of part of 575 through Gully 477 reflects the fact that the road bed had a 1:5 gradient. The road surfaces, by their character (see below p. 56–61), seem likely to have been laid in a wet mix of sand and gravel. Consequently, it would have been necessary to retain this mix in place, perhaps here by boards attached to the stakes, until it had dried. On the north side of the road, this shoring would also have helped to retain in place part of a kerb (450–2).

It may be that the line of stakes 441 fulfilled a similar function; however it seems more likely that on the higher side of the road there would have been less risk of the road surface material spreading and that this feature is best interpreted as a simple marker line. Another possibility is that 441 formed a fence line alongside the road. There does not seem to be any good reason for such a structure and few parallels can be cited. If the ‘fence’ was aimed at containment it is curious that there was no sign of it’s turning to run alongside the west edge of the *via principalis*

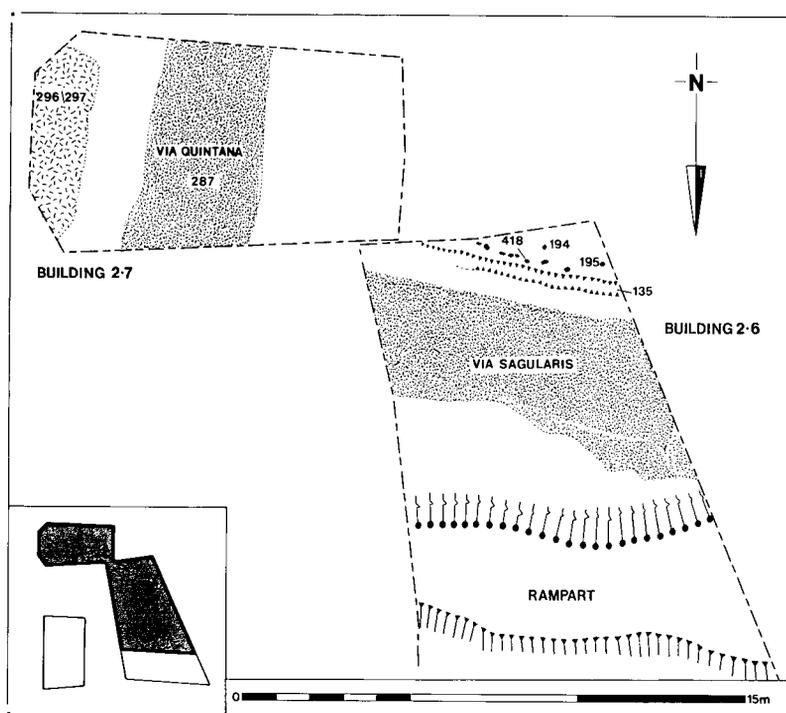


FIG. 21. Site 69: Marking-out Slot 418, *via sagularis*, *via quintana*, and Buildings 2.6, 2.7.

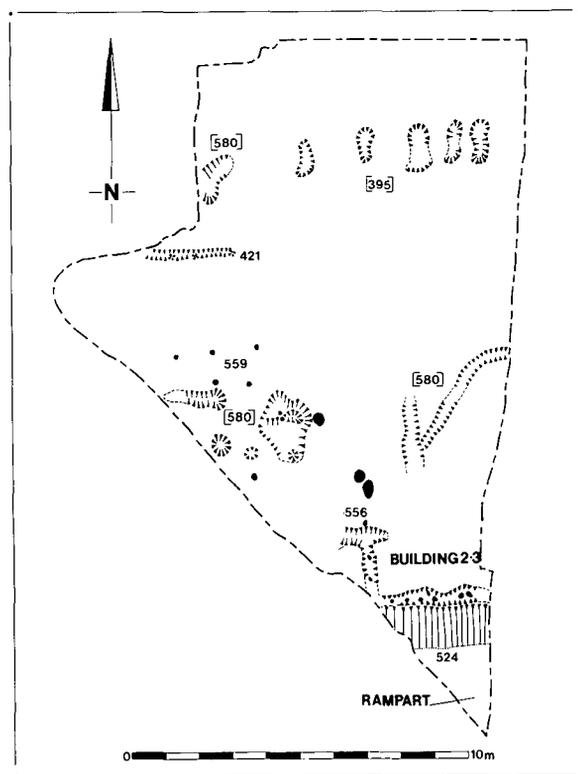


FIG. 22. Site 57: Phases 1 and 2.

and that the line stopped, again without a return, at its western end. The 15.6 m length of 441 may well therefore provide a reliable indicator of the distance between the west edge of the *via principalis* and the east edge of the first interval road to its west (see below p. 61).

On Site 69 only the south side of the *via sagularis* was marked out in advance of the laying of the road. Here, an east–west line (418) of eight small oval-shaped stake-holes, in plan 0.06 m by 0.14 m on average and 0.06–0.12 m deep, was located at the south end of Area A. Two further features (194, 195) of similar dimensions were recorded 0.3 m to the south of 418. All of the stake-holes were covered by the primary *via sagularis* surface.

On Site 57 the marking-out features defining the north side of the *via sagularis* were set in a shallow (0.05–0.10 m) clay-filled slot (421), similar to that defining the north side of the *via praetoria* on Site 53 (see Chapter 3, Phase 1).

On all sites where these features were encountered they are ascribed to the first phase of activity.

Primary surface (FIGS 20, 21, 22, 23, 25, 27)

On Site 55 the first *via sagularis* surface was formed from a layer of small stones, up to 0.7 m in size, densely concentrated within a matrix of yellow sand and grit and reddish brown silty sand with some grey clay (454). The surface was for the most part of high quality but was patchy in parts as a result of later disturbance. It had a maximum width of 3 m. The surface overlay a site clearance feature 472 and in places the layer of turf (463) at the rear of the rampart, but otherwise rested directly on the natural subsoil.

To the east of the north gate the primary *via sagularis* surface (69\161 and 179) was of similar composition to that on Site 55, but was 4.1 m wide. On the south side of the fort the primary *via sagularis* surface (57\309 and 377) was formed from small rounded cobbles set in a yellow-brown sand silt. Here, the road was *c.* 6 m wide and 0.02–0.05 m thick. Part of the west section of the *intervallum* road was found on Site 53 (see Chapter 3, Phase 2).

The variation in the width of the *intervallum* road at different points around its circuit was probably dictated by the space needed for adjacent structures. As noted below (p. 57), in later phases the *intervallum* road became narrower on the south side of the fort, and at one point was effectively blocked, whereas on the north side the primary surface was widened.

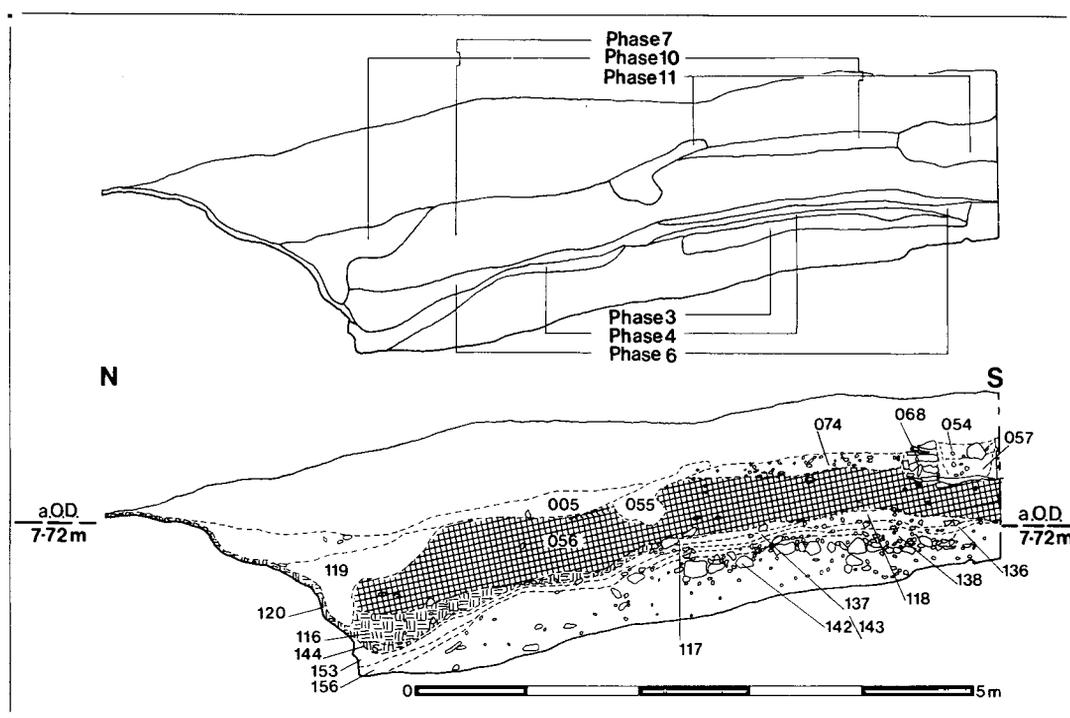


FIG. 23. Site 69: Area A east-facing section.

Construction phase

On Site 69 the construction of the *via sagularis* may have occurred either at the same time or shortly after the construction of the rampart. On Site 55 the fact that the first surface overlay the turf filling the rear of the rampart terrace indicates that the road here must post-date the completion of the rampart construction; it was certainly later than the construction of the gate tower. It is therefore placed in Phases 3 and 2 on Sites 55 and 69 respectively. On Site 57, the construction of the *via sagularis* occurred in Phase 4, where it covered several features associated with the clearance of this part of the fort (above p. 33) and the remains of a small structure (Building 2.3; below p. 62) and associated features to the rear of the rampart.

Later surfaces

The *via sagularis* on the north side of the fort was shown, both to the east and west of the north gate, to have been resurfaced on four occasions during the occupation of the first fort. On Site 57, only one resurfacing was recorded, which effectively reduced the width of the road. The new road here was subsequently blocked by the construction of a latrine (Building 2.4, see below p. 67). It is assumed that the resurfacing of the north interval road on either side of the *via principalis* was contemporary, although this cannot be proved. Likewise the re-laying probably occurred during major refurbishments of the fort (see Chapters 3 and 4 below, *passim*; and 4 for their assignment to particular periods of activity. Most, but not all of the *intervallum* road resurfacings, levelling deposits, and make-ups appear on the section drawings accompanying this chapter).

North via sagularis first resurfacing (FIGS 23, 24)

The first *intervallum* road underlay layers (55\297, 69\420) of clay and turf (55\288). These deposits were covered by a 'make-up', 0.2 m thick, formed from cobbles and stones set in grey-orange silt (55\300, 69\143) lying below a new road surface of loosely packed gravel on Site 69 (142), which was up to 4.2 m wide, and a dense concentration of small stones set in a mixture of sand and silt on Site 55 (290-2). To the west of the *via principalis* the *via sagularis* was between 4.5 m and 5.0 m in width.

The surface was laid in Phase 3 on Site 69 and Phase 4 on Site 55.

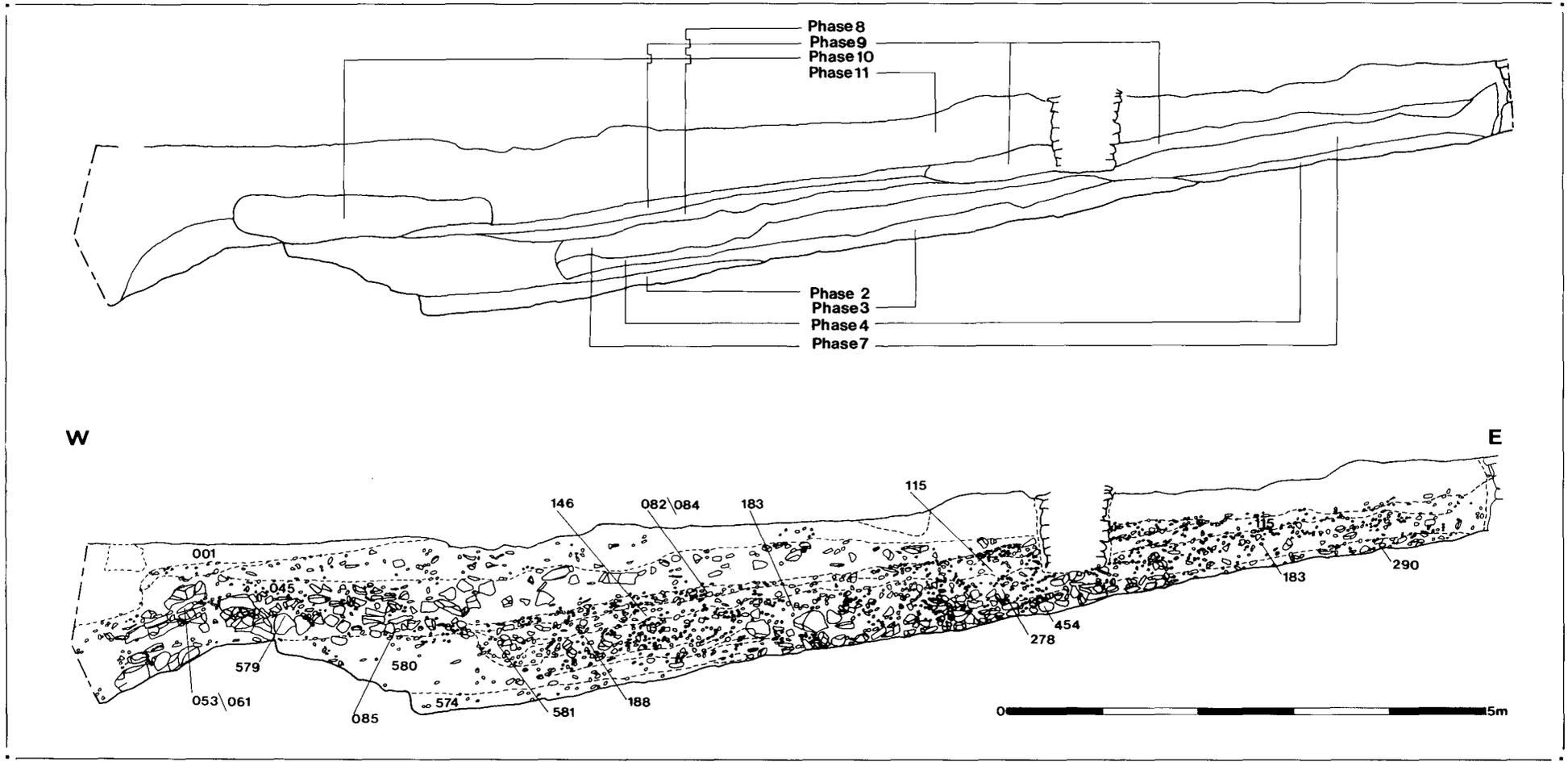


FIG. 24. Site 55: West-facing section.

North via sagularis second resurfacing (FIGS 23, 24)

On Site 55 Road Surface 290–2 was covered by a spread of burnt demolition debris (269, 274, 276, 282), 0.03–0.07 m thick. These deposits were covered by a new surface (262, 263) with a very high concentration of pebbles and small stones contained within a matrix of yellow-grey sand and silt, which partially covered the second resurfacing of the *via principalis* (see below). A similar surface was excavated on Site 69 (138). To the east of the *via principalis* the new interval road was 3 m wide, to the west it extended to a maximum width of 6.6 m. It was 0.02–0.05 m thick.

The surface on Site 55 was cut by a pit (273) of uncertain function, near to the junction with the *via principalis*.

The surface was laid in Phase 4 on Site 69 and Phase 5 on Site 55.

North via sagularis third resurfacing (FIG. 23)

On Site 55, the *intervallum* road was covered by a new interval road surface (273), which at its eastern end was laid directly on the previous surface. The metalling, which was similar to that forming a new road surface on Site 69 (137), was composed of pebbles and small stones in a yellow-brown sand and silt matrix and was up to 4.0 m wide. In the western part of Site 55, 273 merged with similar surface (170), up to 0.10 m thick, but set in a grey sand, silt, and grit matrix. Here the road was up to 6.0 m wide. Unlike 273, 170 was laid on a cobble and clay make-up (242), 0.1 m thick.

The surface was laid in Phase 5 on Site 69 and Phase 6 on Site 55.

North via sagularis fourth resurfacing (FIG. 23)

The fourth interval road surface underlay yellow-grey silt on Site 69 (136), and layers of clay (184) and brown silt (181, 185) on Site 55. Here cobble and boulder make-up deposits (180, 182) served to raise the central part of the road by 0.13 m, thereby forming a camber. The new surface (69\118, 55\123) comprised of densely packed small stones and pebbles with occasional concentrations of cobbles was 0.2–0.4 m thick. On Site 69 it was 3.5 m wide, on Site 55 5–6 m wide.

Whereas with some of the earlier resurfacing activity on Site 55 it could be clearly shown

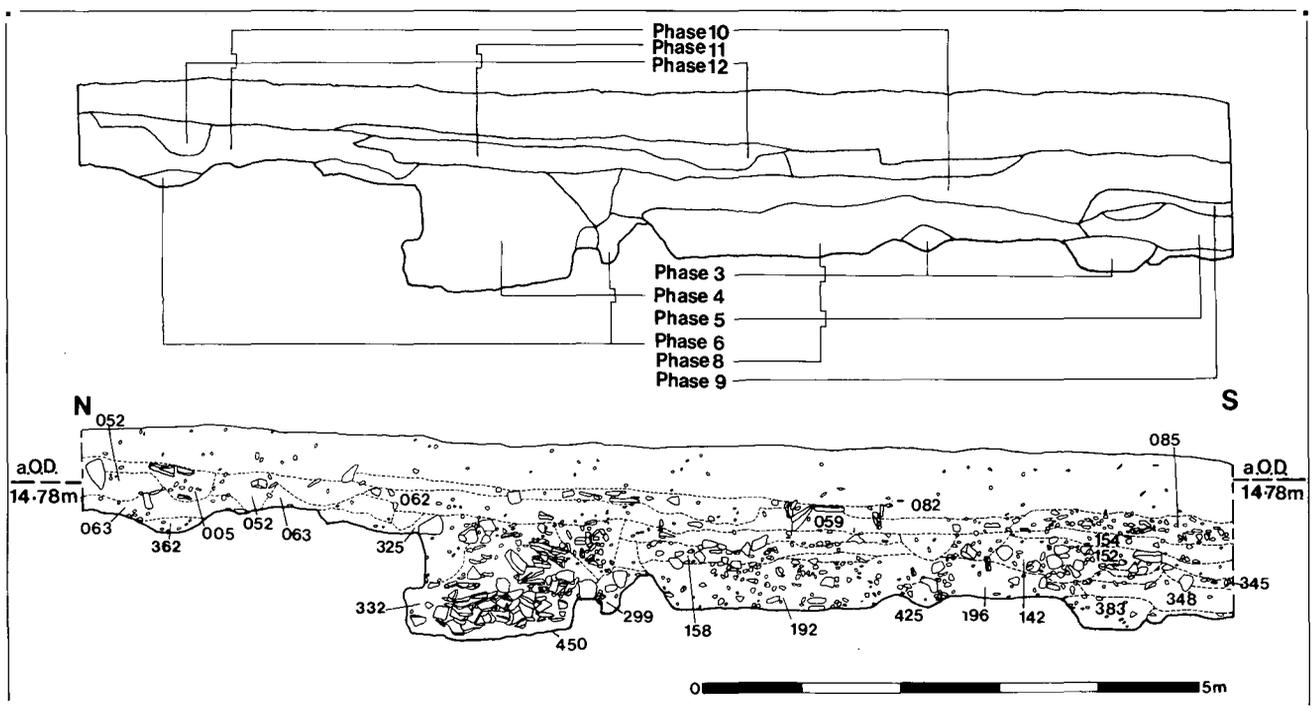


FIG. 25. Site 57: West-facing section.

that either the *via sagularis* or the *via principalis* were resurfaced first, in this instance it appears that both roads were resurfaced as part of a single operation.

This activity occurred in Phase 7 on Site 55 and Phase 6 on Site 69. In both cases it is likely that this resurfacing occurred at about the same time as the reconstitution of the defences in stone. Although this cannot be proved, finds from these contexts are Flavio-Trajanic in date (see Site 55: Dating evidence: Phases 6 and 7 below p. 72).

South via sagularis resurfacing (FIG. 25, 31)

The interval road on Site 57 was reduced to a width of c. 3 m by the construction of Building 2.9. The southern half of the earlier road was resurfaced with a layer (247) of small to medium pebbles compacted together and set over a 'make-up' (367) of cobbles set in a matrix of orange sand and gravel, which covered a group of pits [566] cut in Phase 5 on this site (see below p. 66).

Roads adjoining the *via sagularis*

The via principalis

Primary surface (FIGS 20, 24)

Near the east end of Site 55, the primary *via sagularis* surface merged with a similar deposit (454) aligned north–south and running towards the gate passage (above p. 57). The location of this road within the known orientation of the fort enables it to be identified as the *via principalis*. The northern half of 454 overlay a dump of cobbles (466), up to 0.3 m deep, which graded out into the natural slope of the hill. The cobbles, up to 0.20 m large, were contained within a matrix of yellow-grey silt, sand, and grit, and directly overlay the natural subsoil. Where 466 was not present 454 directly overlay the natural subsoil. Although for the most part the road surface extended beyond the excavated area to the east, near the south limit of excavation it became apparent that the *via principalis* was 3.0–3.2 m wide and aligned north–south. The west side of the *via principalis* was fronted with a kerb (453) in a similar matrix and at right-angles to that fronting the north side of the *intervallum* road here (450–2).

Later Surfaces (FIG. 24)

Most, but not all of the road resurfacings, levelling deposits, and make-ups appear on the section drawings accompanying this chapter.

The primary *via principalis* surface was covered by part of the deposits (290–292) forming the first resurfacing of the *via sagularis*. This in turn was covered by a new surface (278) with a high density of pebbles and small stones in a sand and grit matrix shortly before the second resurfacing of the interval road.

This surface served until the fourth resurfacing of the *via sagularis*, when a new metalled surface (183) was laid over make-up deposits of stones and cobbles (254, 255). These deposits were cut by a gully of uncertain function (245), which was covered by the new *via principalis* surface.

The last surface of the *via principalis* and the underlying make-up layers assigned to the primary fort produced considerable quantities of Flavio-Trajanic pottery (including Samian Stamp No. 3); material from the road surface can also be extended into the Hadrianic period.

The via quintana (FIG. 21)

Primary surface

On Site 69, a metalled surface (401; not illustrated) at least 3 m wide, formed from small stones and pebbles concreted together, was discerned in Area B. It was aligned north–south. Given its position in relation to the known orientation of the fort, this road must be the *via quintana*. The road was constructed at the same time as the adjacent section of the *via sagularis*. Although the

earliest surface exposed, it is possible that this was not the primary surface, as lack of time prevented the full excavation of this site.

Later surfaces (not illustrated, except 287)

Two resurfacings of the *via quintana* were detected. The first (287) was probably contemporary with the second resurfacing of the *via sagularis*. It was comprised of small stones and cobbles compacted into a grey-brown sand silt, and rested above a cobble make-up (290) over dumps of silt and clay (291, 300). This surface in turn underlay a further cobble make-up (280), laid down to support a new surface (267), of similar composition to 287, and perhaps contemporary with the third resurfacing of the *via sagularis*.

Other roads (FIGS 20, 36)

At the West end of the Castle Street site the primary *via sagularis* surface met a north-south road (596), which may have projected as far as the back of the rampart. This road, which continued across the fort, was also detected on Site 53 (Phase 14, 3123) and in a section to the east of Site 57 (217\221). As with the adjacent *via sagularis*, it is probable that this road was resurfaced on several occasions, but evidence for this had been removed by the construction of a rampart associated with the reduction of the fort (see below p. 75) and only the earliest surface of cobbles packed into a yellow sand silt (292) survived.

Drains (FIGS 20, 23, 24, 25, 27)

Unlike those of the *via praetoria* on Site 53 (below, Chapter 3), drains serving the *via sagularis* and adjoining road surfaces are notable by their absence.

Drainage for the north *via sagularis* appears to have been provided primarily by the depression left at the rear of the rampart once the rear face had been completed and the working area against the terrace cut filled in. This left a marked 'V-shaped' depression. On both Sites 55 and 69 there was very little usable space (c. 0.5–1 m on Site 69, 1–2 m on Site 55) left between this feature and the interval road and no other structures or features were discerned here.

On Site 69 the initial depression was over 1 m deep and although this gradually filled [384 (see FIG. 23 for 144, 153, 156)] it was compensated for by raising the level of the adjacent road to leave a gully c. 0.75 m deep by the end of the occupation of the first fort. On Site 55 the depression was shallower, originally 0.75 m, and was eventually reduced, through filling [599] during the occupation of the first fort, to a depth of c. 0.5 m.

There was no evidence that the feature was lined, which would be expected if water was not to percolate through the rampart revetment and weaken that structure. Certain of the deposits contained appreciable quantities of clay and stone which may have served this purpose, otherwise a timber structure, which has left no trace in the archaeological record, may have been employed. It is possible that the looser material filling the void between the rear of the rampart terrace and the rear revetment of the rampart may have acted as a 'french drain'. The slope of the terrace would then have allowed water to drain towards the north gate.

On Site 55 this system was reinforced by a series of gullies cut along the north side of the road. One of these (449\476; not illustrated) accompanied the primary surface. A kerb, represented by a number of stone blocks up to 0.4 m large (450, 451, 452; not illustrated) many arranged in a linear fashion, and part of the road surface had slipped into this feature. Other shallow gullies (296 and 258, 260, 271; not illustrated) were cut alongside the north side of the interval road to accompany the first and second resurfacings respectively. Part of the drain system accompanying the second resurfacing (258) was cut across the road and some attempt was made to provide 271 with a kerb (257). It is not unusual for drains to cut across the line of road surfaces (see for instance Prysge Field, Caerleon: Nash Williams 1932) but it might have been expected that some form of cover would have been provided, but there was no trace either of slabs or evidence of robbing.

No attempt was made to provide a drain on the south side of the north *via sagularis* or on the west side of the *via principalis*.

The primary surface of the south *via sagularis* was provided with a central drain (57\417), 0.35–0.40 m wide and 0.22–0.30 m deep. However, excavation showed clearly that it had cut the road, implying that the drain was not an original feature. Unlike other features cutting this surface, it had a predominantly gravel fill (416), perhaps material fallen in or washed out from the road. No drains were provided to serve the replacement feature on this site.

The west side of the third resurfacing of the *via quintana* was faced with an earth-cut drain (409).

FEATURES AND STRUCTURES FOUND BETWEEN THE *VIA SAGULARIS* AND THE REAR OF THE RAMPARTS

Features and structures to the rear of the north rampart

Apart from the depression to the rear of the north rampart described above (p. 61), no features or structures were found in this area, other than a small hearth (55\247; not illustrated) constructed in Phase 6.

Features and structures to the rear of the south rampart

A complex sequence of activity, described below in order of site phase, was recorded to the rear of the south rampart and above the *intervallum* road on Site 57.

Site 57: Phase 2 (FIG. 22)

Building 2.3

Part of a small structure (525) of uncertain function represented by three joining post-trenches, 0.2–0.4 m wide and 0.17–0.52 m deep, was located in the south corner of the site immediately to the rear of the rampart. The trenches had been truncated by later features. Two, parallel and aligned east–west, were linked by the third feature, which was 1.5 m long. Circular or sub-circular (average size 0.10 m by 0.12 m) post-settings were surrounded by layers [563] of grey-green sand containing gravel and small stones.

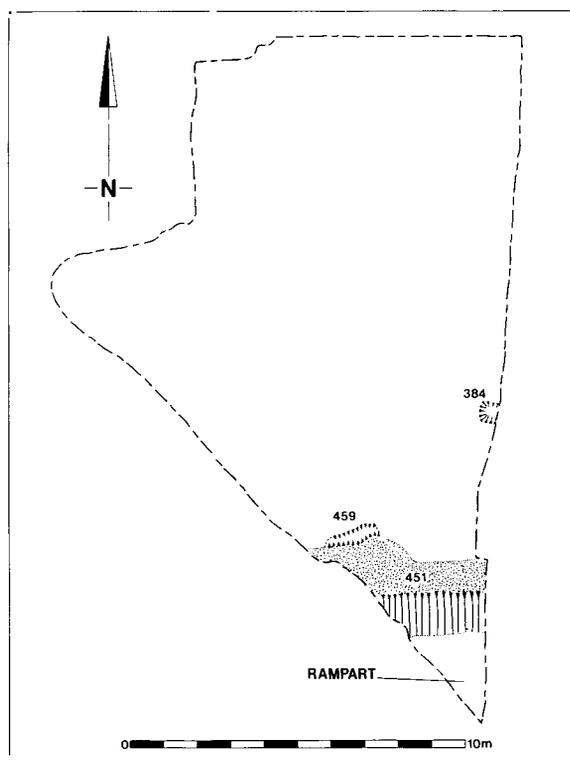


FIG. 26. Site 57: Phase 3.

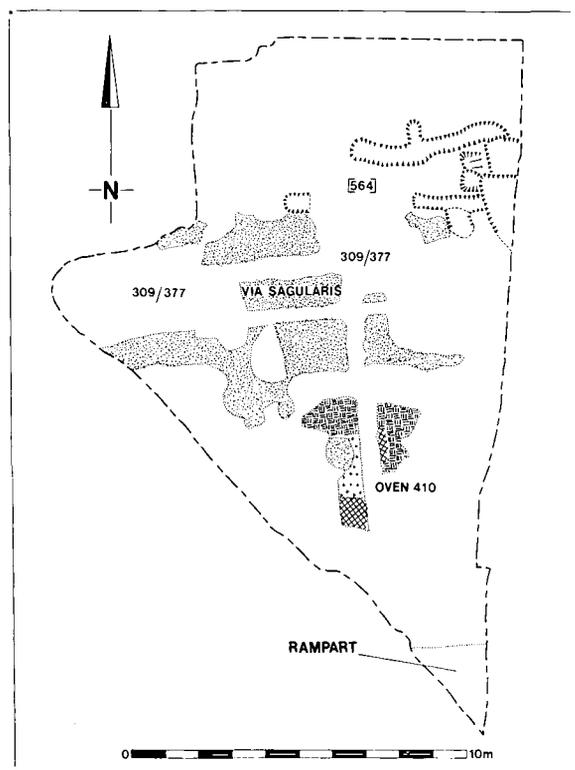


FIG. 27. Site 57: Phase 4.

Site 57: Phase 3 (FIGS 25, 26)

A thick (0.4 m) layer (451) of grey-brown silt containing a large quantity of water-worn cobbles, which may have served as hardstanding to the rear of the rampart, was deposited above the remains of Building 2.3. The north-west edge of the deposit was cut by an extensively truncated gully (459), which may have functioned as a drain. This was filled with dark brown silt (425; FIG. 25) heavily flecked with charcoal and daub. The south half of the cobbled layer underlay dumps of clay, charcoal, and stone (445, 487; not illustrated), which continued up to the rear edge of the rampart. These were probably deposited to fill a depression to the rear of the rampart caused by the compaction or slumping of the earlier fill deposit (491: Phase 2). A solitary pit (384) of unknown function was found near the eastern baulk. This sub-circular (0.6 m diameter) feature, 0.27 m deep, was filled with a layer (383; FIG. 25) of dark brown clay silt sand containing large quantities of cobbles and charcoal.

Although separated here into two phases, mainly on stratigraphic grounds, the activity described above probably occurred over a very short period. It should be noted that much of the evidence for activity is fragmentary and could not easily be related either during or after excavation. This is not necessarily that significant as the contexts identified are probably best interpreted as activity associated with the preparation of this part of the fort for permanent occupation.

Site 57: Phase 4 (FIGS 25, 27, 28, 29)

The depression behind the rear of the rampart was further reduced by the deposition of layers of clay (402, 430; not illustrated).

Oven 410

The remains of a roughly circular and truncated double-chambered oven (*c.* 3.5 m max. across) were formed from a core of compact clay (382, 418, 419, 431), within which two central chambers were set side-by-side with south-facing openings. The oval shaped, 0.7 m by 0.8 m,

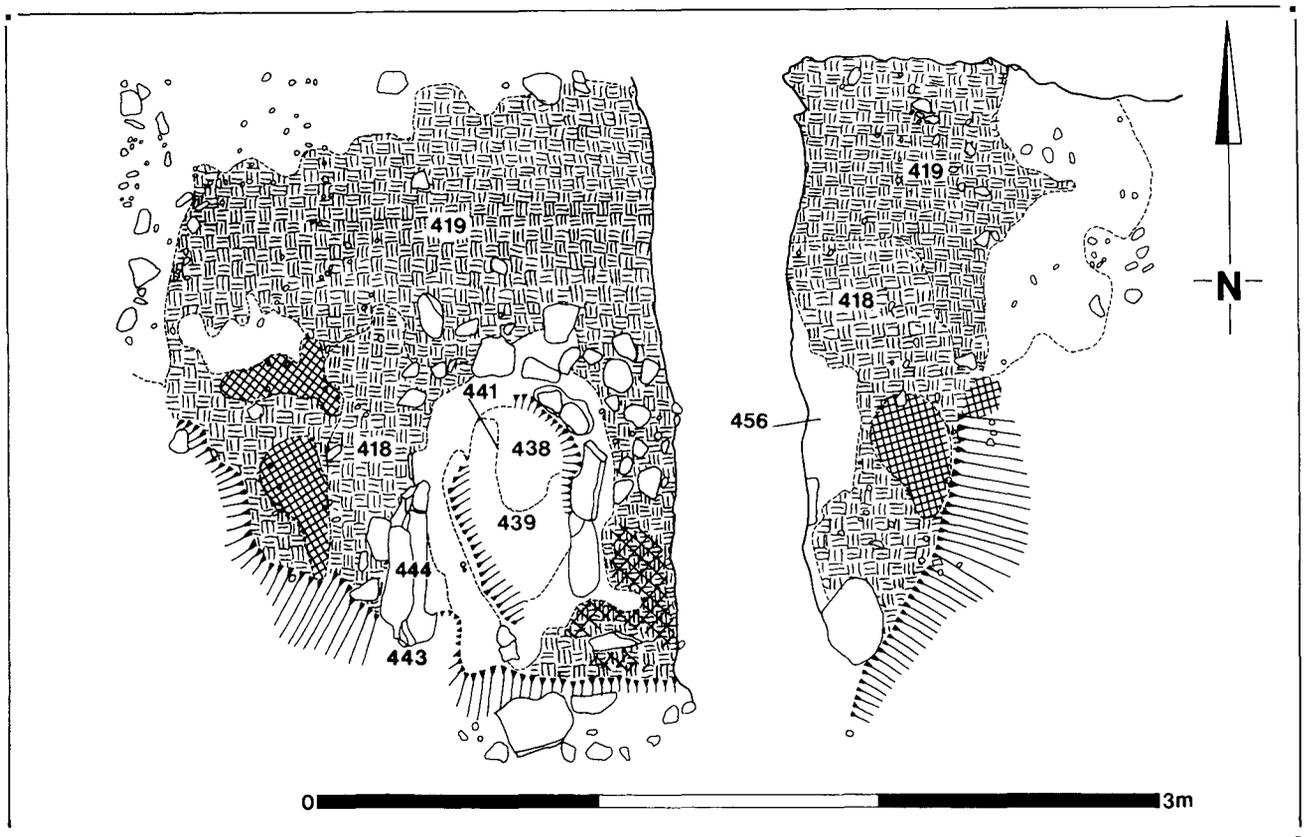


FIG. 28. Site 57: Oven 410.

western chamber (443) was lined with fired clay and sandstone blocks (444). The chamber was subsequently relined with clay (308, 455), with the result that the new chamber (441) was reduced by approximately 30 per cent and measured 0.8 m by 0.4 m by 0.3 m. It was surrounded by walls (433, 438) and a floor (442) of fired clay. The chamber was subsequently refloored (439) to form a final chamber (432) of similar plan but 0.23 m deep. This was filled in with a very mixed layer (428) of burnt clay, daub, and charcoal which had presumably been derived from the roof of the burnt structure. The eastern chamber (456) had been almost completely destroyed by later activity but sufficient survived to suggest that it had been of similar size to the western chamber and had also been relined on several occasions. A considerable (0.25 m) build-up of ash, charcoal, and daub (311, 387, 422, 423) was located to the south of the burnt structures. In form the oval shape of the oven is different from the circular, domed bread-ovens commonly found to the rear of fort ramparts (Johnson 1983b, 200–2). A similar feature was found on Site 53 (Chapter 3, Phase 2). The oven here is presumed to have been used for cooking if not necessarily baking bread; there was no evidence to suggest an industrial function. The need to reline or rebuild the oven chambers perhaps reflects intensive use. The oven was demolished at the end of this phase. Traces of three further possible ovens (543–5) further to the west were observed during the watching-brief carried out in 1989. These may have been contemporary, but this could not be proved.

Site 57: dating evidence: Phases 2–4

The closely datable material (in particular Coins Nos 17 and 31, Samian Stamps Nos 19 and 20, Samian Nos 56 and 57), there was one possible exception (Samian Stamp No. 21) but this need not necessarily be later, suggests the activity on Site 57 in Phases 1–4 occurred between 75 and 85 and this is not contradicted by the coarse pottery. However material from Phase 5 (below p. 67) must date to after *c.* 95. It has already been noted that the activity in Phases 1–3 probably occurred over a short period of time as it is connected with the clearance of the site and the construction of the defences. The *via sagularis* was constructed here in Phase 4, but

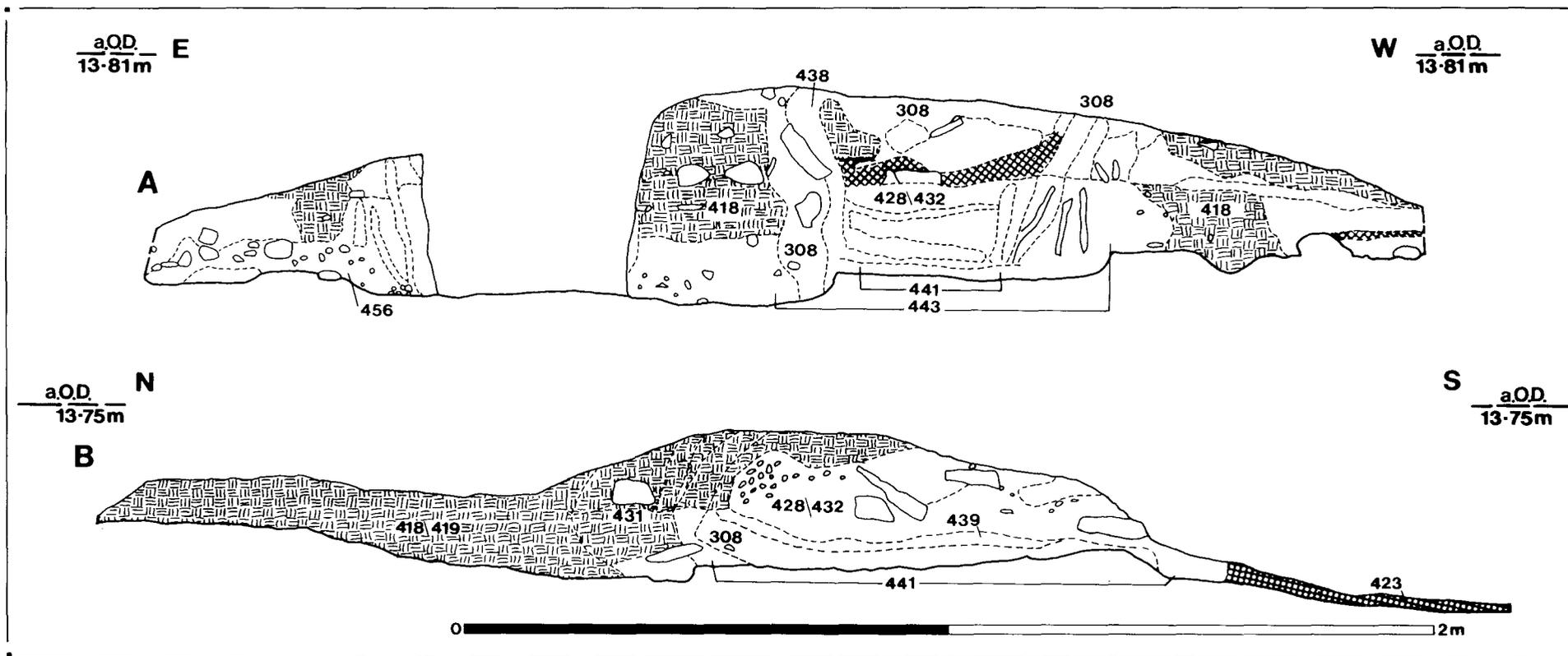


FIG. 29. Site 57: Oven 410 sections.

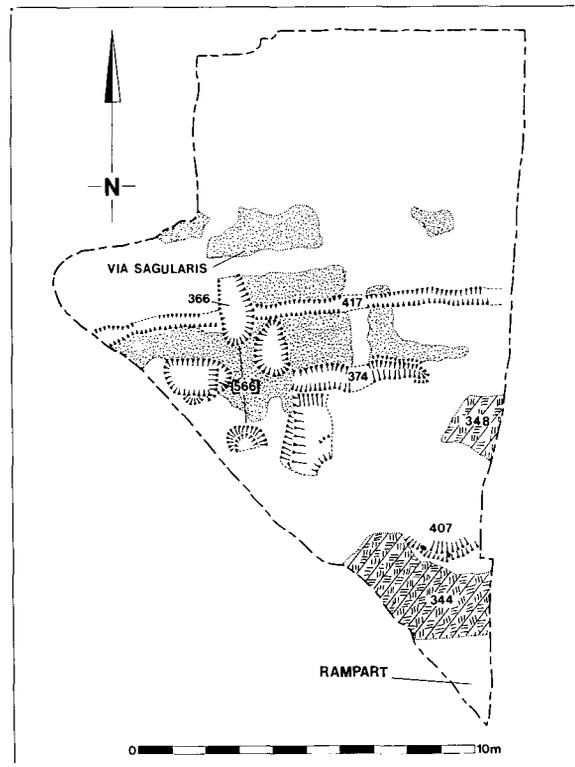


FIG. 30. Site 57: Phase 5.

this must have been a primary feature of the fort. What is therefore suggested is an initial period of intense activity – site clearance followed by the construction of the rampart, *intervallum* road, and ovens – followed by a long period when much of the site remained unused.

Site 57: Phase 5 (FIG. 30)

The *via sagularis* was cut by a slot (374) and five pits [566]. Oven 410 was covered by material dumped to the rear of the rampart, where a further pit, 407, was also encountered.

Slot 374

This slot of uncertain function, aligned east–west and *c.* 4 m long by 0.40 m wide by 0.25 m deep, cut the southern edge of the *via sagularis* and the northern part of the oven (410) demolished at the end of Phase 4. It was filled (373) with a greyish brown sand silt containing small stones, charcoal, and daub.

Pit Group 566

The pits, which cut a dump (424) of daub and stone, 0.10 m thick sealing the south-western part of the *intervallum* road, ranged in area from 1.1 m by 0.6 m (min) to 1.7 m by 1.2 m and in depth from 0.10 m to 0.5 m. They were mainly filled with layers (567) of pale grey clay flecked with charcoal and daub and containing a few stones, with the exception of a single example (366) which contained three fills and cut the central road drain, (417). The uppermost deposit (365) was similar to the fills of the other pits but the lower layers (371, 372) were olive-brown sand silts both containing appreciable quantities of charcoal, whilst the upper deposit also contained some stone. These features may have been cut to extract gravel and sand, and were partly filled with rubbish.

Pit 407

Most of this feature, which had cut the layers (particularly 402, see Phase 4) filling the depression to the rear of the rampart, had been removed by a later pit (see Context 458, Phase 8 below

p. 70). It was filled with a layer (394) of grey-brown silt clay containing a few oyster shells. The purpose of the pit is unknown.

Dumps 344, 345, 348

The debris from the use and the demolition of Oven 410 was also partially covered by a truncated layer of clay and turf (344, 348; FIG. 25 for 348), which extended as far as the tail of the rampart, thereby filling the depression immediately to the rear of that feature. This layer in turn underlay a dump of clay (345; FIG. 25). The presence of the turf layer 348 perhaps indicates some refurbishment to the adjacent rampart in this phase.

Site 57: dating evidence: Phase 5

The material from the Phase 5 deposits includes a coin of Domitian (No. 47) from 366, Flavian samian (Nos 58–60) and some coarse pottery (Nos 177–88) including the first appearance of BB1 (No. 184). A very late Flavian or early Trajanic date is most likely for this activity.

Site 57: Phase 7 (FIG. 31)

A small structure (Building 2.4) was constructed above the resurfaced *via sagularis*. Three dumps of clay (193, 288, 290; not illustrated) were deposited to the south of the *intervallum* road and west of Building 3.

Building 2.4 (PL. X)

The building consisted of three, or possibly four, lengths of post-trench. The longest post-trench was aligned north–south. It was joined from the east at right-angles by the other features, which are presumed to have continued beyond the limit of excavation to the east. The western and northern post-trenches had been cut through the *via sagularis* and the northern example also cut the south wall of an earlier structure (Building 2.9) lying to the north of the *via sagularis* (see below p. 74). The post-trenches ranged in width from 0.50 m to 0.68 m and in depth from 0.38 m to 0.46 m. The circular, 0.11 m av. diameter, post-settings were surrounded by layers

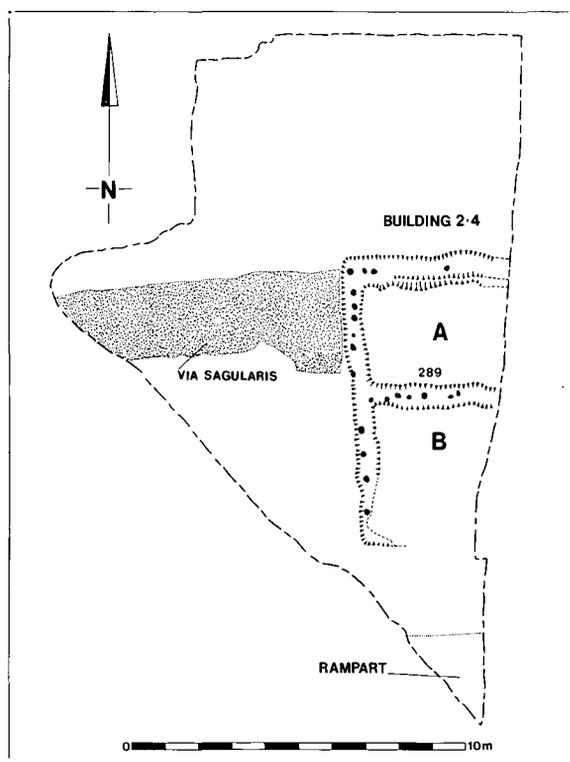


FIG. 31. Site 57: Phase 7.

(245\251, 250) of red-brown clay silt and sand containing appreciable quantities of cobbles and stones. The post-trench (289) representing the position of the internal division of the building contained an upper fill (190) of dark olive-green/brown silt sand containing 40 per cent cobbles, stones and pebbles.

Little can be said about the structure or function of the building. The presence of large quantities of charcoal and daub in a demolition deposit which covered the structure (see Site 57 Phase 8 below p. 70) implies that the walls were of wattle-and-daub. The material used to roof the structure is unknown. No floor surfaces were recorded. It is possible that the underlying *via sagularis* surface was sufficient for this purpose.

The arrangement of the trenches suggested the presence of at least two rooms (A and B). These are reminiscent of the end-rooms in the mens' quarters of some barracks, but the building can hardly be part of such a structure given the proximity of the *via principalis* to the east; even a short barrack would cross this, and thereby block both that road and also the south gate. More probably the structure was used for storage.

Even if the building continued eastwards only as far as the *via principalis*, its siting would still have rendered this section of the *intervallum* road useless. This is unusual as the *via sagularis* was normally kept free of obstruction, and especially because the area immediately to the north was apparently unoccupied in this phase.⁴ Elsewhere, the west section of the *intervallum* road was also blocked (see Site 53 Phase 5; Chapter 3). It may be surmised that western and south-western sections of the *via sagularis*, which were on the sides of the fort looking out over the marshes, were less important than the other parts of the road.

Site 57: dating evidence: Phase 7

The small quantities of material (including Coin No. 32, Samian Stamp No. 40; Samian Nos 63 and 64, Coarse Pottery 191–5) recovered from this phase are Flavio-Trajanic with the exception of an Antonine samian fragment from 288, which, given the location of the building next to the eastern limit of excavation, can possibly be discounted as an accidental intrusion during excavation. It is certainly out of place with the other material, for which a date in the last decade of the first or first decade of the second century would be acceptable.



PLATE X. Site 57: Latrine structure (centre left) and the partly excavated foundation trenches of Building 2.4; the later well is in the background looking south (2 m scales).

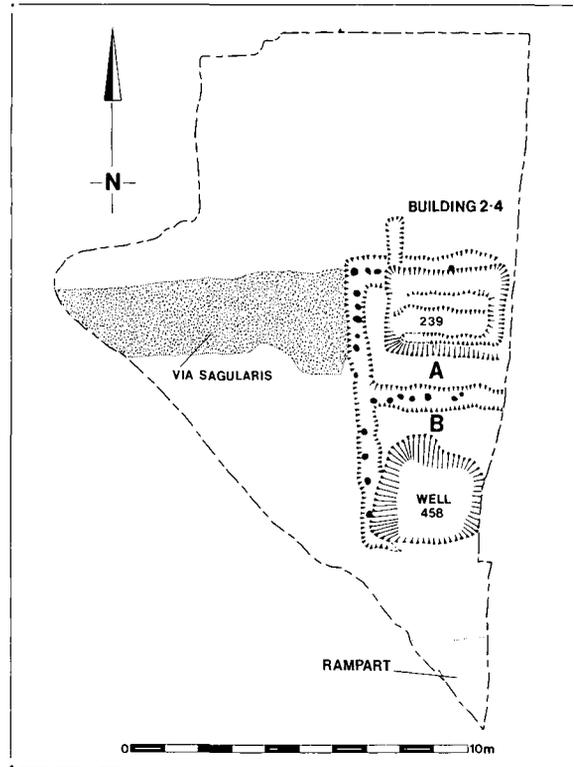


FIG. 32. Site 57: Phase 8.

Site 57: Phase 8 (FIGS 25, 32; PL. X)

This phase was represented principally by the conversion of Building 2.4 into a latrine. A well (458) and some features of minor significance may also be assigned here.

Latrine structure (PL. X)

The interior of the north room (A) of Building 2.4 was modified by the insertion of a series of interconnected slots [239]. The southern part of this system consisted of a wide (*c.* 1.5 m) area, 0.38 m deep, through the base of which was cut a narrower (0.2 m wide) slot, 0.13 m deep. This slot ran eastwards for *c.* 2.5 m before it widened (*c.* 0.5 m) and turned northwards for *c.* 1.5 m before widening again (*c.* 0.65 m) and turning westwards, in which direction it ran for *c.* 3.5 m. At the end of this last section the slot was at the same depth as the wide area first described. This last section of slot cut the southern half of the northernmost post-trench as did a further length of slot, 0.4 m wide and 0.3 m deep, which joined it from the north. The slots were filled with a group (568 – see FIG. 25 for 192) of layers of brown or grey-brown clay or sandy clay containing appreciable quantities of stone, daub, and charcoal.

The identification of the building as a latrine is reasonably certain as the arrangement of slots is paralleled in similar stone and timber structures (Johnson 1993b, 211–14; Miket 1983, 23–4). In the example here the slots are presumed to have been covered by a timber floor. The seats for the toilets were presumably sited above the wider area where the drain was at its deepest. The additional slot extending from the north of the building may have been cut to provide a channel for water to flush the system. The toilet would undoubtedly have been a noxious place even with regular cleaning. It is perhaps surprising that no evidence for cess or staining of the sides had survived; this may cast a degree of doubt on the interpretation of this feature as a latrine but the structural arrangements would argue that this is the most likely function and the absence of staining perhaps indicates that the cess was not allowed to accumulate or that the toilet was lined in timber or some other removable material. The relationship of the latrine to the preceding building is not entirely clear. It was certainly a secondary development as it cut

through the north post-trench of Building 2.4, thereby showing that at least the main wall posts were in position before the latrine slots were excavated. From this it might be argued that the construction of the complex was simply a sequential two-stage operation with the structural elements constructed immediately prior to features forming the latrine; but, if the latrine had been added at a later stage, it would not necessarily have entailed any major rebuilding as the slot entering the north side of the building could have been inserted easily after one of the wall panels had been removed.

The foundation trenches of Building 2.4 and the area to the north, west, and south underlay a widespread deposit (196; FIG. 25), 0.02–0.10 m thick, of brown sandy clay containing a large quantity of daub. Although most of the latrine was not covered by the demolition debris, it did appear to overlie the slots which cut the north wall of Building 2.4. This was perhaps because the walls or wall panels had been pushed outwards when the building was demolished, a suggestion perhaps supported by the presence of a large patch of collapsed walling (248; not illustrated) measuring *c.* 1.7 m by 0.7 m, immediately to the west of Building 2.4.

Well 458

A large circular feature (458), approximately 3 m in diameter, had been cut in the south-eastern corner of the site. Into this feature later deposits (see below *passim*) had slumped to a depth of more than 1 m. The feature was excavated to a depth of 2.9 m, but at this point considerations of safety prevented further exploration. At this depth, a central area *c.* 1.8 m square contained layers of grey clay (415) and dark brown sandy silt (413), both heavily flecked with charcoal. These deposits were surrounded by a layer of orange-brown gravel (521). The remainder of the feature was filled up to *c.* 1 m below the top of the cut with deposits of gravel or clay [570].

Given the size and depth of the feature, the most likely interpretation is that it functioned as a well. As it was not fully excavated it is difficult to be certain about its method of construction, but it seems likely that initially a circular shaft was dug in which a square timber-constructed box well, whose shaft was perhaps represented by 413 and 415, was set. The remainder of the shaft was infilled with redeposited gravel (521). Once the feature had gone out of use it appears to have been deliberately infilled. Subsequent compaction or (?) collapse of the lower fills led to the deliberate filling [570] of the upper part of the well pit. Further compaction/subsidence resulted in later deposits slumping into the upper part of the feature. Because of this disturbance, it is difficult to be sure exactly when the feature was cut: it was certainly later than the Phase 5 contexts and earlier than those of Phase 10. Logically it should be later than Building 2.4, which it appeared to cut, but it is possible, although unlikely, that the south wall of this structure had collapsed into the well and was not detected during excavation.

The provision of fresh water was obviously an essential consideration in the planning of any auxiliary fort and consequently wells are commonly found, often as here in the *intervallum*, but also in the courtyard of the *principia* (Johnson 1993b, 202) or the *praetorium*, as for example at Birrens (Robertson 1975). Wells were either rock-cut, stone-walled, or, as is probably the case here, timber-lined (Johnson 1993b, 202). Where they were timber-lined, the linings were either square or rectangular, ranging in width from 0.8 m to 2.2 m, and often consisting of interlocking planks jointed to form caissons, sometimes built around a square framework (Johnson 1993b, 203–4).

Slots 211, 241

The burnt deposit, 196, was (?) cut by two shallow, 0.05–0.10 m, depressions (211, 241; not illustrated) of uncertain purpose. One of these lay to the west and one to the south of the latrine. Both features, each 3 m long, were aligned east–west and curved slightly to the north. The feature to the west, 211, was 0.30 m wide, the other 0.60 m wide. 211 was filled (191) with olive-green-brown silt sand containing appreciable quantities of stone; the other slot contained a layer (240) of grey clay containing some stone, charcoal and daub.

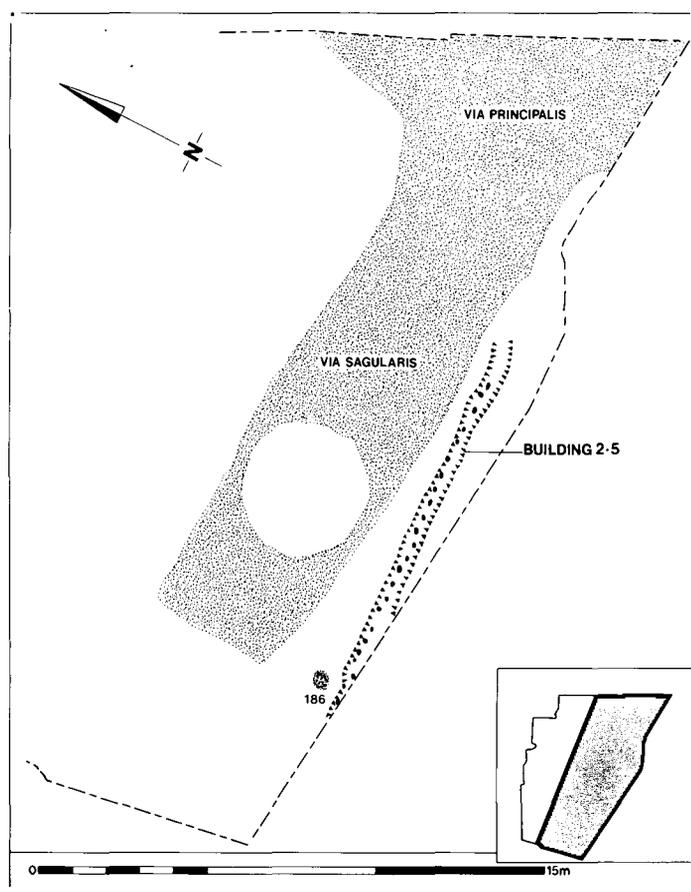


FIG. 33. Site 55: Phases 6 and 7.

Site 57: dating evidence: Phase 8

The greater part of the material from this phase is residual (including two coins, Nos 6 & 27, and most of the samian). One decorated piece (No. 65) must date to the first quarter of the second century, and the coarse pottery (Nos 196–221) is with one exception pre-Hadrianic. As a whole the date of the material cannot be extended much beyond *c.* 115/120.

OTHER FEATURES AND STRUCTURES

Features and structures to the south of the north *via sagularis*

Evidence of activity to the south of the north *via sagularis* was found on Sites 55 and 69. For ease of reference this is described by site and phase.

Site 55: Phase 6 (Not illustrated)

A small sub-circular, 0.6 m by 0.4 m, clay hearth (186), constructed above dumps of clay and sand (190, 204) was located at the west end of the site. The upper part of the feature was slightly concave and filled with a grey-brown silty clay up to 0.5 m in depth.

Site 55: Phase 7

Building 2.5 (FIG. 33)

Building 2.5 was represented by a post-trench (249) set *c.* 1.3 m back from the south edge of the north *via sagularis*, which cut the dumps described above. The sides were steeply angled so that the width of the feature narrowed from 0.60 m at the surface to 0.32 m across its mainly flat base; it was 0.45 m deep. Twenty six roughly circular, 0.08–0.18 m in diameter, post-settings

were identified, where the voids were defined by material (192) packed back into the trench. Part of this deposit was overlain by two layers of clay (188, 189). 188 overlies the hearth 186 demolished in Phase 6. The post-trench and adjoining deposits underlay layers of burnt daub (129–131), derived from the superstructure founded on 249.

It is assumed that 249 and the associated deposits must form part of a building, most of which lay to the south of the site. However, the isolated character of this feature – cut away to the east, continuing beyond the excavation area to the west, and with no evidence for adjoining post-trenches – does not assist interpretation. Although the space between the south edge of 249 and the limit of excavation was limited, the absence of construction-trenches linking with the one recorded may be significant, as might be the lack of any return of the feature southwards along the edge of the *via principalis*. Any such foundation should have been of sufficient depth to have survived subsequent truncation, at least in part. Two interpretations are put forward as they take account of these factors and seem more likely than others: a fence with wattled panels running alongside the *via sagularis*, or the exterior wall of a building defining a corridor with an end-opening or doorway onto the *via principalis* may be suggested. The latter hypothesis might imply that Surface 189 represented an internal floor, with 188 acting as some form of filler between the building and the road; this seems the more likely.

Site 55: dating evidence: Phases 6 and 7

Building 2.5 was constructed after the fourth resurfacing of the *intervallum* road on Site 55. Finds from the contexts in these phases are mainly residual (cf. Samian Stamps Nos 3–5, Samian Nos 7 and 8). A Trajanic date for the coarse pottery is preferred (see P. V. Webster, below p. 342). This activity need not have extended much beyond c. 115/120.

Site 69: Phase 3 (FIG. 21)

Building 2.6

A possible building (417) was located immediately to the north of the *via sagularis*. It was represented by a single shallow slot (135), 0.35–0.4 m wide by 0.18 m deep, which contained a single fill (406) of grey-brown sandy clay. Possible impressions of post-settings were noted in the base of the feature. It could be argued that the feature represented the position of either a roadside fence or drain, and whilst these suggestions cannot be ruled out, it may be noted that this part of the site was more certainly occupied by buildings in subsequent phases. However, given the limited area examined, the function of any structure identified here is open to doubt. No certain return or continuation of this building was encountered in Area B, it must be assumed that it turned approximately at the interface between the two areas, perhaps an indication that it was entered off the side road rather than from the *via sagularis*.

This structure was constructed after the first resurfacing of the *via sagularis* on Site 69.

Building 2.7

To the east of the *via quintana* traces of a second building can tentatively be assigned to this phase. This building (410) was represented by a short length of trench which was encountered only in section. It was cut away at both ends and its exact dimensions could not be fully established. A clay/metalled floor (296/297) lay to the east of this trench.

This structure was contemporary with the earliest identified *via quintana* surface.

Site 69: Phase 4

Building 2.7

The earlier floor (296/297) was replaced with a clay surface (285; not illustrated) overlying intervening layers of silt and cobbles (284, 295, 299; not illustrated).

This activity was contemporary with the first recorded resurfacing of the *via quintana*.

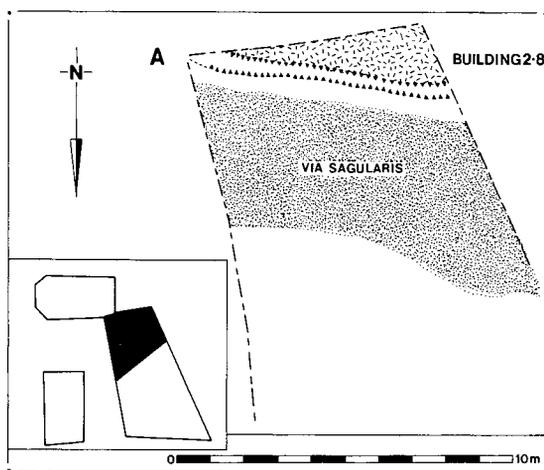


FIG. 34. Site 69: Building 2.8.

Site 69: dating evidence: Phases 3 and 4

Quantities of material were generally small and it is difficult to give a more precise dating other than to the last quarter of the first century for this activity.

Site 69: Phase 6 (FIG. 34)

Building 2.8

The putative Building 2.6 was replaced by a more definite structure (Building 2.8 – 134) represented by a slot, which measured 0.16 m wide but varied in depth between 0.28 and 0.43 m, filled with cobbles (149) under clay (128). Traces of a possible daub wall (115) were found above these deposits. The remains of a clay/metalled floor were located immediately to the south of the slot.

Site 69: dating evidence: Phase 6

Quantities of material were again generally small and precise dating is not possible. This activity was contemporary with the fourth resurfacing of the north *via sagularis* and should be contemporary with the building of the fort wall, but these two areas could not be stratigraphically linked across the rampart.

Abandonment/levelling deposits (FIG. 23)

On Site 69 in Area A a series [379] of mixed deposits, up to 0.5 m thick and composed mainly of organic, charcoal-laced loam but with lesser amounts of slag, clay, and daub, covered the whole of the area behind the rampart except where cut away by later features. In Area B this group of layers incorporated a quantity of large river cobbles. As these deposits ran up to the tail of the rampart and also covered the adjacent roads and structures, they provided a clear separation between the activity in the primary and reduced forts, and probably equate to the levelling deposits below the reduced west rampart on Site 57 (below, p. 75). On Site 69 this activity occurred in Phase 7; material from this phase cannot be later than Trajanic (see P. V. Webster below p. 347) and provides a secure *terminus ante quem* for the abandonment of the primary fort.

Features and structures to the north of the south *via sagularis*

Evidence of activity to the north of the south *via sagularis* was found in three phases on Site 57 (see above p. 64 for the dating of Phases 2 and 4).

Five roughly oval-shaped pits [395], cut in Phase 2 (FIG. 22) and filled with clay [562], were

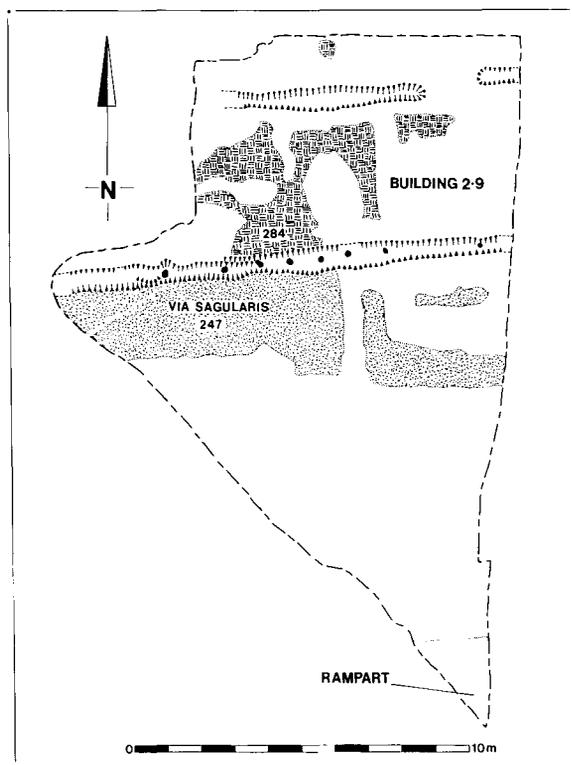


FIG. 35. Site 57: Phase 6.

replaced in Phase 4 (FIG. 27) by a second group of features [564] comprising two slots and several sub-rectangular-shaped pits. The two slots were 0.4–0.5 m wide and 0.15–0.3 m deep, the longer example cut several members of the earlier pit group. The pits were of a similar depth to the slots, with the exception of 333 which was over 1 m deep. The features were filled with clay, stone, and burnt debris [565 (FIG. 25 for 325, 332, 450)]. The purpose of these features is unknown.

Site 57: Phase 6

Building 2.9 (FIG. 35)

A post-trench was located in the central part of the site where it cut the *via sagularis* surface laid down in Phase 4. This feature, 0.48–0.68 m wide and 0.3–0.4 m deep, was aligned east–west and extended across the full width of the site. Eight post-settings (av. diameter 0.15 m) were defined in the trench by a layer of orange-red silt sand and gravel (299; FIG. 25). The post-trench may have formed part of a building as two parallel lengths of trench of similar dimensions and fill (357, 362; FIG. 25 for 362) were located 4 m to the north. No post-settings were observed in either of these trenches. The possible building contained a floor (284) of pale grey clay.

There is some doubt as to whether the remains interpreted as forming Building 2.9 are in fact part of a structure, as the post-trench is the only certain possible structural feature. However, the presence of a possible clay floor and the fact that the two slots were of similar dimensions and had been infilled with the same material as the post-trench perhaps lends weight to the suggestion that these contexts all form part of a single structure. If it is accepted that these contexts do represent the location of a building, then it almost certainly would have had its longer axis east–west, and would therefore have stood on one of the fort terraces. It is possible that the slots represent the position of a central partition, as a small area of clay, perhaps a floor surface, was found to the north of them. The gap between them may have been left to form an entrance. No evidence survived to indicate the type of materials used in or the form of its superstructure. The function of the building is unknown but storage is the most likely possibility.

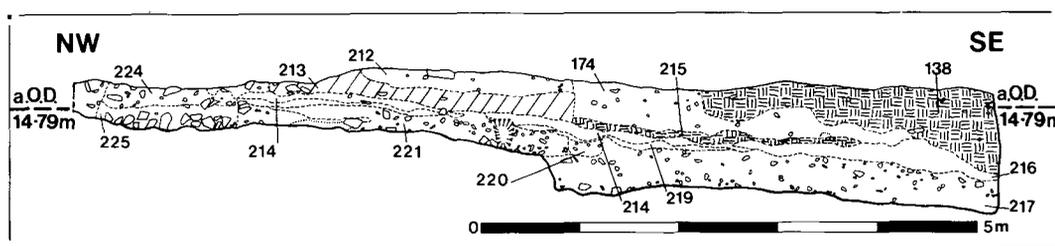


FIG. 36. Site 57: Fort II west rampart south-facing section.

Site 57: dating evidence: Phase 6

Quantities of material were too small to establish any firm dating for this activity, which should have occurred in the late first\early second centuries.

THE REDUCTION OF THE FORT AND SUBSEQUENT MODIFICATIONS

Introduction

Evidence for a reduction in the size of the primary establishment at Loughor was recovered principally from Sites 55 and 57, where a rampart crossing the fort from north to south was recorded in the western parts of both sites; this feature was also examined in a section cut along the railway embankment adjoining Site 57 and during the salvage work carried out in 1989. The provision of the new western defences effectively reduced the internal area of the fort by one-third.

A ditch to the south of this rampart was excavated in the 4 Dock Street part of Site 53 and also identified in section during the later salvage work. Sites 55 and 69 provided evidence for modification of the earlier fort defences; this activity was stratigraphically linked with the reduction of the fort.

Within the new establishment, evidence for the associated road system was found on Sites 55, 57, and 69 and adjacent buildings and structures on Sites 57 and 69. Evidence was also recovered, particularly from these last two sites, for two distinct periods of occupation of the reduced fort, neither of which can be dated with any great precision. The first most probably occurred within the period *c.* 150–200, the second in the period 260–310+.

The recorded information relating to the reduced fort is described under the general headings: Ramparts, Ditches, Road System, Buildings and Other Structures; where appropriate this has been further separated into Fort IIa for the late second-century activity and Fort IIb for that occurring in the late third\early fourth centuries.

Fort IIa: ramparts (FIGS 11, 23, 36, 37, 38, 39)

Construction of west rampart

Although part of the west rampart was observed on both Sites 55 and 57 (Contexts [138] and 230 respectively), its full dimensions were only determined by a section (FIG. 36) cut along the railway embankment to the west of Site 57.

Levelling deposits

Considerable effort had been taken to ensure that the rampart rested on an even platform. At its southern end, a series of dumps of clay, daub, and stone [57\571 (FIG. 36 for 215, 216)] were deposited above the demolished remains of the first fort.⁵ At the north end the *via sagularis* was cut back (55\592) so that all but the very earliest deposits recorded had been either truncated or completely removed. The edge where the road surface was cut away was near-vertical and 0.2–0.3 m deep. Although relatively flat-bottomed on an east–west axis, the feature was only

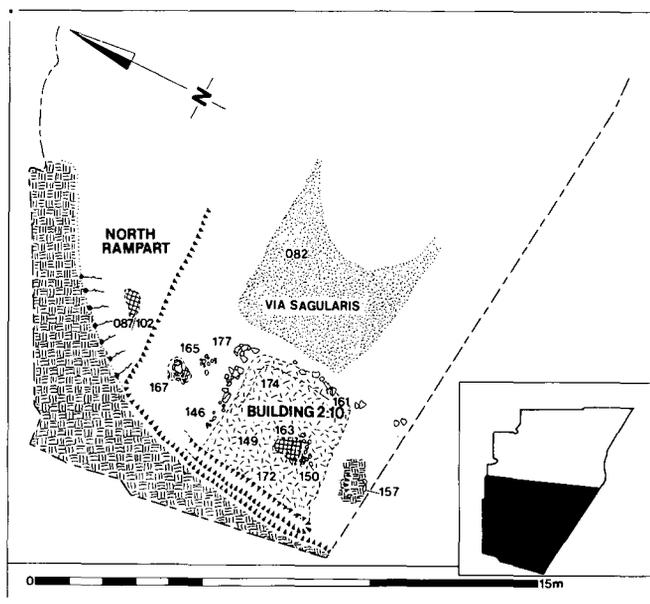


FIG. 37. Site 55: Fort II rampart and Building 2.10.

partly cut into the north–south slope and became shallower and eventually non-existent as the underlying deposits sloped down northwards towards the north rampart of the primary fort. It was not possible to establish the plan dimensions of 592 since it extended beyond the excavated area to the south and west; however its minimum width on the basis of the recorded evidence must have been 5.7 m. This area was then levelled with a deposit, up to 0.3 m thick, of grey-green clay incorporating some sand, turf, burning, and isolated cobbles (171).⁶

The rampart core and revetments

The core of the rampart was only recorded in the section adjoining Site 57 (FIG. 36): here it was formed from sandy clay mixed with burnt daub (174). This was faced with an inner revetment of grey clay (138), 0.8–1.2 m thick, and an external one of turf (213), which may have been subsequently slighted. On Site 55 a similar grey clay internal revetment (040\073), up to 1.4 m thick, was located. The face of the inner revetment was near vertical. Apart from the levelling material there was no evidence for any foundation, and there was certainly no timber corduroy; although such features are generally rare in the post-Trajanic period.

It is possible that the inner clay revetment was retained in place by timber shoring. Evidence for this came from Site 57, where a group [201] of three post-pads was recorded immediately behind the clay revetment (FIG. 42). Each post-pad was set in a small depression, *c.* 1 m by *c.* 1.5 m in plan and 0.1–0.2 m deep, surrounded by a dump of clay (206). The post-pads were represented by a layer of cobble and stones filling each of the depressions. The impression of a round-sectioned post was noted in one of these contexts. Similar features were not recorded at the north end of the rampart but the rear wall of a building constructed in the lee of the rampart (Building 2.10 see below p. 84) might have assisted in supporting the inner revetment here.

Although this rampart had only a single turf revetment, this is not unusual, particularly in Wales (Jones 1975, 80).

Dimensions of west rampart

The exact width of the rampart is difficult to determine accurately as, where fully exposed, the section cut across the feature at an oblique angle, but it was probably between 6 m and 8 m wide. The maximum height of 1.4 m, recorded on Site 55, is probably near to the true original

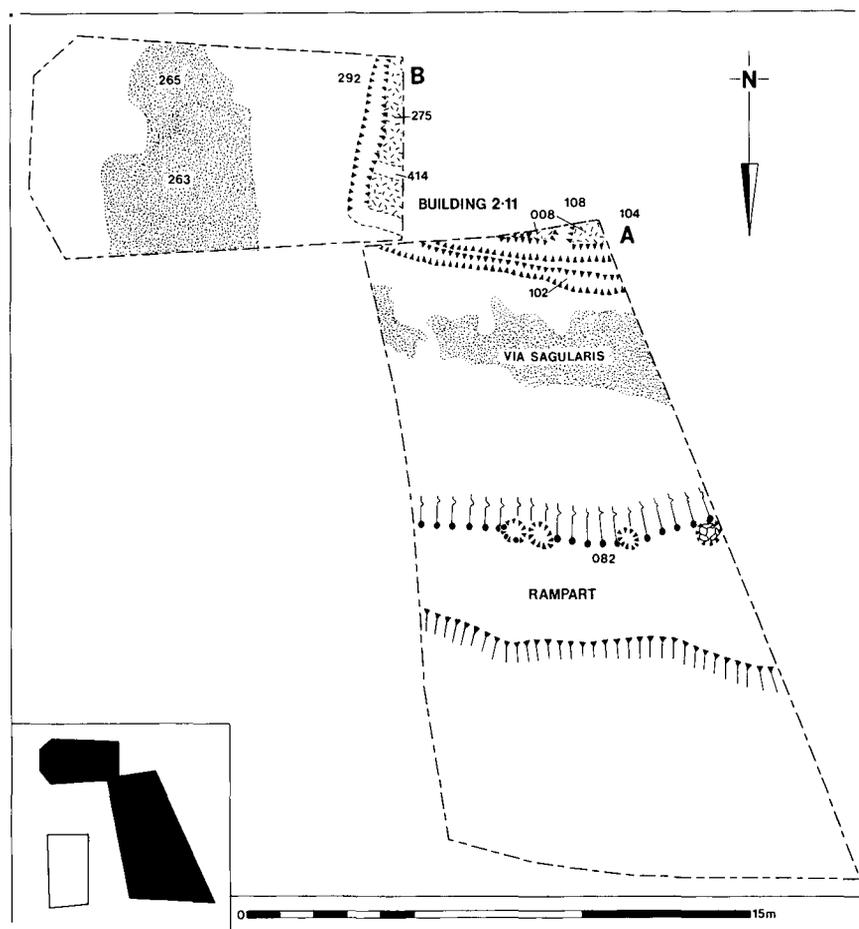


FIG. 38. Site 69: Area A palisade and Fort II *via sagularis*.

height as there was no evidence for slighting of the rampart prior to the addition of a capping wall (see Fort IIb: ramparts below p. 80).

West rampart construction date

Excavation of the rampart and the underlying levelling dumps produced no material that need be later than *c.* 130, the majority being residual and Flavio-Trajanic, apart from a single sherd of coarse pottery (No. 238) recovered from one of the levelling layers at the south end of the rampart. Only a small area of this particular context underlay the inner clay revetment of the rampart here, and this sherd may therefore be intrusive.

On this evidence it would be logical to presume that the fort was reduced in the period *c.* 115\120–130. The evidence from the interior, however, suggests that occupation occurred much later, and construction of the west rampart in the later second century would be more appropriate. The distinct possibility remains, however, that work on reconstructing the fort commenced *c.* 115\120–130 but only the defences were completed before the fort was abandoned and the interior only rebuilt in the late second century.

Modifications to other ramparts

On Site 69 the fort wall had been robbed, or at least reduced in height prior to the establishment of Fort IIa, but the rampart had remained as a distinct mound. The front of this mound was partly cut away (306; FIG. 11) before being reinforced by the addition of a series of distinct layers [381] the lowest of which consisted mainly of a series of randomly laid flat slabs. In Area A a line [082; FIG. 38] of three or perhaps four sub-circular post-holes was cut into the rampart just behind the crest. The three certain examples varied between 0.37 m and 0.39 m in depth

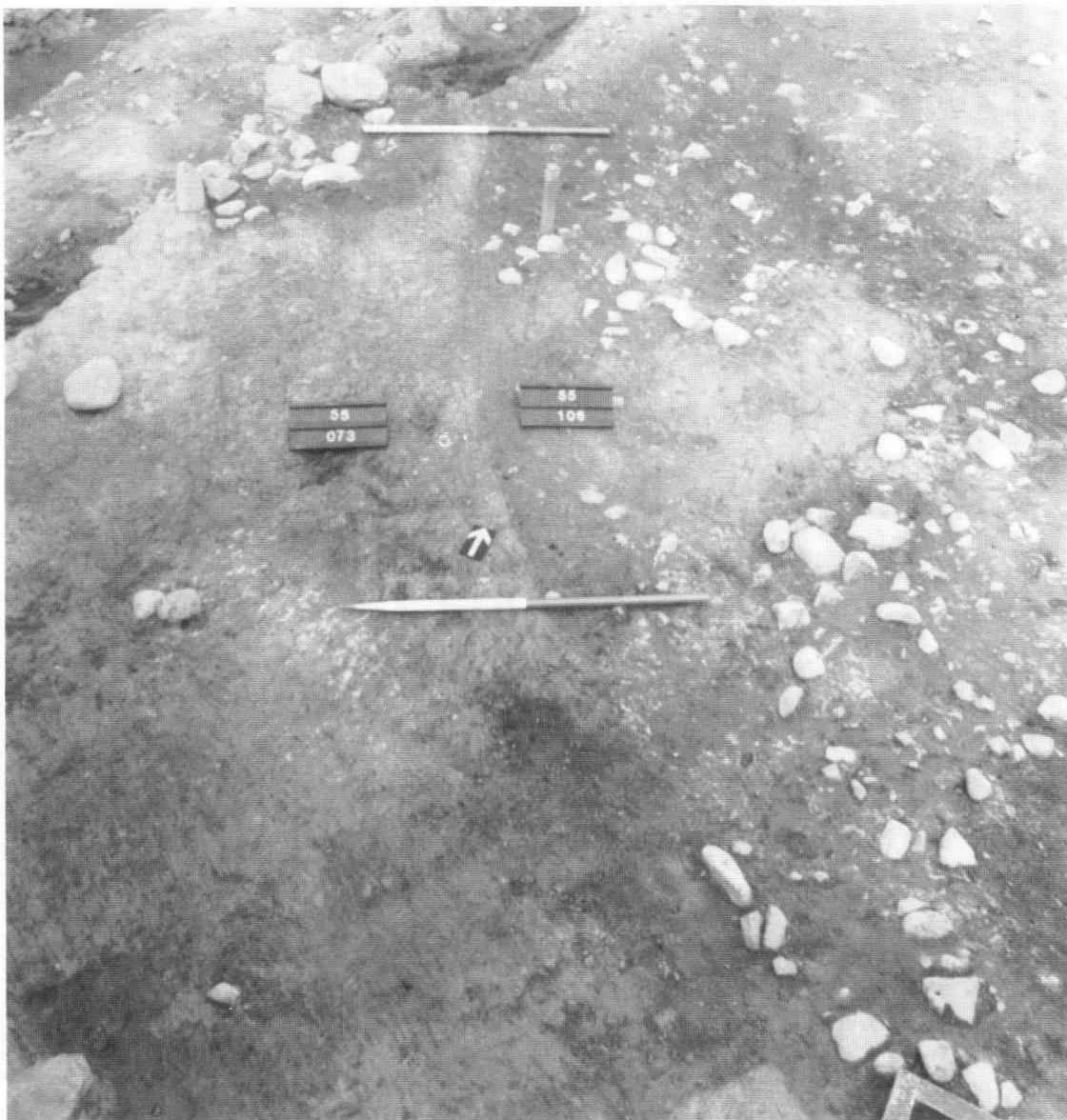


PLATE XI. Site 55: The north-west corner of the reduced fort before excavation (1 m scales).

with a diameter varying from 0.96 m by 0.74 m to 0.88 m by 0.64 m; two of these features had packing-stones along their edge. The fourth feature, although of a similar diameter, was 0.44 m deep and offset from the main alignment; three small stake-holes were cut into its rim. The continuation of this alignment into Area C is uncertain as any similar features would probably have lain just outside the area excavated, although a shallow rectangular feature (351; FIG. 11) located on the extreme eastern edge of Area C may be associated with this activity. These structures perhaps represent the location of a simple palisaded breastwork along the riverside defences, where a more substantial defence may have been considered unnecessary. However, as there was no trace of a similar arrangement on Site 55, this interpretation must be treated with caution. On Site 55 (PL. XI) the existing north rampart was tied into the new bank which, at its northern end, was gradually curved through 90 degrees over a distance of approximately 10.5 m. At the point where the two ramparts met the rear clay face of the new west rampart was tapered over the turf capping and rear turf revetment of the earlier north rampart.

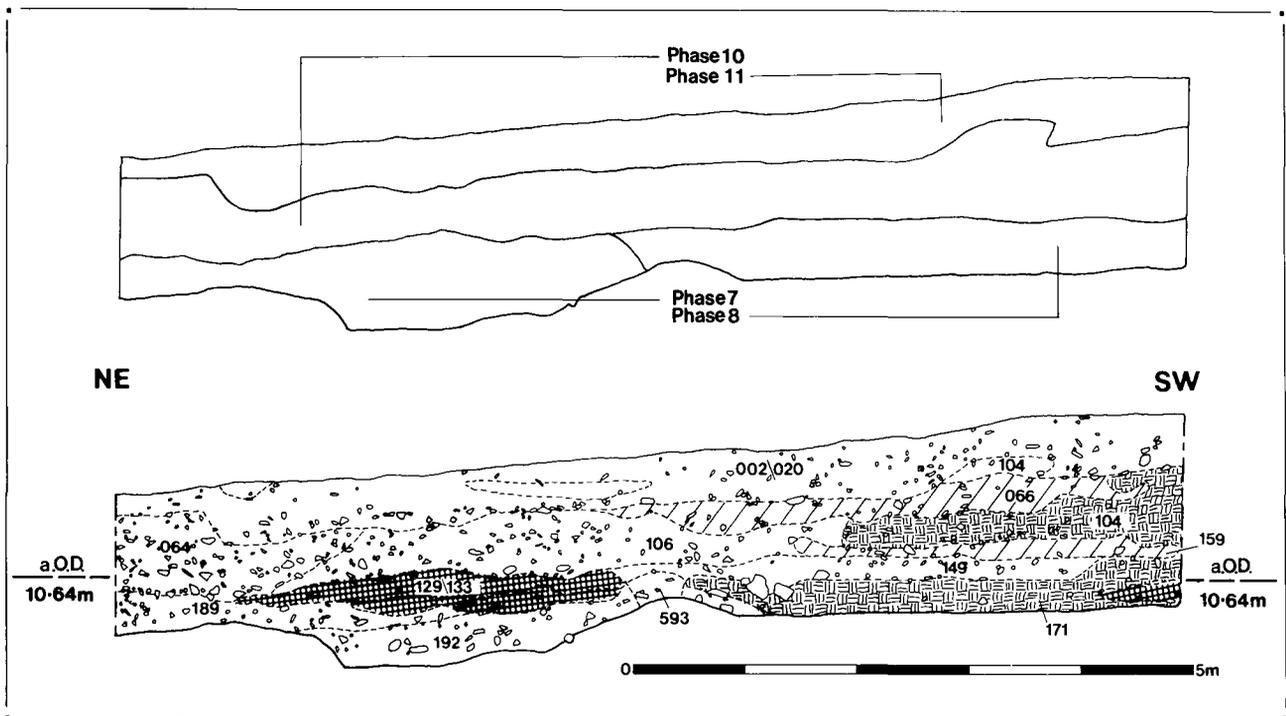


FIG. 39. Site 55: North-facing section.

Drain 69\120

The earth-cut 'french' drain to the rear of the rampart on Site 69 was recut through the abandonment/levelling deposit 056. The new feature (120; FIG. 23), was 2.1 m wide at the top but narrowed to a basal width of 0.25 m, it was 0.6 m deep. The equivalent feature on Site 55, now partially filled, continued in use unaltered.

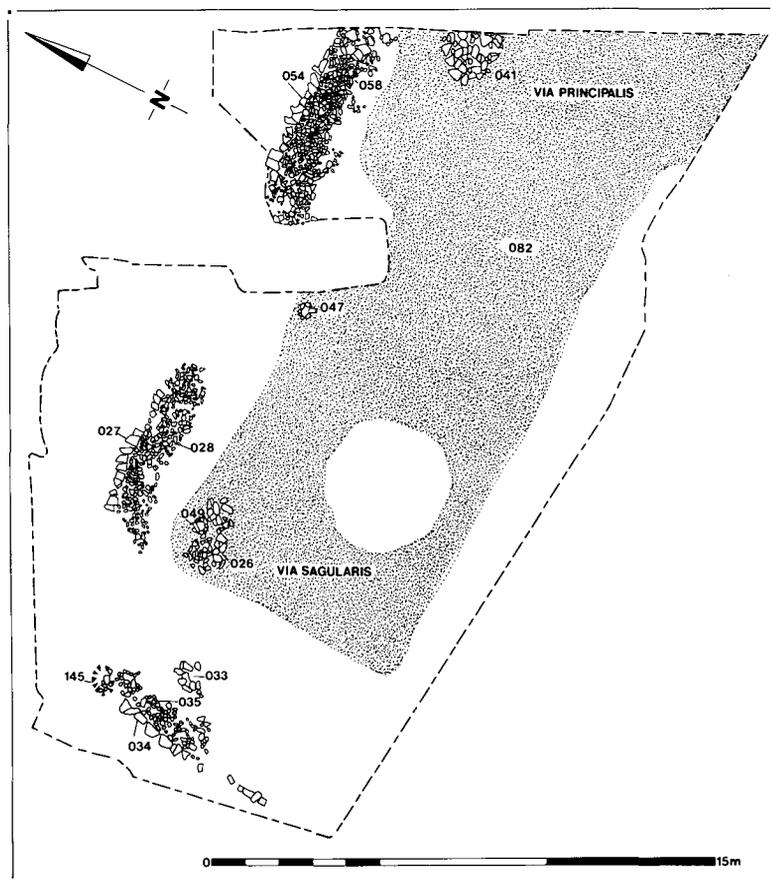


FIG. 40. Site 55: Fort IIb rampart modifications.

Fort IIb: modifications to ramparts (FIG. 40)

Evidence for a capping of the north, and possibly the west, ramparts in stone was recorded on Sites 55 and 69.

North rampart

On Site 55 a wall (027\054) was constructed on the crest of the rampart. This structure was formed from sandstone blocks bonded with yellow clay and survived to a height of only one, or in some places, two courses. The presence of layers of broken masonry [605] strewn down the front of the rampart here, however, suggests that the wall stood to some height. Against the south side of the wall was a layer (028\035\058) of round water-worn cobbles, up to 0.15 mm–0.20 mm in size, which encased the rear of the rampart and extended as far back as the Fort IIa *via sagularis* surface (082 – see below) sealing the filled [137] and levelled (038, 042) ‘french’ drain immediately to the rear of the rampart. One of these layers (042) extended southwards, where it overlay a pair of large circular (diameter *c.* 0.48 m) post-holes (047, 049) of uncertain function, but perhaps associated in some way with the early stages of this construction activity.

On the adjacent Loughor Access Road site, no certain trace of the capping wall was found, but traces of masonry and cobbles (051) on the top and to the rear of the rampart and a layer of broken masonry (096) forming a ‘scree’ running away from the front of the rampart in Area A perhaps indicate that similar arrangements to those on Site 55 existed here. Prior to the possible construction of the capping wall the front of the rampart in Area A had been repaired with clay and stones (039, 040). The ‘french’ drain here was also filled in (066\071).

West rampart

There was no apparent modification to the west rampart on Site 57, but on Site 55 a wall (034), 0.20 m wide, comprised of a single course of unbonded clay blocks, followed the line of the inner edge of the clay revetment (073), where it was joined by layers of mixed clay and turf (104–106), which covered a small building (Building 2.10 – see below p. 84) constructed in the lee of the rampart during the occupation of Fort IIa. At the junction of the west and north rampart, further traces of the cobble casing were recorded. A large, 0.88 m by 1.2 m by 0.38 m solitary stone-packed (144) post-pit (145), was cut into the top of the rampart at the north-west angle. This feature may have formed part of a corner-tower, but the rest of such a structure, had it existed, would have lain beyond the confines of the excavation.

Evidence for a tower at the south-east corner of the primary fort, but not the north-east, was recorded by Ling and Ling (1973, 106–9, 106 fig. 2). This was originally constructed as part of a single building operation at the same time as the fort wall, to which it was bonded (Ling & Ling 1973, 108), but there is no evidence to suggest when it was demolished, or whether it was re-used during the late Roman occupation at Loughor, apart from a coin of Constantine as Caesar found in silt above its ruins (Ling & Ling 1973, 119).

Discussion

The cobble casing of the north rampart is an unusual feature, and we have been unable to locate any parallels. It appears to be restricted to the north defences as no trace was found on Site 57 or in previous excavations. The dating evidence from the casing contexts and those immediately above it indicate a late Roman origin; there is no evidence to suggest that it could be a later feature, such as, for example, an outwork of the Norman castle. The casing was clearly associated with a wall surmounting the rampart. This perhaps replaced the earlier ?palisade recorded on Site 69 (above p. 78), and was perhaps required as a result of further dilapidation to the partially robbed Trajanic fort wall. The cobble casing was certainly not needed torevet the rear face of the rampart, which had remained in an intact and stable condition since its construction. It might be argued that the cobbles served to level further the ‘french’ drain to the rear of the rampart, but this feature had been filled in immediately prior to the construction of the casing; and, if this was the function of the casing, it would not have been necessary to seal the whole

rear face of the rampart. The casing does not appear to have had any obvious attributes that would have enhanced the defences, indeed the opposite must have been the case, as access to the top of the rampart would have been impeded.

Its function, if it did not simply serve to retain the wall capping the rampart (and in this regard would seem to be a somewhat over-elaborate measure) must be related to the reasons behind the re-occupation of the reduced fort in the late third century. As will be argued in greater detail later (Chapter 4), this was almost certainly in response to perceived sea-borne threats, rather than a renewal of the earlier policing function. Even taking account of changes in tidal reach and river flow, the north side of the defences was the closest to the estuary or river. Protection from attack from this quarter would no doubt have entailed the use of defensive artillery, whose general use was more prevalent in the third century (Campbell 1984, 81–4). As Campbell has argued, artillery need not be sited on the ramparts and for the larger pieces of equipment such arrangements would generally have been impracticable, as the forward-thrust and/or recoil when fired would weaken other elements of the defences. At Loughor, the north defences were terraced into a steep-sided glacial moraine, with the result that anyone standing on the *via sagularis* could see over the crest of the rampart; artillery sited here would therefore have still had a clear field of fire and the necessary height advantage over vessels in the river or disembarking troops.⁷ If this assumption is correct, then the casing, which was best preserved in the section of the north defences closest to the river (as the evidence from Site 69 is less certain) would have served to protect the rear turf revetment from the effects of movement during firing. Its extension back to the edge of the *via sagularis* would also have prevented the artillery becoming stuck in the slight depression left by the filled ‘french’ drain. One further factor that lends weight to this argument is the presence of stone heaps (026, 033, 041) above the *intervallum* road; these clearly do not derive from the demolition of the capping wall and are perhaps the remains of an ammunition stockpile.

Fort IIb: rampart modifications: dating evidence

The coarse pottery from Phase 10 on Site 55 (summarised by P. V. Webster below p. 344) and Phase 11 on Site 69 (but here from related contexts in the phase and not specifically from those associated with the modifications to the rampart) suggests that, whilst this activity cannot be dated with any great precision, refurbishment of the north and west defences in the last quarter of the third century would neither be inappropriate nor out-of-place with the more precisely dated activity occurring within the fort on Site 57 (see below p. 94).

Fort II: ditches (FIGS 11, 83)

As noted earlier the secondary ditches, accompanying the reconstruction of the defences in stone, gradually silted up rather than being deliberately filled. The span of this formation process cannot be dated precisely (see below p. 82) but there is some evidence from Site 69 to suggest that the ditches remained at least partially open until the middle of the second century. It is logical to assume that, as any hiatus between the abandonment of the primary fort and the construction of the reduced fort was probably fairly short the ditches of the primary fort continued in use with a fairly unchanged profile. New ditches were however constructed on the east and west sides of the reduced fort.

Two parallel ditches were located by Ling and Ling (1973, 109–110; 108, fig. 4, 110 fig. 5) on the east side of the fort; one of these was immediately outside the partially filled and roughly levelled secondary ditch of the primary fort. The outer ditch was only located in a single trench (A2) and appeared to stop before the corners of the fort were reached. At the north-eastern corner the inner ditch was protected by a type of *chevaux-de-frise* represented by shallow stake-holes 0.03–0.06 m deep spaced 0.07–0.40 m apart along its outer edge, a feature which may have served to compensate for the absence of the outer ditch (Ling & Ling 1973, 110). The fact that the inner ditch was not noted on Site 69 is explained simply by the fact that either the site did not extend far enough out to the north or that this ditch and its partner served only

to protect the east side of the fort, which unlike the other sides had no obvious natural protection. Apart from a shallow basal silt, both ditches were homogeneously and probably deliberately filled in the late third/early fourth century (Ling & Ling 1973, 110).

On the west side of the fort a ditch (3139) (FIG. 83), aligned north–south, was located in the extreme eastern part of Site 53. This roughly ‘V-shaped’ feature, 1.4–2.7 m wide and cut to a depth of 0.65 m, was similar in width to the examples excavated by Ling and Ling, but some 0.2 m shallower; however it was apparent that the upper part of the ditch had been removed in the post-medieval period. There was no evidence to suggest that the ditch had been recut, but the variable width and undulating nature of the sides implies that the feature had been subjected to periodic collapse and consequent repair. Apart from the basal silt, the feature had been systematically filled (3221–3), presumably when the defences of the reduced fort were slighted.

It seems likely that, by the time of the late third-century re-occupation, the ditches survived as shallow profiled features, and this hypothesis is reinforced by the absence of late material from their uppermost fills.

Fort II: ditches: dating evidence

The fills of the tertiary ditch on Site 69 produced coarse pottery (Nos 108–11) that need be no later than the first half of the second century, and the samian was also predominantly Flavio-Trajanic in date with a few pieces (including No. 42) dating to the middle of the second century. The layers overlying these fills, likewise, have produced predominantly material of first and second century apart from a few late sherds (including Nos 140 and 142).

Fort II: road system (FIGS 23, 24, 48, 46, 47)

It appears likely that, for the most part, the road system of the primary fort was adopted for the secondary fort; thus the *via sagularis* continued in use in Sites 55, 69, and 57. On Site 57 it was joined by a new *intervallum* road to accompany the new western line of defence. On Sites 55 and 69 the *intervallum* road was again joined from the south by other thoroughfares, but although the example on Site 55 presumably continued to function as the *via principalis*, that on Site 69 can now no longer be identified as the *via quintana*.

Fort IIa: the replacement via sagularis

North *via sagularis* (FIGS 23, 38)

On Site 55 the fourth resurfacing of the *intervallum* road in the primary fort, laid down in Phase 7, continued in use unchanged apart from where it was truncated to accommodate the new line of defences and by a curving gully (176), 9 m long by 0.4–0.6 m wide and up to 0.15 m deep filled with clay (175). This feature cut the south side of the *intervallum* road but had no obvious function. On Site 69 a new surface of densely packed small stones set in sandy clay (074), surviving to a width of 2 m, was laid down on top of the abandonment/levelling material deposited in Phase 7 (see above p. 73). The *intervallum* road here was served to the north by a shallow, 0.19 m, drain (102).

South and west *via sagularis* (FIG. 46)

The south *intervallum* road of the primary fort located on Site 57 was replaced by a new thoroughfare, which respected the south and west sides of the reduced fort. The new road was founded on ‘make-up’ deposits principally of cobble and stone but also incorporating some burnt material. In the south part of the site these had slumped into the well pit cut in Phase 8 (above p. 70). The west section of this road, c. 6 m wide, was represented by a single well-compacted surface of very small stones and pebbles, the south section by a similar deposit, c. 4.5 m wide.

North *via sagularis* resurfacing (FIGS 37, 40)

The north *via sagularis* on Site 55 together with the *via principalis* (below) was resurfaced in a single operation. The surface (082) was mainly made up of gravel and small stones up to 0.03 m in size, in a matrix of grey sand and grit. Along the line of the *intervallum* road this surface was repaired with two patches of metalling above a make-up of cobbles and clay.

On Site 69 the surface accompanying the reduction of the fort underlay the cobbled 'make-up' (061) for a new surface (059), 2.5 m wide, again comprised of small stones densely packed in a sandy clay matrix.

South *via sagularis* resurfacing

The south section of the *intervallum* road was resurfaced on at least five occasions but this activity was restricted to the area of the earlier well pit and is interpreted as localised repair necessitated by the periodic settlement of the layers filling the well.

Fort IIa: the *via principalis* (FIGS 24, 40)

As was the case with the section of the *intervallum* road on Site 55, it appears likely that the last resurfacing of the primary fort *via principalis* continued in use in the reduced fort. As noted above these roads were resurfaced (082) in a single operation. Along the *via principalis* the new surface overlay a 'make-up' (115, 140), 0.32 m deep, of a yellow-brown sandy silt up to 0.20 m deep with occasional pebbles below grey-black gritty loam up to 0.12 m deep with frequent pebbles. Both layers decreased slightly in depth towards the south (uphill) side of the site.

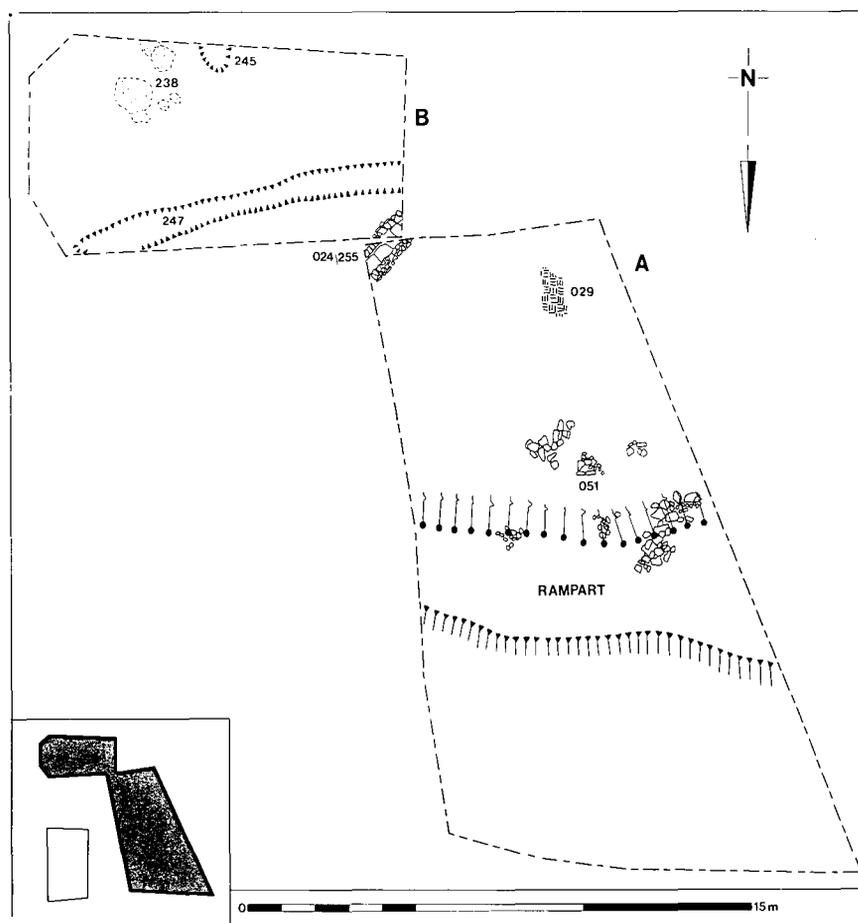


FIG. 41. Site 69: Fort IIb drains and road surface.

Fort IIa: other roads (FIG. 38)

A north–south road [382] was detected on Site 69 above the line of the *via quintana* of the first fort. It was represented by a surface of densely compacted small stones in a greyish-yellow silt sand matrix above cobble and sand make-up layers (263–5), 0.13–0.35 m thick. The road was served to the east by a drain, 0.6 m wide and 0.19 m deep, subsequently filled with clay, small stones, and charcoal.

Fort IIb: roads (FIGS 41, 51)

There appears to have been no attempt to refurbish the latest road surfaces laid down in Fort IIa, apart from a possible repair to the north–south road on Site 69, represented by a patch, 2.1 m by 1.5 m, of small cobbles (238), similar patching (080, 081) of the *via sagularis* on Site 55, and a surface laid down on Site 57 after the demolition of Building 2.14 (see below p. 92).

This layer, which overlay a make-up (026/050) of small pebbles and stone set in a pale yellow sandy clay, was represented by a patchy surface (014) of gravel and small pebbles set in a coarse grey sand matrix. It was found throughout most of the northern half of the site, and in turn underlay a dump of cobbles (011). The location and general extent of the surface suggests that it is probably the remains of a final resurfacing and relocation of the *via sagularis* of the second fort. Although medieval sherds were recovered from the surface, these are probably contaminants, and it should be noted that the surface was directly laid on the underlying deposits of certain Roman date. If it is accepted that 014 is the remains of the final *via sagularis* surface, then it is clear that the southern section of this road was moved some 2 m to the north of the surface laid down here in Fort IIa. In doing so the surface avoided the well pit, unlike the previous surface which consequently was repaired on a number of occasions (see above p. 82).

Fort IIa: buildings and other structures*Features and structures on the north side of the fort*

Site 55: Phase 8: Building 2.10 and adjacent features (FIG. 37)

The partial remains of a small rectangular building were detected to the rear of the west rampart on Castle Street. This building was represented by a slot (172), 5.2 m long, 0.40–0.64 m wide, and up to 0.10 m deep, cut alongside the rear face of the rampart and extant for 5.2 m. The mixed blue-grey clay and brown sand-silt fill (173) was similar in character to an ‘L-shaped’ stain (174), 0.20 m–0.26 m wide, representing the line of the north and east walls of the building, but which on excavation did not form a clearly defined slot. The north–south aligned arm of the slot, *c.* 2.0 m long, lay *c.* 0.4 m from the edge of the truncated *via sagularis*. The east–west part of 174 was not identifiable as a continuous feature.

A series of stone alignments (146, 161, 177) may have formed packing for these putative timbers. 146, 0.4 m wide, ran along the north side of the building for a distance of 3.6 m. Here, it may have linked with a concentration of flattish angular cobbles and boulders (177), *c.* 1.0 m by 1.2 m in plan by 0.17 m deep, located at the exterior angle of 174; this feature perhaps represents the position of a corner-post. 161 partially overlay the north–south arm of 174 and extended intermittently as far as the site baulk.

The building contained a clay floor (149) and two successive burnt features, probably either hearths or ovens. The earliest feature (163) survived only as an ill-defined area of clay *c.* 1.8 m by 1.4 m by 0.05 m deep, scorched to a red-brown colour in some parts, with isolated fire-fractured stones. The replacement structure was represented by a raft of cobbles (150), *c.* 0.10–0.15 m deep and covering a sub-rectangular area *c.* 1.0 m by 0.70 m, overlain by layers of scorched clay which covered all but the southernmost part of the cobble raft. Three successive crescent-shaped linings (141) open to the north were identifiable within the general spread of material [138] which was 0.10–0.15 m deep.

Three other successive burnt features with a similar function (the last illustrated on FIG. 37)

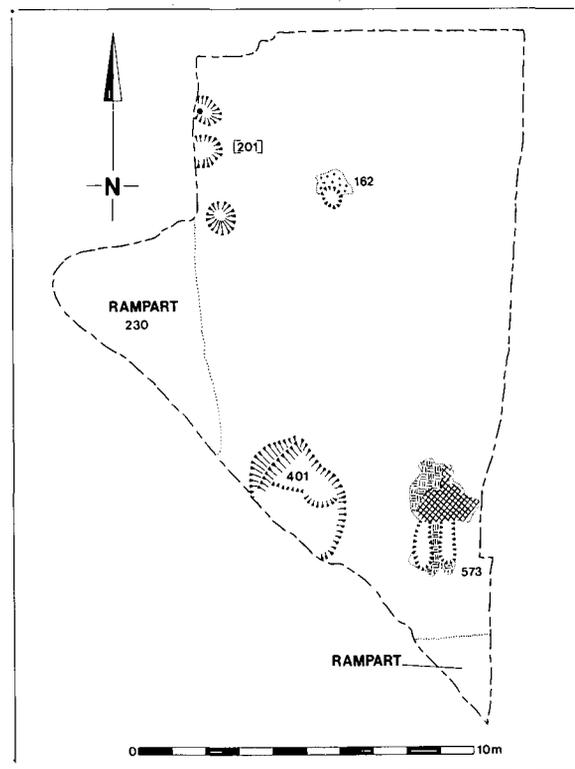


FIG. 42. Site 57: Phase 9.

were located to the south of the visible remains of the building and continued below the southern limit of excavation. The earliest feature, was represented by a sub-circular layer of grey-green clay (169) with a few flat angular cobbles of sandstone. Some of the clay had been scorched to a reddish-brown colour. The deposit had a central irregular bowl-like depression, 0.17 m deep, filled with a mixture of grey clay and light brown sandy silt loam (168) with a few pebbles and flecks of burnt daub and charcoal. 169 was replaced by a second burnt feature represented by another deposit of partly scorched grey-green clay, *c.* 1.8 m by 0.8 m in excavated extent. This burnt area showed signs of a lining with a number of surrounding cobbles and a stone slab forming part of the base. 164 was in turn overlain by a thicker deposit of similar clay (157) up to 0.13 m deep with a sunken central area (*c.* 0.6 m by 0.4 m) which was scorched red/orange; this depression was filled with a silt clay with a purple tinge to it (158).

Two other possible hearths or ovens were recorded *c.* 1 m to the north of the structure. One (165) was represented by a deposit of cobbles, 0.5 m by 0.7 m in extent and laid to a thickness of 0.1 m, contained within a matrix of brown-grey clay which showed slight evidence of scorching. The other (167), further to the north again was represented by a large stone slab surrounded by stones in a matrix of grey-green clay.

The function of the building and adjacent burnt features, probably hearths or ovens, is not particularly clear, mainly because the remains had been severely disturbed by or during the extension of the rampart associated with the Fort IIb activity (see above p. 80). The structure may have been more extensive than indicated by the surviving remains and enclosed the hearths/ovens to the north and south; whether this was the case or not these features were either temporary constructions in use when the west rampart of the reduced fort was raised or were related in some way to the activity taking place in Building 2.10; there was no certain evidence to suggest the use of the building.

Site 55: building 2.10: dating evidence

Building 2.10 was in use during Phases 8 and 9. Finds from this area were relatively scarce; such material that does survive is not inconsistent with a date in the second half of the second century.

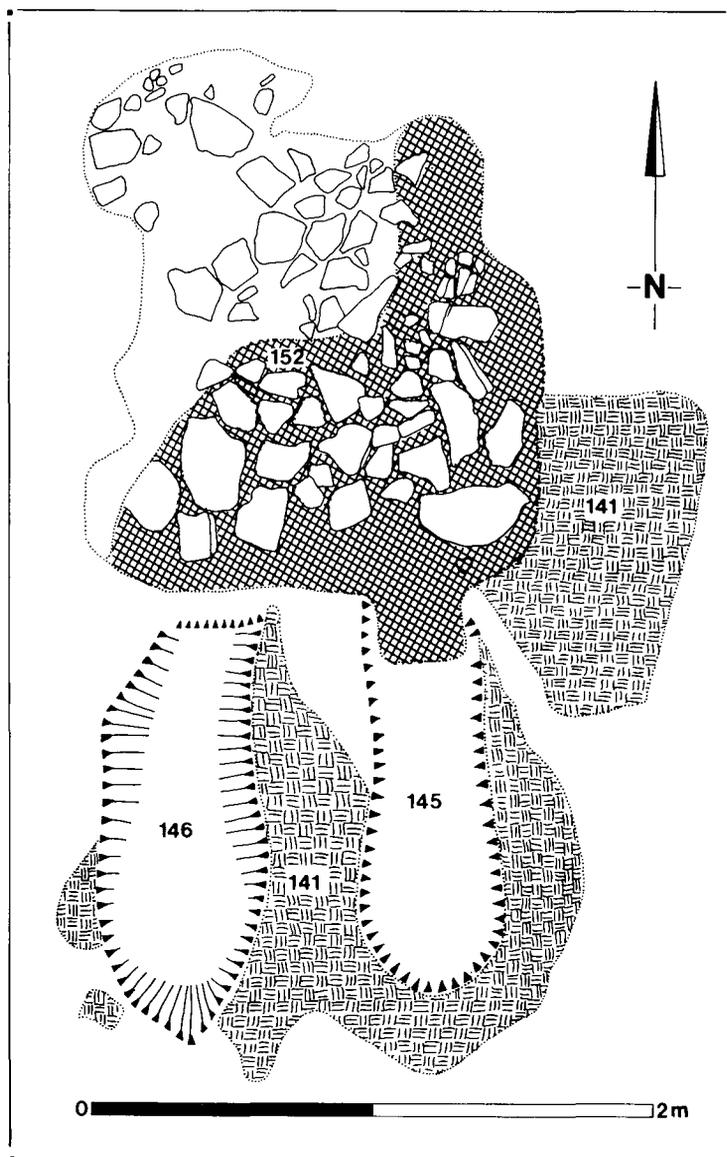


FIG. 43. Site 57: Oven/Kilns 145 and 146.

Site 55: fills to the rear of the north rampart and hearth (087\102) (Not illustrated)

The depression to the rear of the rampart continued to be levelled [137], a process that went on well into the second century. One of these deposits (108) was overlain by a small hearth (087\102), measuring *c.* 0.5 m by 0.3 m by 0.2 m deep, sited near the west limit of excavation. The structure was made up from yellow sandy clay which was mostly scorched to an orange/red colour, together with some fire-fractured slabs of sandstone. A soft brown-black organic layer with flecks of burnt clay and wood (103) was directly associated with the structure, immediately to its south. This levelling process was continued after the abandonment of Fort IIa with the uppermost layers (038, 042) dumped prior to the construction of the cobble casing of the north rampart (above p. 80).

Site 69: fills to the rear of the rampart (FIG. 23)

The earth-cut drain to the rear of the rampart was gradually filled (061\071, 119).



PLATE XII. Site 57: Buildings and structures in the reduced fort: Building 2.13 left foreground, Building 2.14 post-pits centre, Oven/Kilns 145 and 146 left background, looking south (2 m scales).

Features and structures on the south side of the fort (FIGS 42, 43, 44; PL. XII)

Site 57: Phase 9: Burnt Structures 162 and 573, and Pit 401 (FIGS 42, 43, 44)

Two burnt structures were located to the east of the west rampart of the reduced fort. The smaller structure (162) was recorded in the northern half of the site. The larger structure (573) had severely slumped into the south side of the well pit (PL. XII).

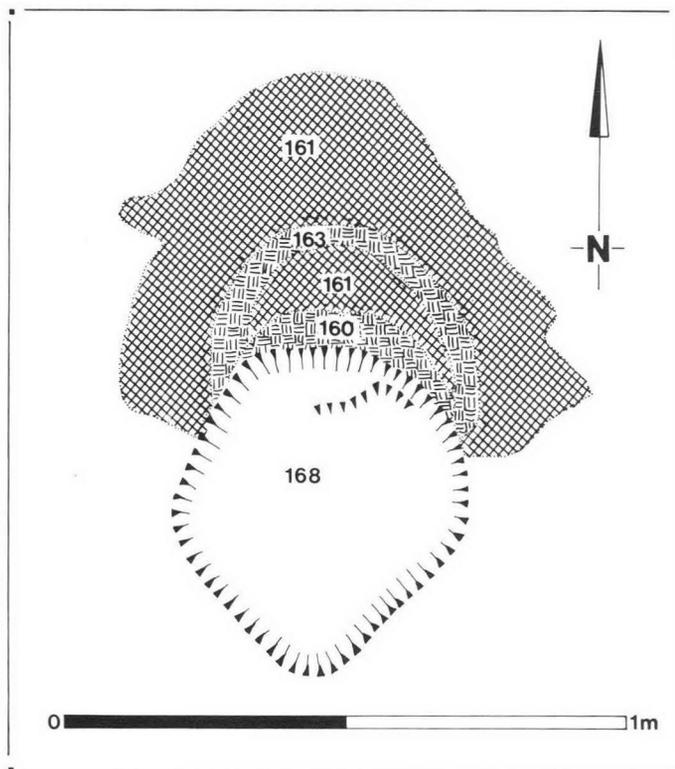


FIG. 44. Site 57: Hearth 162.

573 was represented by two roughly oval chambers (145, 146), which had been cut through the north end of a spread of clay (141) subsequently burnt. 145 measured 0.5 m (max.) by 1.52 m by *c.* 0.3 m and was filled at the south end with a layer (143; not illustrated) of ash containing some tile and daub and at the north end with a similar deposit but containing more tile (147; not illustrated). The other feature (146) measured 0.6 m (max) by 1.4 m by *c.* 0.35 m and had a similar sequence of fills (144, 148; not illustrated) including some box-tile. At the south end of these features a stokehole was represented by flat sandstone slabs and tile set into a layer (152) of partially scorched yellow clay measuring at its maximum extents 1.42 m by 1.8 m. Removal of this deposit exposed a shallow, 0.05 m, depression (178; not illustrated) measuring *c.* 1 m by 0.5 m around the north edge of which a 0.05 m thick clay lining was observed. The depression had been filled with a grey-brown sand deposit (180; not illustrated). There was no evidence to suggest that the two chambers were not in use at the same time. Fragments of lead and iron waste, recovered from the layers filling the partly demolished chambers, indicate an industrial use, but did not survive in sufficient quantities for the precise use of the features to be determined.

162 was represented by a shallow, 0.12 m, roughly circular, 0.54 m by 0.56 m, depression (168), which had been filled with a layer of dark grey ash (159; not illustrated). A crescent-shaped band of burnt clay (160), 0.05 m thick, was located around the north side of the depression. This was separated from a further semicircular band of burnt clay (163), 0.04 m thick, by a layer (161) of dark grey clay and gravel, which was also located to the north, east, and west of 163. Removal of these deposits revealed a layer of gravel (165; not illustrated) on which a layer of blue-grey clay was set (164; not illustrated). The feature underlay a spread of burnt daub (067; not illustrated). The function of 162 is uncertain.

In the central southern part of the site a large, 3.4 m by 2 m (min) by 0.7 m, pit (401) of uncertain function was cut. This feature was filled with rubbish deposits [572]; the lower three contained appreciable quantities of charcoal; the upper two were of clay and stone.

Site 57: dating evidence: Phase 9

The greater part of the pottery is residual and of Flavio-Trajanic date, however there are sufficient coarse wares (Nos 238, 240) to suggest a late second-early third-century date and this activity is probably best seen as being contemporary with that associated with Phases 8 and 9 on Site 55 (above p. 85).

Fort IIb: buildings and other structures

Features and structures on the north side of the fort (FIG. 47)

No features or structures were found on Site 55 that were contemporary with the capping walls and cobble casing of the rampart and the final road surfaces.

Site 69: Phase 9: Building 2.11 (FIG. 38)

Part of a timber building was located in the south part of Area A and the west half of Area B. Although its function is unknown, evidence for the method of construction and a limited part of the ground plan were recovered. The superstructure may have been at least timber-framed, but no evidence for the form (e.g. wattle-and-daub, timber cladding) survived. The building was founded on beams set in identically filled [388] slots 0.32–0.39 m wide. In Area A a slot (104) was located immediately adjacent and parallel to the north side of the *via sagularis* drain. This feature, 0.30 m deep, was joined from the south by a short length of trench of similar dimensions (108), which had slight traces of a possible post-hole at the junction. Both these features defined a clay floor (008) which was cut by a small pit and a stake-hole. In Area B a slot (292), 0.34 m deep, defining the eastern limit of the building was recorded fronting the road approaching the *via sagularis* from the south. It was joined from the west by two further foundation features (414, 415), which enclosed a clay floor (275).

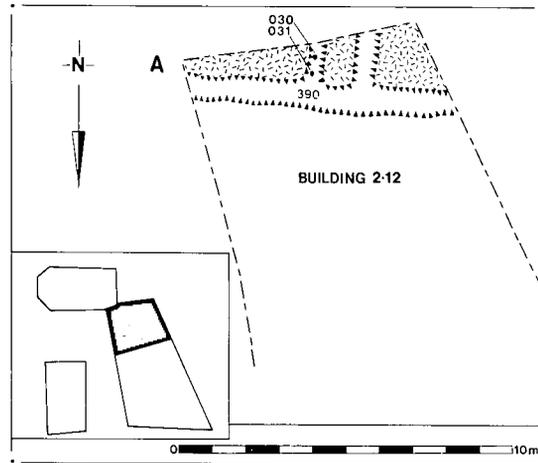


FIG. 45. Site 69: Building 2.12.

Site 69: Phase 10: Building 2.12 ((?) modified Building 2.11) (FIG. 45)

Building 2.12 appeared to be the direct successor to Building 2.11, but structural evidence was only encountered in Area A. Either these remains represent a modification of Building 2.11, or alternatively the replacement structure did not extend as far to the east. The superstructure may have been timber-framed, although no firm evidence, apart from faint traces of daub walling sunk into one of the foundation slots, for the form (e.g. wattle-and-daub, timber cladding) survived. This building was, however, founded on a base of beams laid in similarly filled [390] slots. Three slots [389] were recorded, one running parallel to the *via sagularis*, the others joining it from the north. The slots were 0.3–0.6 m wide and 0.12–0.17 m deep. One of the slots contained two stake-holes (030, 031), perhaps representing the position of uprights morticed through the base-plate. For the most part the floor surface of Building 2.11 appeared to have been reused, apart from one small area where a new surface was laid down (094, not illustrated). Whilst these remains clearly formed part of a building, too little survived for any conjecture to be made as to its function. In Area B, the building underlay a widespread demolition deposit (227) containing *c.* 60 per cent charcoal lumps and flecks, *c.* 0.10 m deep. This deposit also overlay the adjacent north–south road.

Site 69: Buildings 2.11 and 2.12: dating evidence

The dating of Buildings 2.11 and 2.12 is difficult, the greater part of the material is residual (entirely so for Phase 9) and Flavian-Trajanic; however as Webster notes (below p. 350) sufficient survives to suggest that Phase 10 can probably be dated to the mid–late third century. The close stratigraphic relationship of these (?)two buildings implies that there is unlikely to be much of a hiatus between their periods of use or that Building 2.11 stood vacant for any great period before it was modified or rebuilt. On this basis it is likely that a mid–late third-century date should be preferred, and if so then they are likely to be contemporary with Building 2.13 on Site 57.

Site 69: Phase 11

On Site 69 the demolished remains of Building 2.12 were cut by two drains, one stone-lined; these features were probably contemporary with a group of pits encountered in Areas A and B.

The stone-lined drain [024\225], which ran south-west–north-east (i.e. at 45 degrees to the alignment of the fort) consisted of two walls (068, 069\252) formed from flat sandstone fragments bedded in sand set on a base of flat sandstone slabs (067\262) resting on foundations (072\269) of broken sandstone masonry fragments and mortar in a matrix of brown–yellow sand. Each wall was 0.32 m wide and stood to a height of 0.41–0.46 m. The walls were spaced 1.15 m apart. The inner face of each wall was faced with a daub lining (058\411), 0.05 m thick.

The central drain void was filled with clay, charcoal, daub, small stones, sand and slag mixed together in two discrete deposits (054\236, 057\237). The alignment of the feature did not respect that of the fort, but given the ascribed function this is of little relevance; the finds were exclusively Roman.

An earth-cut gully (247) aligned east–west was located *c.* 2 m to the south-east of 024\225 and traversed the whole of Area B. The feature, 0.67 m wide and 0.38 m deep, was most probably a drain and contained two fills (235, 243). The only other features of note were two rubbish pits (245, 412); the former containing two fills (234, 246), the latter one (254). A layer of clay (029) in Area A above the remains of Building 2.12 may be associated with this activity.

Site 69: Phase 11: dating evidence

The greater part of the material from this phase is residual but sufficient survives from the phase as a whole to confirm a late third- or very early fourth-century date.

Features and structures on the south side of the fort

Site 57: Phase 10: Building 2.13 (FIGS 25, 46)

The Phase 9 contexts were covered by dumps of clay and burnt material [574 (see FIG. 25 for Context 063)] prior to the construction of a new *intervallum* road and Building 2.13.

Building 2.13 was an earth-fast timber building founded in rectangular-profiled slots, 0.40–0.53 m wide and up to 0.33 m deep, filled with dark yellow-brown sand and silt incorporating gravel and the occasional sandstone masonry fragment (see FIG. 25 for 082). The superstructure would almost certainly have been timber-framed, but no evidence for the form (e.g. wattle-and-daub, timber cladding) survived. Within the site the structure encompassed an area of *c.* 30 m²; the sharp rise in the ground slope to the north of the site and the almost certain continuation in use of a road along the line of the earlier *via principalis* to the east would have limited the possible extent of Building 2.13. A building of maximum dimensions of *c.* 15–20 m north–south by *c.* 6–10 m east–west is probably to be envisaged. The building was floored in

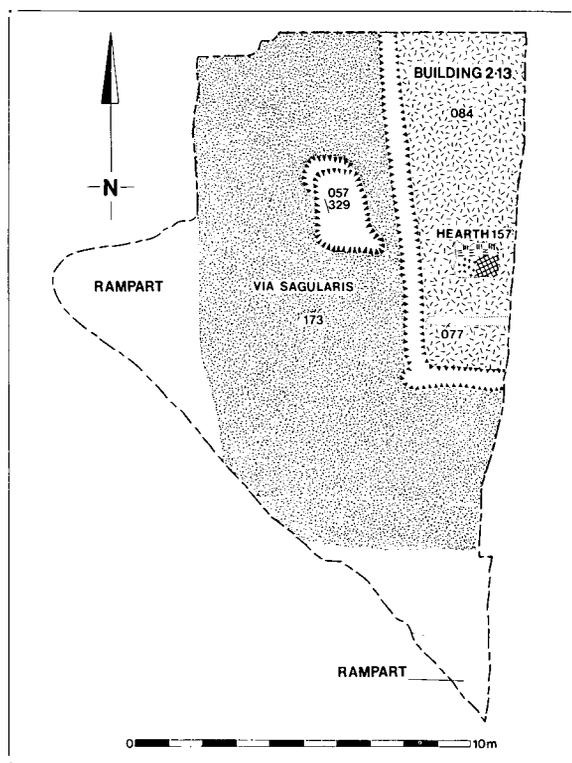


FIG. 46. Site 57: Phase 10.

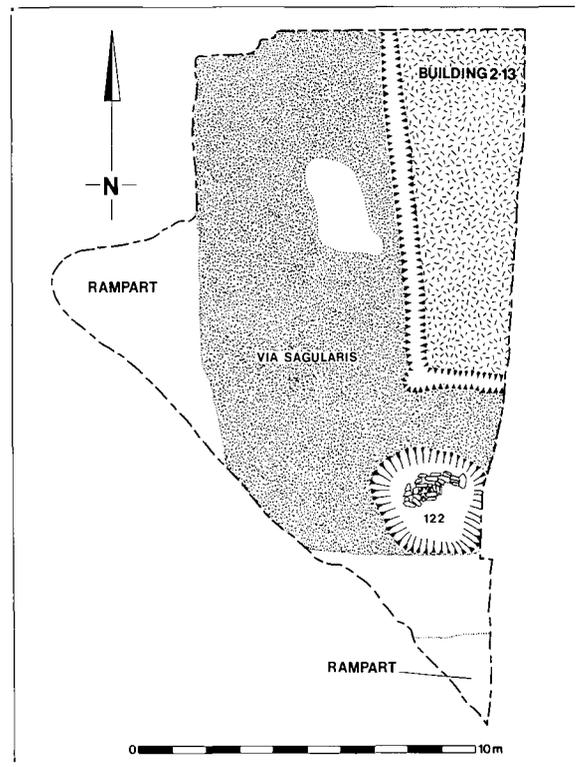


FIG. 47. Site 57: Phase 11.

clay (084; FIG. 25), which was perhaps cut by a further possible slot, 0.2 m wide, located 1.5 m from the south end of the building; this only survived (077) as a linear change in the soil colour and was virtually impossible to excavate. Other internal divisions were not observed, but given the difficulty in detecting them, such divisions may not have been recognised. Alternatively any partitions may have stood on the floors. A slight depression filled with a layer (157) of burnt clay and charcoal was located *c.* 1 m to the north of 077 and perhaps represented the remains of a hearth. The function of the building is unknown.

A roughly rectangular, 1.5 m by 2.6 m, pit (057\329) was cut through the west section of the *via sagularis*. This feature, which was 0.7 m deep, was filled with layers of clay, stone, and burnt material [575].

Site 57: Phase 11: modifications to Building 2.13 and Structure 122 (FIGS 47, 48)

Building 2.13 was re-floored with a layer of yellow-brown sandy clay (062). The absence of traces of burnt demolition debris above this level perhaps implies that the building was dismantled rather than burnt down.

In the south-east corner of the site, the depression caused by the slumping of the Phase 10 road surface into the earlier well-pit was filled with layers of clay, stone, and gravel [129], with a combined thickness of 0.25 m. The uppermost of these deposits lay within the well-pit slumping (*c.* 0.5 m below the top edge of the well), above them rested a roughly 'L-shaped' stone structure (122), severely disturbed both during demolition and as a result of later subsidence into the well-pit. This feature, in size 1.80 m by 0.92 m with a central void 0.33 m deep, was constructed from sandstone slabs and blocks in places cracked and reddened. In shape it was reminiscent of so-called 'corndryers', but this function cannot be definitely assigned to the feature.

Site 57: Phases 10 and 11: dating evidence

The small quantities of material recovered include sufficient coarsewares to suggest a mid-late third- or early fourth-century date. Given the more empirical dating evidence for Phase 12 (below p. 94), a mid-late third-century date for this activity is preferred.

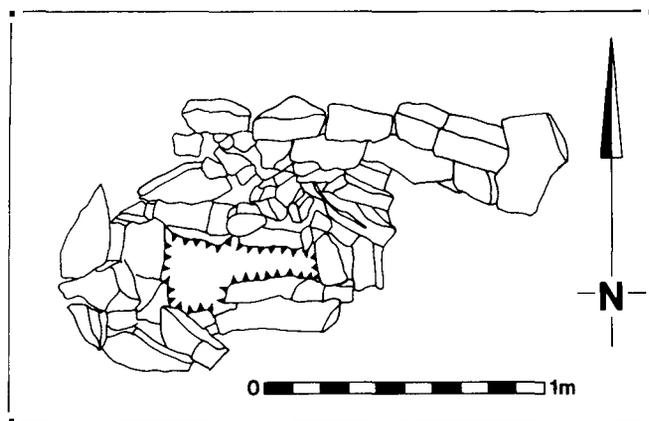


FIG. 48. Site 57: 'Corndryer' 122.

Site 57: Phase 12: Building 2.14 and other features (FIGS 25, 48, 49)

At the start of Phase 12, the well-pit was further filled in with layers [576] comprising a mixture of burnt material and sandstone fragments, perhaps derived from the destruction of Building 2.13 or alternatively the possible corndryer (122). In the latter case it is possible that the material had not been dumped into the pit but rather had been levelled out around the corndryer and slumped at a later stage. In either case, it is a significant deposit in dating terms as it contained two coins of Carausius (Nos 74, 75), thereby providing a relatively secure *terminus ante quem* for Building 2.14, as part of that structure disturbed these deposits. Another late third-century coin (No. 69) was recovered from a dump of material 059\062 (above the remains of Building 2.13; FIG. 25 for 059), which was also cut by the basal elements of Building 2.14.

Building 2.14, located in the southern and central parts of the excavation in the angle between the two sections of rampart, encompassed an area of at least 81 m². Within the confines of the site the structure was represented by a series of stone packed post-holes. There can be little

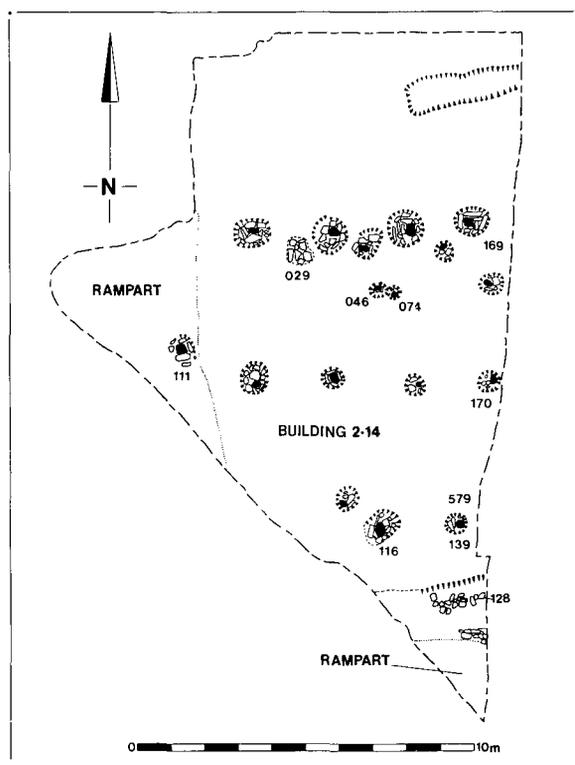


FIG. 49. Site 57: Building 2.14.

doubt that these features represent some form of building, the function and structural arrangements of which are, however, less apparent.

The post-pits were all roughly circular in shape (av. diameter 0.78 m) and cut to an average depth of 0.54 m. These contained the settings for what were presumably the principal uprights. For the northern exterior and the central walls evidence for these uprights is reasonably secure (Post-lines 169 & 170). Each pit would have contained a single post held in place by layers [577] of sandstone masonry fragments and cobbles tightly packed together. The post-settings were the same depth as the pits; most were circular or oval in shape (diameter range 0.12–0.40 m) but five examples were square or rectangular, the smallest 0.16 m by 0.20 m the largest 0.43 m by 0.31 m. All contained layers [578] of dark brown sandy silt with occasional pebbles and small sandstone masonry fragments. The post-pits cut the underlying *via sagularis* surfaces, pits, and features associated with Building 2.13 (above p. 90). Two pits (116, 139) cut layers filling the well-pit slump, another (111) the rear of the western rampart. All the post-pits were apparently contemporary except 046, which cut 074.

The building appears to have had three principal walls, each aligned east–west. Two of these were represented by two lines of post-holes (169, 170). The more northerly consisted of a double line represented by four larger posts, two smaller examples, and a post pad. The other consisted of five posts, but the one (111) at the western end was offset. The third, less certain, wall line was represented by a line of three post-pits [579] recorded near the southern limits of the site. Although here the evidence is less certain, if the posts in this line were similarly spaced to those in 169 then the other examples would have been sited beyond the limits of the excavation at this level (given the drop in slope of the railway cutting). The lines of posts were spaced 4.25 m apart and the posts 2.3 m apart with two exceptions – the eastern two examples in Line 169 at 1.75 m and the posts to the south of 169 at 3.3 m.

Apart from the post-settings, no evidence survived for the nature of the superstructure (the principal uprights' primary function would have been to support the weight of the roof, walls of timber cladding or wattle-and-daub panels could have been easily attached to the uprights) or the material used to floor the building (this may be either because the underlying *via sagularis* surfaces together with the floor of Building 2.13 were sufficient or perhaps because the building had a suspended timber floor).

Although all the posts had the same stratigraphic relationships (with the exception of 046), the presence of the double line of posts and in particular variations in the size of the post-pits suggest that more than one phase of structural activity is represented. A number of possible models of the sequence of structural activity for Building 2.14 can be proposed (FIG. 50). The three suggested here represent the three likely original ground-plans of the building, although it is accepted that variants of these are possible. In the first model the structure is represented by the six large posts in Lines 169 and 579 which would have formed the structural supports of the outer walls. In the second model a basilica-type structure is implied. In this instance the six large posts represent the position of the nave with the outer walls of the ambulatories carried on free-standing sill-beams: this is probably the least likely model. In the third case the six large posts form the outer walls of a building with a central partition along its long axis represented by Post-line 170. In all three models the remaining posts with three exceptions on the north side, but including 111 on the west side, may have been inserted to provide additional support and stability. The exceptions are the two posts approximately half-way between Post-lines 169 and 170, which may have been part of the original construction, particularly in the first and third models, perhaps representing a partition or entrance porch; although the fact that these are not parallel with the posts in Lines 169 and 170 may imply that they and the post (046) replacing 074 were also inserted to shore up a sagging building.

The function of the building is not certain. Post-pit construction is the simplest for securing an earth-fast timber building and is found in gateways, interval- and corner-towers, granaries, barracks, and ancillary buildings. Given the building's position, close to the junction of two sections of rampart, it might be argued that Building 2.14 is most likely to be a corner-tower or a building attached to a corner-tower. But its size, its position to the rear of the rampart, and particularly its alignment militates against such a suggestion. If not a corner-tower or an annexe

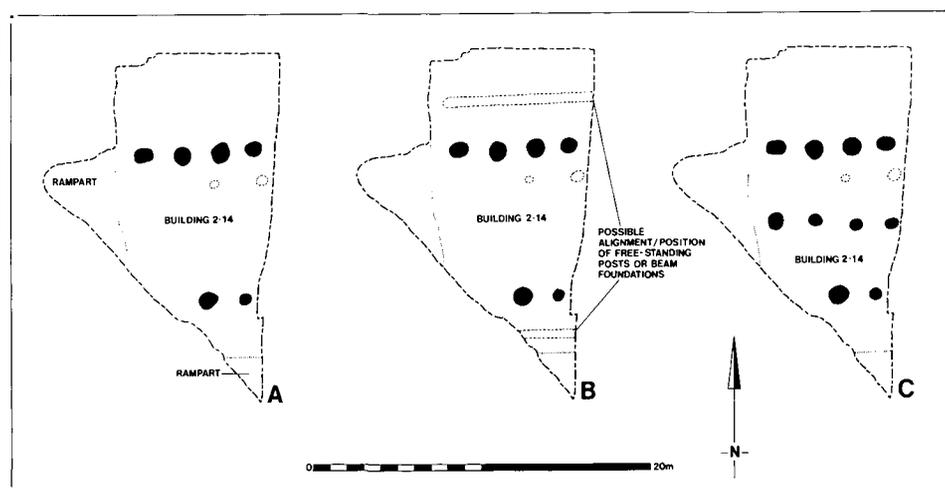


FIG. 50. Alternative groundplans for Building 2.14.

to a corner-tower, then some other explanation of the building's possible function needs to be sought, and furthermore an explanation in which size will be an important factor. Unless the building crossed the *via principalis* then its potential maximum length would be 18–20 m. A building of this order is unlikely to have been a barrack, and a function as a stores, workshop, or stables seems most likely, but the massive size of the post-settings seems inappropriate for buildings of these types.

Building 2.14 may have been flanked by two drains. The larger, 'U-shaped' ditch, 1.6 m wide by at least 3.1 m long and 0.9 m deep, was cut immediately to the rear of the rampart. It contained the remnants of two parallel stone walls, most of which had been removed by the cutting of the railway embankment in the nineteenth century. The best preserved example was the northern wall (128), which in section was 0.45 m wide. The space between the walls, at 0.6 m, was filled with a deposit (135) not fully recorded on site. The smaller drain (058) was represented by a gully, 0.36 m deep, located to the north of Building 2.14. It was filled with a layer (016) of dark brown silt containing large sandstone slabs and some small pebbles.

A layer (025) of small stones and pebbles in a dark brown silt clay and loam covered the underlying road surface (028) to the north of Building 2.14. It may have been an attempt to resurface part of the *via sagularis* but is probably better interpreted as a levelling dump.

Site 57: Building 2.14: dating evidence

The late third-century dating of Building 2.14 is secured on the numismatic evidence already noted; this is reinforced by other finds of similar date (e.g. coarse pottery, No. 271).

Fort IIb: post-abandonment deposits

A number of deposits were encountered on the sites across the north defences which can be associated with the final abandonment of the fort or decay following the departure of the last garrison. On the south side of the fort the final road surface (57\014; above p. 84) lay directly beneath the lower post-medieval garden soils.

On Site 55 the collapsed masonry down the front of the rampart, derived from the late capping wall [605], has already been noted. The remainder of the rampart and the depression/drain to its rear were covered by mixed deposits of clay, stone, and cobbles (019, 020, 045), probably derived from the gradual weathering of the cobble rampart casing. The adjacent roads were covered by an extensive layer of silt (036), 0.15–0.8 m deep, which appears to have gradually accumulated following the abandonment of the fort.

A similar pattern appears to have occurred on Site 69. Here material from the gradual collapse of the partially robbed fort wall, the presumed later capping wall, and the rampart overlay the

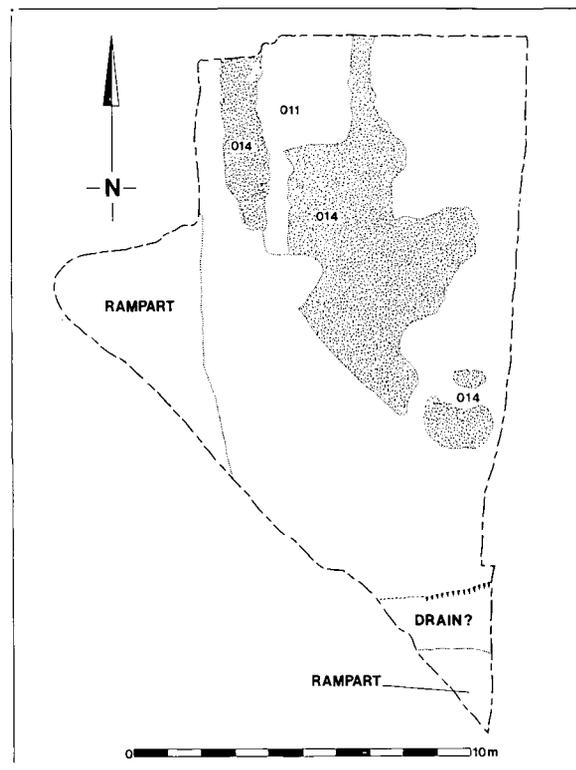


FIG. 51. Site 57: Phase 13.

ditches [385 (see FIG. 11 for 312, 316, 319, 324, 334)]. Elsewhere material accumulated above the rampart and the depression to its rear (005; FIG. 23), and over Area B (226) to a depth of 0.13–0.32 m.

Finds from these deposits included appreciable but small quantities of late third-early fourth-century material.

EXTRA-MURAL STRUCTURES

THE BATH-HOUSE (Building 2.15)

Introduction

As discussed in greater detail above (Chapter 1), prior to the excavations of the early 1970s, the suggestion that a Roman fort was situated at Loughor was based largely on the discovery of a bath-house during the construction of the Great Western Railway in the early 1850s. The excavations undertaken in 1982–84, therefore, provided an opportunity to test the claim that this structure had been preserved beneath the railway (although this was not part of a deliberate research design). Parts of two sites (54 & 66) were located as close as was safely possible to the railway line. The area to the west of the line (Site 66 Area A) proved to be sterile, any remains having been removed by railway sidings and associated workshops; that located on the east side (Site 54 Area A) proved to be more productive.

The structural remains (FIGS 52, 53)

Two walls (053, 059) joining at right-angles defined the north-east corner of a room which appeared to continue underneath the railway. The walls, 0.75 m wide and surviving to a height of 0.9 m, were of coursed rubble construction with dressed Pennant sandstone blocks enclosing a rubble core; the lime and sand based mortar had inclusions of tile, grit, and charcoal. The walls rested on foundations (179, 180) of broken stone and tile laid in trenches 0.8 m wide and 0.45 m deep. The badly weathered primary floor of *opus signinum* (178) rested on a foundation

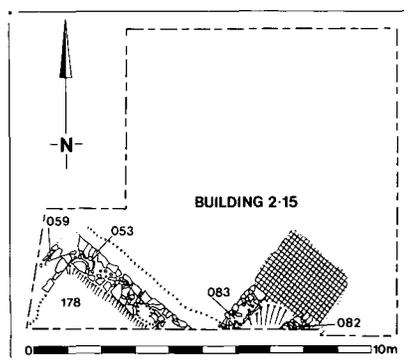


FIG. 52. Site 54: Bath-house.

of small cobbles and stones. The room was refloored on at least three occasions (057, 168, 176). It was apparent that the floors had been finished with quarter-round moulding against the inner faces of the walls; marks in the final surface (057) showed clearly the impressions of the timber shoring used to hold the 'wet-mix' in position.

The flue and stoke-hole (PL. XIII)

The remains of a stone-lined flue and adjacent stoke-hole were recorded immediately to the south of the room described above.

The flue was set in a sub-rectangular construction pit (159), 2.8 m wide by 1.06 m deep, which served to contain both the flue and the stoke-hole; the latter feature had been mostly cut away by a later timber-lined ditch (above p. 48). Two walls (082, 083), 0.65 m wide and 1 m apart, each with an inner face of flat sandstone slabs bonded with clay, were built within and on either side of the construction pit; the gap between the core of the walls and the edge of the pit was filled with sand, gravel, and occasional cobbles (162). The lowest thirteen courses of the walls stood to a height of 0.8 m; above this level the height of the flue was then increased by at least 0.4 m through the addition of two narrower, c. 0.2 m wide, walls (160, 161), formed from sandstone slabs bonded with clay. The appearance of both walls, but particularly the southern example, suggests that these may have served as springers for an arch over the flue.

An initial burnt residue (158) in the flue and stoke-hole, was overlain by a silt, 0.2 m deep, perhaps derived from flooding. Although this deposit was not removed, it seems likely that the flue continued in use as it was in turn overlain by a further burnt residue (156) representing further firings before the flue was partially blocked with clay and burnt residues [186]. This material was overlain by the residues from the final firings (070, 149).

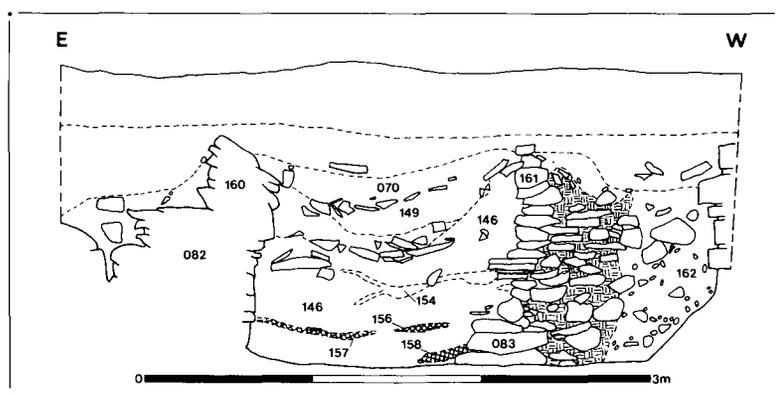


FIG. 53. Site 54: Section across Flue 071.



PLATE XIII. Site 54: Bath-house flue (0.5 m scales).

Dating

Only small quantities of material were recovered from the bath-house. Such material that was recovered is, however, consistent with construction and occupation in the first decade of the second century. The construction of the timber-lined ditch, above p. 48, probably as a result of a slight adjustment of the defences, when revetted in stone, would have resulted in either the decommissioning of the bath-house, or possibly just the repositioning of the flue: in either case this part of the building would have gone out of use.

Too little of the baths survives for any meaningful interpretation to be advanced. It may, however, be noted that the accounts recording the discovery of the bath-house (Chapter 1 above p. 10) noted 'the presence of tiles embedded into the floor of the baths'. Our flue may have served to heat this (?) hot room, and if so the un-hypocausted room, partly exposed in our excavations, may have been an adjacent warm room.

APPENDIX: CONTEXT PHASE LISTS AND GROUP NUMBERS

Context phase lists

Lists of context numbers ordered by stratigraphic phase for each site described in Chapter 2 are given below. The list includes all numbers, including voids (i.e. negative features) and structure numbers and commences with those that can be assigned to the earliest phase of activity. Contexts are placed in the earliest phase group possible.

Group numbers

Wherever possible groups of contexts have been collectively numbered to reduce intrusion into the text of the structural report. The lists below only include the group and context numbers for groups of layers in order to facilitate reference between the structural report and the finds reports. Other group numbers in the text provide a link with the archive and report plans. Some finds were collected during cleaning of the site prior to photography and were recorded either under numbers assigned for this purpose or under the building numbers; these are given at the end of each list.

SITE 55

Context phase list*Phase 1*

327–441, 464, 465, 471–474, 477, 481, 482, 484, 487–533, 566, 567, 575, 578, 591, 594

Phase 2

114, 283, 284, 305, 306, 309, 310, 314–317, 322, 442–445, 447, 456, 458, 460–463, 467–469, 478–480, 483, 485–486, 534–565, 568–574, 576, 577, 583–586, 589, 590, 597–599

Phase 3

279, 298, 303, 304, 307, 308, 449–455, 463, 466, 475–477, 580–582, 595

Phase 4

273, 278, 288–297, 300–302, 446, 448, 596

Phase 5

257–263, 265–271, 274–277, 280–282, 285–287

Phase 6

170, 186, 190, 204, 205, 242, 250, 256, 264, 272, 273

Phase 7

092, 107, 109–112, 122–125, 129–133, 135, 180–203, 206–216, 218–241, 243–249, 254, 255, 257, 312, 323–326, 457, 468, 587, 600, 601

Phase 8

039, 040, 073, 086, 087, 102, 103, 108, 126, 128, 134, 138–143, 146–150, 154–158, 160, 161–178, 251–3, 311, 318–321, 588, 592, 593, 602

Phase 9

050, 065, 082–085, 093, 095, 096, 101, 115, 121, 127, 137, 140, 217, 603

Phase 10

026–028, 033–035, 038, 041, 042, 046–049, 051, 054–059, 064, 066, 069, 074, 080, 081, 088–091, 099, 100, 104–106, 116, 136, 144, 145, 159, 579, 604

Phase 11

001–025, 029–032, 036, 037, 043–045, 052, 053, 060–062, 067, 068, 070, 071, 075–079, 097, 098, 113, 117, 118, 151–3, 459, 470, 605

'Cleaning Contexts'/Unstratified

063, 072, 094, 119, 120, 179, 299, 313

Group numbers

<i>Phase</i>	<i>Context (Group No.)</i>	<i>Contexts</i>	<i>Function\Identity</i>
1	481	327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425,	Layers filling stake-holes in marking-out line 441

		427, 429, 431, 433, 435, 437, 439, 484	
1	482	493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533–575	Layers filling stake-holes in marking-out line
1	594	487–492, 566, 567, 578	Quarry scoops
2–3	597	536, 538, 540, 542, 544 546, 548, 550, 552, 554 556	Building 2.2 post-hole fills
2–6	445	322\442, 443, 444, 456, 480, 483, 534, 559, 562, 571, 577, 579, 583, 589, 590	North rampart in primary fort
2–6	599	205, 246, 250, 280, 281, 285, 300, 301, 304, 308 310	Layers filling Drain 458 to the rear of north rampart in primary fort
2–7	279	155, 183, 191, 245, 254, 255, 278, 453, 454, 466, 580	<i>Via principalis</i> in primary fort
2–7	598	123, 162, 170, 180–182, 184, 185, 242–245, 256, 262–264, 269, 273, 274, 276, 277, 282, 288, 290– 292, 297, 300, 307, 582	<i>Via sagularis</i> in primary fort
7	600	196, 198, 200, 202, 206, 208, 210, 212, 214, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238 240, 322, 325	Layers filling post-holes in Post- trench 249, Building 2.5
7	601	076, 092, 109–111, 122, 124, 125, 312	Fills of Cut 112\135, battering of north rampart for stone wall
8	602	157, 158, 164, 165, 167– 169	Hearths outside Building 2.10
8–11	138	040, 066, 073, 086, 104– 106, 116, 154, 159, 171, 178	West rampart of reduced fort
9	217	065, 080–082, 093, 095 140	<i>Via sagularis</i> in reduced fort
9	603	082, 115, 140	<i>Via principalis</i> in reduced fort

9–10	137	050, 083–085, 101 108, 121, 127	Layers filling Drain 039 to the rear of the north rampart in the reduced fort
10	604	046–049, 055, 056	Post-holes to rear of north rampart
10	136	027, 028, 034, 035, 054, 058, 074	Stone rampart casing and capping walls
11	605	029, 052, 053, 061, 076	Collapse from stone rampart casing

Building numbers

Building 1 (2.1) 586
 Building 2 (2.2) 584
 Building 3 (2.5) 587
 Building 4 (2.10) 588

SITE 69

Context phase list

Phase 1

033, 152, 177, 178, 181–184, 188, 192, 194–196, 200–207, 211–214, 217, 218, 418, 419

Phase 2

006, 150, 161, 172, 179, 208, 215, 309, 327, 328, 358, 365, 361, 367–372, 376, 383, 384

Phase 3

135, 140–143, 151, 155, 158–160, 163, 164, 168–171, 219, 258, 279, 284, 285, 296, 297, 300, 346,
364, 377, 401, 406, 410, 413, 416, 417, 420, 421

Phase 4

138, 139, 153, 154, 156, 281, 284, 287, 291, 295–297, 299, 300, 335, 341, 378, 404, 405

Phase 5

136, 137, 146, 147, 267, 274, 278, 290, 298, 339, 340, 347, 348, 409

Phase 6

027, 110–112, 114–118, 128, 133, 134, 144, 145, 148, 149, 165–167, 173, 174, 180, 191, 193, 197–199,
209, 305, 308, 314, 315, 329, 338, 342, 343, 345, 349, 350, 353–357, 359–363, 369, 373–375, 380,
407

Phase 7

056, 257, 282, 294, 295, 299, 379

Phase 8

041, 042, 044, 060, 081–084, 086, 120–123, 129, 130–132, 273, 283, 286, 304, 306, 310, 351, 352,
381, 382, 386

Phase 9

004, 008, 074, 095, 101–105, 107–113, 119, 250, 253, 256, 259, 263–266, 268, 275, 280, 288, 289,
387, 388, 402, 403, 408, 414, 415

Phase 10

009, 010, 030, 031, 059, 061, 070, 087, 089, 090, 092, 094, 097–100, 106, 119, 125–127, 176, 185, 216, 227, 248, 249, 255, 261, 292, 293, 320, 321, 324, 326, 330–333, 337, 344, 389, 390

Phase 11

023, 024, 028, 029, 039, 040, 045, 046, 050, 051, 054, 055, 057, 058, 066–069, 071–073, 075–079, 085, 088, 096, 186, 187, 189, 190, 208, 225, 226, 228, 231–238, 243–247, 252, 254, 260, 262, 269, 271, 272, 283, 307, 411, 412

Post-Roman Contexts

001–003, 005, 007, 011–022, 025, 026, 032, 035–038, 043, 048, 049, 052, 053, 062–065, 091, 157, 162, 220–224, 229, 230, 239–242, 251, 270, 301–303, 311–313, 316–319, 322, 323, 325, 333, 336, 366, 385

Geological Substrate

175

'Cleaning Contexts'/Unstratified

034, 047, 080, 124, 210,

Unused Contexts

276, 277, 391–400

Group numbers

<i>Phase</i>	<i>Context (Group No.)</i>	<i>Contexts</i>	<i>Function/Identity</i>
1	419	178, 181, 183, 188, 196, 211–214	Fills of Marking-out Features 418
2–6	376	118, 128, 136, 142, 143–145, 150, 151, 160, 161, 171, 172, 179, 219	<i>Via sagularis</i> of Fort I
2–6	383	267, 274, 278, 281, 284, 287, 290, 401 401, 409, 416	<i>Via quintana</i>
2–6	384	116, 144, 146, 153, 154, 156, 168, 169 421	Layers filling depression/ drain to the rear of the rampart
3	420	141, 158, 159, 219	Dumps between primary <i>via sagularis</i> surface and first re-surfacing
3–6	377	163, 164, 346, 364	Primary ditch fills
5–6	378	329, 339, 347, 348	Recut primary ditch fills
6	380	193, 197–199, 209 354, 356, 357	Layers filling gap between stone wall and cut-back rampart
6	027/305	165–167, 173, 180, 191, 314, 315, 338 359, 361–363, 373	Stone rampart revetment wall

7	379	056, 257, 282, 294 295, 299	Abandonment\levelling deposits separating Fort I and Fort II deposits
8	381	041, 042, 060, 130–132, 304	Layers filling modified front rampart face in Fort IIa
8	082	081, 083, 084, 086	Palisade post-holes
8	386	044, 121, 122	Palisade post-hole fills
8–10	379	185, 216, 321, 326, 330, 343, 344	Secondary ditch fills
9–11	004	059, 061, 070, 074, 075	<i>Via sagularis</i> in Fort II
9–11	382	250, 259, 263–266, 268, 280	North–south road in Fort II
9	388	103, 105, 109, 256, 402, 414	Building 2.11 foundation trench fills
10	390	009, 010, 089, 097, 100	Building 2.12 foundation trench fills
11	051	028, 045, 046, 050	Fort IIb rampart casing
11	024\225	054, 057, 058, 067–069, 072, 236, 237, 252, 260, 262, 269	Stone drain
12	385	020, 053, 162, 312, 316, 319, 324, 333	Post-abandonment ditch fills

Building numbers

Building 1 (2.6) 417

Building 2 (2.7) 410

Building 3 (2.8) 134

Building 4 (2.11) 107\289

Building 5 (2.12) 098

SITE 66

Context phase list

Phase 1

018, 019, 024, 029, 030

Phase 2

007, 012, 013, 015–017, 020–023, 025–028, 031, 032, 033

Phase 3

008, 010, 011, 014, 034

Phase 4

001–006, 009

Group numbers

<i>Phase</i>	<i>Context</i> (<i>Group No.</i>)	<i>Contexts</i>	<i>Function\Identity</i>
2	033	017, 020–022, 029 030	Layers filling Ditch 019
3	034	008, 010, 011, 014	Layers filling Ditch 015

SITE 54

Context phase list*Phase 1*

034, 047, 053, 057–059, 070, 071, 074, 077, 082–084, 146–151, 154–162, 165, 166, 168–186

Phase 2

018–026, 056, 075, 076, 078, 118, 119, 187, 188

Phase 3

005, 027–029

Phase 4

031–033, 035–039, 079

Phase 5

001, 003, 004, 006–017, 038, 040–042, 049, 054, 055, 061–069, 072

Natural

002, 043, 044–046, 050–051

'Cleaning' Contexts

030, 163, 164

Group numbers

<i>Phase</i>	<i>Context</i> (<i>Group No.</i>)	<i>Contexts</i>	<i>Function\Identity</i>
1	186	047, 146, 147, 150, 154, 155	Layers blocking flue 071
2	187	019\122\056, 024 085	Layers filling central part of fort ditch
2	188	021, 023, 025, 026 075\078, 076	Layers filling fort ditch between edge of cut and line of planked lining.

SITE 57

Context phase list*Phase 1*

313–316, 318, 336, 337, 381, 386, 420, 421, 426, 427, 434, 437, 447, 448, 454, 460, 467, 469–482, 488–490, 492, 507–509, 511–520, 522, 524, 527–542, 555–561, 580

Phase 2

356, 375, 376, 388–393, 395–7, 452, 453, 457, 461–466, 483–486, 491–506, 523, 562, 563

Phase 3

383, 384, 425, 429, 451, 459, 487

Phase 4

308, 309, 311, 317, 319–326, 330–335, 339–343, 359, 360, 377, 378, 382, 387, 402, 410, 411, 415, 418, 419, 422, 423, 428, 430–432, 433, 436, 438–444, 445, 450, 455, 456, 468, 543–545, 564, 565

Phase 5

344–346, 347–349, 351–353, 361, 365–369, 371–374, 379, 380, 394, 403–407, 416, 417, 424, 446, 566, 567, 569

Phase 6

233–5, 247, 284, 299–305, 354, 355, 357, 358, 362, 363, 412

Phase 7

190, 193, 210, 236, 245, 246, 250–283, 288–298, 307, 312

Phase 8

176, 191, 192, 196, 197, 211, 231, 237–241, 248, 286, 287, 398, 408, 409, 413–415, 458, 521, 568, 570

Phase 9

138, 141, 143–148, 152, 156, 159, 160–165, 168, 174, 175, 177–182, 184, 186, 187, 189, 194, 195, 198, 200–209, 212–209, 212–230, 232, 242–244, 249, 285, 306, 364, 370, 385, 399–401, 546, 549, 550, 571–573

Phase 10

015, 028, 047–049, 052, 053, 055, 056, 060, 061, 063, 067–069, 076–078, 082–086, 121, 133, 142, 149–151, 153, 154, 155, 157, 158, 167, 172, 173, 185, 199, 327, 328, 350, 574

Phase 11

021, 057, 062, 066, 119, 120, 122, 127, 129, 130, 134, 136, 137, 140, 329, 575

Phase 12

005, 016–020, 022–025, 029, 030, 033–046, 051, 054, 058, 059, 064, 065, 070–075, 079–081, 087, 090, 102–111, 114–118, 123, 125, 126, 128, 131, 132, 135, 139, 169–171, 576–579

Phase 13

011, 014, 026, 050

Post-Roman Contexts

001–004, 006–010, 012, 013, 031, 032, 088, 091–101, 112, 113, 435, 551

Geological Substrate

338

'Cleaning' Contexts

027, 124, 166, 183, 188, 310, 449, 510, 526

Group Numbers

<i>Phase</i>	<i>Context (Group No.)</i>	<i>Contexts</i>	<i>Function\Identity</i>
1	467	469, 471, 473, 475, 477, 479, 481	Layers filling Stake-hole Group 559
2	524	386, 434, 437, 454, 460, 488–490, 492	Layers forming southern section of rampart
1	561	314, 507–509	Layers filling Post-hole Line 560
2	562	375, 388, 390, 392, 396	Layers filling Pit Group 395
2	563	461, 464, 466	Post-trench fills in Building 2.3
4	565	317–321, 323, 325, 330, 332, 334, 339–342, 359, 450	Layers filling Pit Group 564
5	567	347\379, 348, 351, 352, 365, 368, 371, 372	Layers filling Pit Group 566
6	412	284, 299, 300, 357, 358, 362, 363	Building 2.9 contexts
7	312	190, 245\251, 246 250, 289	Building 2.4 contexts
8	568	192, 237, 286	Layers filling Latrine Structure 239
8	570	176, 398, 408, 409, 414	Layers filling Well 458
9	571	151, 156, 177, 184, 189, 195, 242–244, 249, 286, 306	Layers sealing Building 2.4 demolition debris and underlying western section of rampart
9	201	202–209	Group of post-pads to the rear of western rampart
9	572	182, 186, 385, 399, 400	Layers filling Pit 401
9	162	159, 160, 161, 163–165, 168	Oven\Hearth\Furnace

9	573	141, 143–148, 152, 178–180	Oven\hearth\furnace
10	172	060, 061, 082–084	Building 2.13 contexts
10	574	053, 063\185, 158	Dumps underlying Building 2.13 and adjacent <i>via sagularis</i> surfaces
10	173	028\047, 052\055, 048, 049, 068, 069, 085, 086, 142, 149, 154, 155	Fort IIa <i>via sagularis</i> surface and ‘make-up’
11	575	015, 056\076, 327 328, 350	Layers filling Pit 057\329
11	129	127, 134, 136, 137	Layers filling well-pit slump below corndryer
12	576	090, 117, 118, 132,	Layers filling well-pit slump above corndryer
12	577	033, 035, 037, 039, 041, 045, 064, 070, 073, 104, 107, 110, 115, 125	Packing in Building 2.14 post-pits
12	578	017–020, 022, 023, 030, 072, 079, 087, 106, 109, 114	Post-hole fills in Building 2.14 post-pits

Building numbers

Building 1 (2.3) 525
 Building 2 (2.9) 412
 Building 3 (2.4) 312
 Building 4 (2.13) 172
 Building 5 (2.14) 171

NOTES to Chapter 2

1. The suggestion of an insubstantially founded fort wall is supported by the comparably slight footings at the east end of Site 69.
2. See also the gazetteer for this group pp. 47–53; the dimensions for the spacing and the size of our gateway accord well with the variations recorded there.
3. A steepening in this slope near the back of the rampart was probably the result of subsidence associated with the fill of Pit 567.
4. Building 2.9 must have been demolished as its south post-trench had been cut by the north construction trench of Building 2.4.
5. In the section along the embankment (FIG. 36) 215 and 216 overlay possible demolition deposits (214, 219), which were above the remains of a road (217\221) and other deposits of less certain purpose. At the west end of the section the remains of foundations (225) for a partially robbed (224) stone wall were noted. Although these deposits clearly belonged to the first fort, they were only identified in section and their purpose or function cannot be ascribed other than that the metallated surface (217) was probably a continuation of the *via sagularis*, the course of which was further recorded (547) during the 1989 watching-brief.
6. It is probable that the bulk of the rampart was set behind a road which in the first fort had separated

the *praetentura* from the *latera praetorii*. The west edge of this thoroughfare was identified in the 4 Dock Street part of Site 53 where it certainly defined the eastern limit of Building 3.12 and probably that of Building 3.10; here this surface was cut by a ditch running along the south side of the reduced fort. Observations in 1989 suggested that the west rampart of the fort wall was largely set on this surface.

7. If these had landed further downstream, then the only access to the fort would have been across the marshes of the River Lliw or a long inland detour. A landing further upstream would have entailed vessels passing in single file through the narrow river channel below the fort.

CHAPTER THREE

THE INTERNAL BUILDINGS

By A. G. MARVELL

INTRODUCTION

The principal area in which the internal buildings of the fort were examined lay to the rear of Nos 4, 6, and 8 Dock Street and in the adjacent upper gardens of Station House (see FIG. 3); the latter area formed the first phase of excavation between May 1982 and June 1983; this was followed by excavation of the northern half of the gardens of Nos 6 and 8 Dock Street, which was completed in May 1984. This two-stage approach was determined by unforeseen delays in gaining access to the garden of No. 8 Dock Street. The remaining part of those gardens, together with part of the land to the rear of No. 4 Dock Street, was excavated between September 1987 and August 1988.

Initially only those areas directly affected by the first stage of the proposed development scheme were excavated; thus at first the site was delimited to the east by the western curtilage of No. 8 Dock Street and subsequently extended up to the western boundaries of No. 4 Dock Street and No. 77 Castle Street, to the north by the cutting for the Broadoak Colliery Mineral Railway line (disused), to the west and south-west by the substantial terracing in the nineteenth century of the Station House gardens, and to the south by an arbitrary line across the rear gardens of Nos 6 and 8 Dock Street. Advancement of the second stage of the development project initially entailed excavation of the remaining areas of Nos 6 and 8 Dock Street, part of which had been removed in the intervening period. This area was increased in November 1989 to include part of the rear garden of No. 4 Dock Street to accommodate revised road plans. In respect of the suggested outline plan of the fort, the excavation was situated within the north-west angle of the defences.

Within the total area opened out (some 850 m²) a complex and well-preserved sequence of structures was discerned and virtually completely excavated, with the exception of certain features which were only partially recorded owing to time or safety factors. This sequence is divided into nineteen phases of which Phases 1–17 were of Roman origin.

As these remains provided the best evidence for the sequence of occupation in the Flavio-Trajanic fort, the evidence recorded is presented by phase rather than thematically, as is the case with the defences.

The nature of the structures situated in this part of the fort was first determined by trial work undertaken in 1971 and 1973 (Ling & Ling 1979, 13–39), a brief synopsis of which appears in Chapter 1. Despite the limited size and varied depth of the previous excavations, the stratigraphy was recorded in sufficient detail for a reasonable proportion of the layers and features identified by them to be paralleled with those observed by us. For the purposes of consistency within our own site record, their back-filled test sections were renumbered as follows: F = 010, H = 008, and J = 1862\2728 (FIG. 54).

LIMITATIONS TO THE EVIDENCE

Modern intrusions

The Roman deposits were disturbed by a number of substantial modern intrusions (FIG. 54).

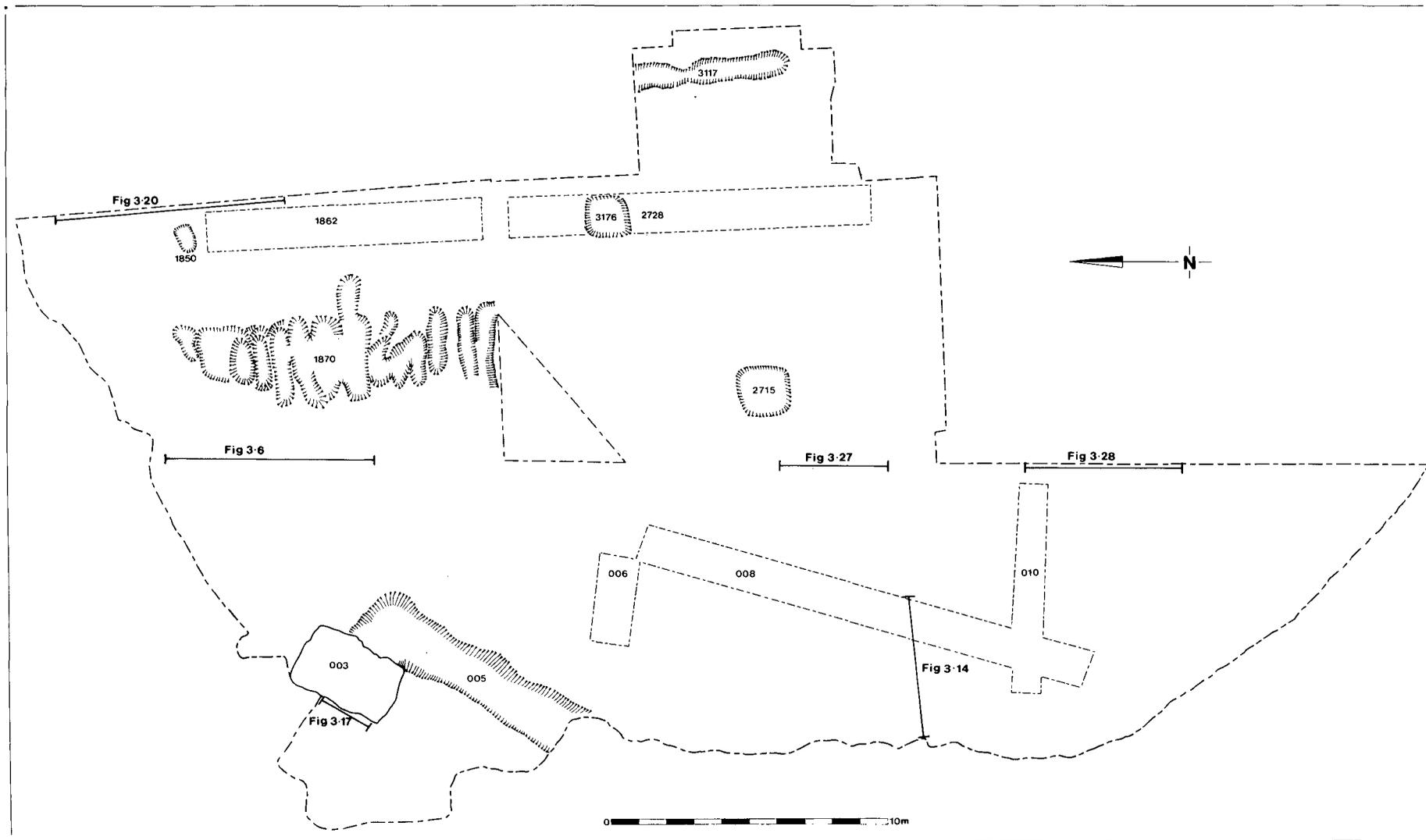


FIG. 54. Location of modern intrusions and sections (Fig. 3.6=Fig. 59, Fig. 3.14=Fig. 67, Fig. 3.17=Fig. 70, Fig. 3.20=Fig. 73, Fig. 3.27=Fig. 80, Fig. 3.28=Fig. 81)

In the north-west corner of the site, a Second World War concrete pillbox (003) and an adjacent dug-out/passageway (005) had been cut down into the natural soils. It was, therefore, difficult to relate the contexts immediately to the south and west of the pillbox with those located in the main part of the site. A second incomplete dug-out¹ (1850, Fill 1849; FIG. 73) was observed in the north-eastern part of the site. A group of parallel cultivation trenches (1870) *c.* 2 m to the west of it had also disturbed the uppermost Roman contexts. In the area to the south and east of these features a Post-Medieval ditch (3117), an earth closet (2715), and a further air-raided shelter (3176) had all truncated the earlier deposits.

Topographic problems

Prior to excavation a marked difference between the ground levels of the Upper Station House and the Nos 6 and 8 Dock Street areas, and between the latter areas and the gardens of No. 4 Dock Street was observed. These differences were due to the existence of post-medieval earthen banks, in origin property boundaries, which reflected the positions of terraces cut into the natural slope during the initial laying-out of the fort in order to create relatively level areas for siting buildings. Even with the terracing, the natural substrate sloped from 13.6 m OD in the south-east angle of the site to 9.56 m OD at the north-western extreme – a gradient of 1:9. Furthermore the layers in the south-eastern extremes of the site had been repeatedly truncated during the Roman period, whereas the depth of surviving deposits increased markedly to the west and to a lesser extent to the north. The surviving depth of the resultant Roman stratigraphy, excluding features cut deeply into the natural, therefore varied from as little as 0.3 m to in excess of 1.2 m. As will be shown, the local topography created problems with the layout and construction of certain buildings; difficulties, which were resolved only by constant levelling and modifications to construction techniques. Since the excavation was undertaken in three stages and, furthermore, because the divisions between some of the areas investigated were along the line of the terraces, it was not always possible to link stratigraphically the contexts from one area to another, although for the most part sufficient evidence had survived for reasonable correlations to be made.

The natural subsoil, here and elsewhere, consisted principally of glacially deposited sands and gravels. In places substantial depressions had formed in the top part of the moraine and these were filled with an alluvial wash of sandy clay which extended over the whole of the site. As there was no trace of any buried turf line, it is suggested that the site may have been completely deturfed and terraced prior to the earliest phase of activity described below.

THE STRUCTURES

PHASE 1 (FIGS 55, 61, 81)

The Phase 1 contexts cut the natural subsoil and were primarily related to the marking-out of the site, we presume after the topsoil had been stripped for use in the construction of the ramparts, prior to the initial phase of internal building in Phase 2.

Marking-out features

The best-preserved of these features was a shallow east-west slot (1787), located *c.* 8 m from the extreme southern end of the site, in which five post-holes were spaced at approximate intervals of 1.8 m. The spaces between the posts were filled with lengths of a grey clay footing (1780; FIG. 81). Four further slots (1537, 2648, 3945, 4003\4007\4011) of similar proportions were found close to the northern and eastern limits of the excavation; but in these examples the size and emplacement of the lines of posts was less uniform, and evidence from their fills (1419, 2632, 3901, 4002\4006\4010) for any supporting footing had not survived. A fifth line of posts (2685), which were not founded in a slot, was located between Contexts 3945 and 4003\4007\4011.

Although the function of these features cannot be identified with any great degree of certainty, it is suggested that the slot-bound posts may have been connected with the marking-out of

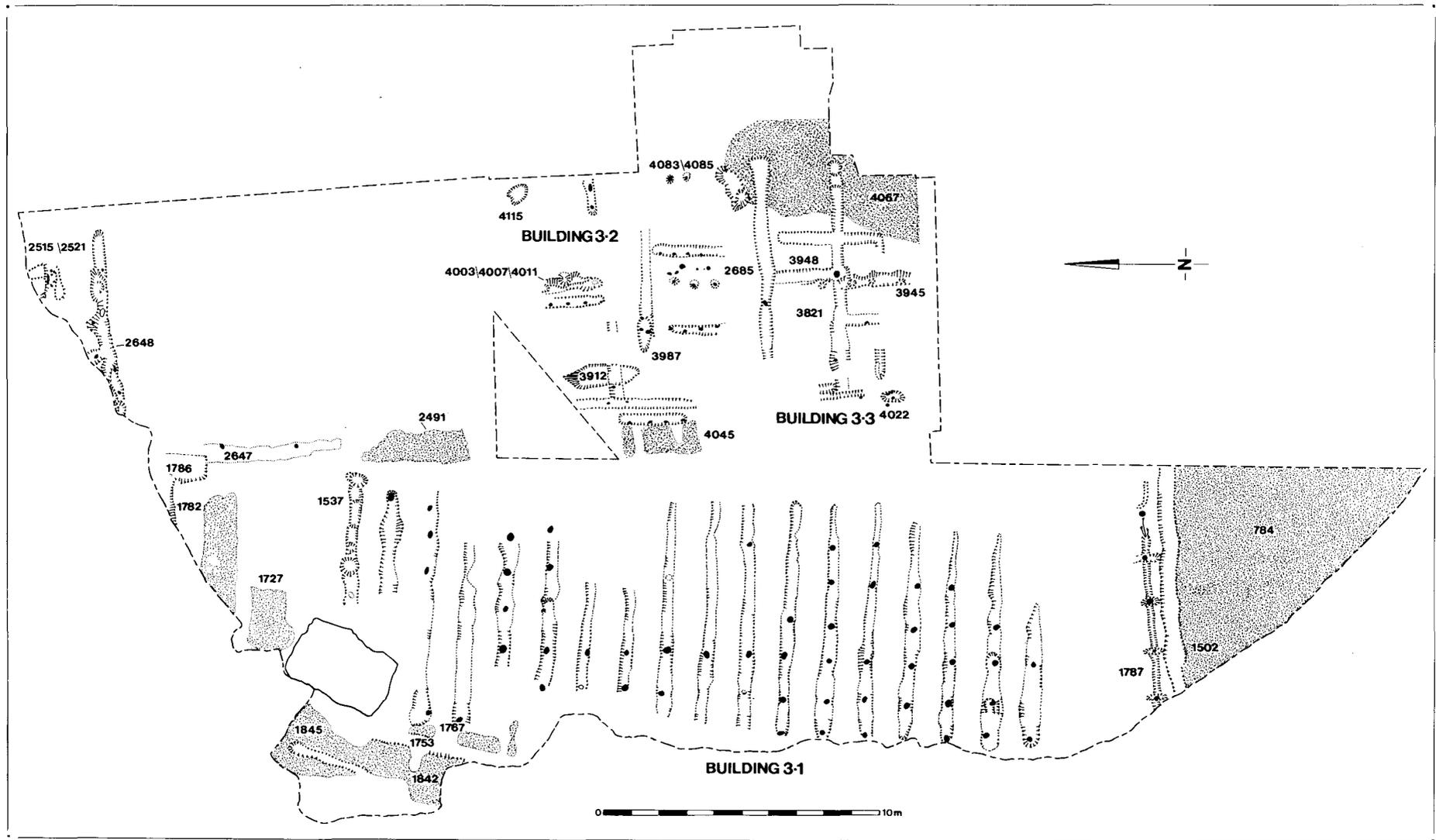


FIG. 55. Site 53: Phases 1 and 2.

principal divisions within the fort. The practices of the Roman surveyors are well attested (Dilke 1962, 170–80). In the case of auxiliary forts the task of laying out the principal divisions would have been undertaken by the *mensores* attached to the legions. Working from a central point they would have laid out two principal lines – the *cardo maximus* and *decumanus maximus* – at right-angles to each other, using a *groma* or cross-staff to achieve this result. Lines were then laid out from these main axes to form the principal divisions within the fort. The various strips of land separated in this way are known as *strigae* or *scamna* depending on their orientation. It is reasonable to suppose that windy conditions or uneven terrain would have created difficulties and compounded the likelihood of errors occurring.

Although it is normally accepted that the divisions were marked out with string lines or, as is shown on the column of Marcus Aurelius, with measuring rods (Dilke 1962, 173), it is apparent that at Loughor lines of posts were left in position by the surveyors prior to arrival of construction work-gangs. This suggestion is reinforced by the fact that some of these lines of posts underlay, or were cut close to, the edge of subsequent road surfaces and also that similar features were located in identical circumstances in other parts of the fort (see Chapter 2). Indeed, it is possible that they served a dual purpose, as, in addition to marking out the road-lines, they could also have supported lengths of timber which, when the roads were laid, would have helped to confine the materials used for this purpose while the matrix binding them together dried out.

However, as will be shown, the position and alignment of some of the subsequent roads and buildings did not always correspond to the position and alignment of the marking-out slots, whilst the misalignment of certain of these features was reflected analogously in the location and positioning of some of the other structures.

Pits 1786, 1782, 3912, 4083\4085, 4115²

Pit 1786 (0.55 m deep) contained seven layers [4177]. Two of these (1760, 1766; FIG. 59) were stained olive-green in colour. The feature had been deliberately capped with clay (1754, 1763) prior to the excavation of a second pit (1782), of which only a limited area was available for examination. It is possible that 1786 had served as a cess-pit, but no traces of an associated latrine were discerned.

The largest of the other pits (3912) contained layers of burnt debris and other degradable matter (3911, 3980), which subsequently compacted causing the post-depositional slumping of the overlying deposits. A copper-alloy *paterna* (Cat. No. 56) was recovered from the uppermost fill. The other pits also contained quantities of burnt debris. The western part of 4083\4085 was roughly circular in shape and had been cut deeper; it may have served as the setting for a post. Two isolated stake-holes were also located in this part of the site.

PHASE 2 (FIGS 55, 56, 59)

Phase 2 was represented principally by the construction of Buildings 3.1, 3.2, and 3.3.³ Several metallised surfaces, two ovens, and some other features of minor importance are also assigned to this stratigraphically related group of contexts.

Building 3.1

Building 3.1 (1709) was a timber-fabricated granary of rectangular plan laid out on a north–south alignment. It was constructed on a base of evenly-spaced circular posts set in parallel trenches cut across the width of the building. The overall dimensions of the structure, calculated on a post-to-post basis, were 23.70 m by 8.80 m (80 pM by 30 pM).

The post-trenches were for the most part 9 m in length; however this dimension cannot be fully substantiated for all examples. They were cut to a depth of 0.50 m (on av.) on the east side of the structure and 0.54 m (on av.) on the west. The sides of all the features sloped inwards so that the width at the base 0.27 m (on av.) was noticeably narrower than that at the top 0.51 m (on av.). The post-trenches were filled with layers of sand and gravel [4178], which was presumably the material originally excavated from them. Although these features had been cut

to a fairly even depth throughout, the natural east-west slope of the gravel spur at this point resulted in an average drop of 0.83 m in the base of each trench – a slope approximately 1:9.

TABLE 1: BUILDING 3.1 RECORDED POST-HOLES BY ROW

Post-Line	Row						
	1	2	3	4	5	6	7 (North)
1473	1442						
1474		1434	1432				1525
1694							1687
1695		1674	1680	1692	1682		
1696		1652	1654	1650	1664	1670	
1697					1648	1672	
1698			1632				1642
1699				1564	1644	1662	
1700							
1482		1273			1620	1624	
1701				1269	1614	1622	1634
1702		1770	1769	1259	1676	1684	1690
1703		1774	1773		1248	1279	1646
1704			1772	1240	1255	1277	1656
1705			1649	1222	1244	1616	1630
1706				1618	1628	1640	1771
1707				1608			1612

(South)

Note 1222=171

TABLE 2: BUILDING 3.1 COMPARATIVE POST-HOLE DIAMETERS

Post-Line	Row						
	1	2	3	4	5	6	7 (North)
1473	0.24						
1474		0.38	0.28				0.12
1694							0.17
1695		0.20	0.23	0.15	0.16		
1696		0.22	0.21	0.13	0.26	0.25	
1697					0.18	0.20	
1698		0.22			0.22		
1699				0.17	0.25	0.22	
1700							
1482		0.19			0.17	0.17	
1701				0.24	0.21	0.16	0.20
1702		0.15	0.15	0.22	0.20	0.16	0.20
1703		0.15	0.15		0.23	0.25	0.26
1704			0.15	0.15	0.22	0.24	0.18
1705			0.20	0.25	0.17	0.18	0.16
1706				0.20	0.21	0.17	0.15
1707					0.23		0.17

(South)

Despite later disturbances it was apparent from the relative positions of the post-holes that each trench contained a line of seven posts (Tables 1 & 2). In each line the posts were set a

notional 1.5 m apart (in actuality varying from 1.48 m to 1.52 m); the same spacing was also observed where posts in adjacent trenches were of the same row. It follows from this that a grid of 119 (maximum) evenly-spaced posts formed the base of the structure. Fifty-six members of this theoretical total were recorded; of these seven were only located after the excavation of the fills of the post-trenches, where their impressions were observed in the bottom of these features. The post-holes measured 0.19 m (on av.) in diameter, but those observed only as impressions



PLATE XIV. Site 53: After excavation of Building 3.1 looking south (2 m scales).

were all 0.15 m in diameter. Several of the posts had been supported additionally by the deliberate positioning of cobbles around them.

The recovered plan of Building 3.1 is similar to that of several other military timber buildings which are normally identified as granaries (Manning 1975, 105–29). It is reasonable to assume that many of the various superstructural elements described in antiquity,⁴ those postulated by Manning (1975, 105–29), and those demonstrated by reconstruction at the ‘Lunt’ fort (Hobley 1982, 263) also occurred in this granary. The grid of evenly-spaced posts would have supported a platform on which the superstructure proper was constructed. This platform is generally believed to have stood *c.* 0.75 m–*c.* 1.00 m above ground level in order to allow air to circulate under the buildings to reduce dampness and to ventilate the grain; as a barrier against vermin entering the building the raised floor was probably less successful. Additional architectural features such as louvred windows and a steeply-pitched roof, presumably here of timber (oak?)⁵ shingles in the absence of evidence for any other suitable material, also assisted in keeping the stored foodstuffs dry and cool.

At Loughor, however, the local topography enforced certain adjustments to the standard arrangements. In particular, it would not have been possible to have the floor on the eastern sides of the structure raised above ground level by more than a few centimetres. This modification would have been dictated by the fall in the ground slope; if the floor of the granary was to be laid level then an excessive gap between ground and floor would have been left on the west side of the structure, unless clearance on the east side was kept to a minimum. It follows, therefore, that the posts for the granary substructure must have been cut to different lengths according to where they were to be placed in each post-trench. Alternatively, and more probably as in the ‘Lunt’ simulation the posts were trimmed off to a universal horizontal level *in situ* (Hobley 1982, pl. 12. 12).

Buildings 3.2 and 3.3

Building 3.2 (2686) was represented by a group of nine truncated post-trenches (eight were recorded in plan), which were 0.42 m (av.) wide and 0.24 m (av.) deep, and two lines of posts supported in pits. Four of the post-trenches were aligned east–west, the others north–south, mainly as a result of later activity none of the features survived to a greater length than 4 m. The east end of one of the post-trenches had also been widened to form a pit (3987) which accommodated three post-settings. Lines of circular posts (av. diameter 0.12 m) were supported in six of the trenches by layers of sand and gravel [4179], presumably the material originally excavated from them. As the layers [4180] filling the other trenches were of identical character, it is reasonable to assume that these features were also constructional elements of the same building. Within the area (*c.* 60 m²) encompassed by Building 3.2, no traces of any floor surfaces were observed.

Building 3.3 (2694) was represented by a series of slots (not all recorded in plan), which were cut to an average width and depth of 0.36 m and 0.15 m respectively. Three of the slots, including the two longest examples which were in excess of 8 m, were aligned east–west, the others north–south. Occasional post-settings were observed in some of the slots and a circular post-pit (4022) was located at the south-west corner of the structure. The slots, and the post-pit, were predominantly filled with grey-brown clay or sandy clay containing appreciable quantities of daub [4181] which was similar in character to material deposited over this part of the site at the start of Phase 5 (see below p. 138), apart from certain of the features in the south–west corner of the building which were filled with a matrix more sandy in texture and pinker in colour [4182]. Within the area (*c.* 43 m²) encompassed by the structure no discernible floor surfaces, except in the eastern part of the building (see below p. 116), were observed. Two of the slots (3821, 3948) cut one of the marking-out features (3945) ascribed to the previous phase.

As a result of later disturbances, most of the original ground plan of Building 3.2 and part of that of Building 3.3 had not survived. However, on the basis of the position of these later disturbances and the surviving evidence, we have compiled conjectured ground plans for both structures (FIG. 56). It could be argued from their proximity that the foundations are in fact part

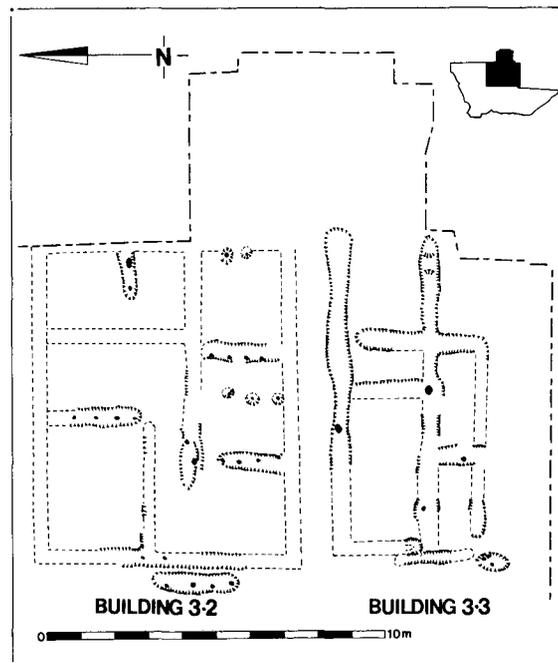


FIG. 56. Site 53: Buildings 3.2 and 3.3 – reconstructed ground plans.

of a single building complex, but the apparently different construction methods suggest to us that this was not the case.

It is also theoretically possible that Buildings 3.1 and 3.2 were neither constructed nor occupied simultaneously. However, the similarities in their alignment, the fact that certain of the construction methods, for example the use of posts set in pits in part of each building, and similarities in plan, for example the deliberate leaving of gaps between the ends of some slots/trenches and the sides of others, would imply that they were part of the same scheme. It should be noted that Buildings 3.2 and 3.3 are on a different alignment to the granary. This variation is connected with the positioning of the marking-out slots previously described. Reference to the plan (FIG. 55) of the earlier features will show that, whereas Buildings 3.2 and 3.3 were offset from Slots 3945 and 4003\4007\4011, which were set at right-angles to Slots 1787 and 2648 (which in turn defined the limits of principal roads within the fort (see below), Building 3.1 had been offset from Slot 1537 which had been laid out some 5 degrees to the north of a parallel alignment. It follows, therefore, from the above and for reasons given below p. 121 that Building 3.1 was erected starting at its northern end as the post-trenches and more significantly the lines of posts are parallel to Slot 1537.

As a result of the truncated plans and lack of internal features the functions of Buildings 3.2 and 3.3 are not easily evaluated. Comparison with other sites (e.g. Fendoch: Richmond & Macintyre 1939, 110–54; Beaufort Red House: Hanson *et al.* 1979, 1–99) suggests that they belong to a miscellanea of structures normally interpreted as being used either for storage or as workshops, although if the reconstructed plan of Building 3.2 is correct, it could have served as an office or as accommodation for specialist troops. It can also be argued that the open-ended arrangements on the east side of Building 3.3 with the accompanying hard-standing served as a storage area for the carts and wagons that would have been required to transport the grain to the granary. However, the answer to which, if any, of these interpretations is correct must remain unresolved.

Roads and hardstanding (FIGS 55, 59, 81)

Traces of four finely-metalled surfaces (784, 1727, 1767\1842, 1520\2491\4045) were discerned on all sides of Building 3.1. Two of these deposits (784, 1520) overlay cobbled make-up layers (212, 1777 respectively).

The road (784) to the south of the granary was particularly substantial; its position in relation to the suggested outline plan of the fort implies that it must be the *via praetoria*. A shallow gully (1502), which cut a dump of gravel (1762) sealing Marking-out Slot 1787 on its north side served as a drain. Observations to the south-east of Site 57 in 1989 identified in an oblique section the probable east drain of this road; if this identification was correct then the *via praetoria* was c. 8 m wide.

The roads to the west (1767\1842) and possibly to the north (1727, which sealed one of the pits (1782) described in Phase 1) of the granary are presumed to be parts of the *via sagularis*. Although in the case of the north section, this would have entailed bringing the road in from the line noted on Castle Street (cf. Chapter 2, *passim*), this deviation was corrected in Phase 3. There was, however, no trace of any buildings in the *intervallum*. Two gullies (1753, 1845) which cut the west section of the *intervallum* road served as drains, the additional example cut perhaps to prevent surplus water collecting to the rear of the rampart.

The road (1520\2491\4045) to the east of the granary served as a passageway between it and Buildings 3.2 and 3.3. It was set on the upper edge of the terrace dividing the Upper Station House and Dock Street parts of the excavation, although part (2491\4045) of this surface was found within the limits of excavations, the rest (1520) was only observed in section.

The slots at the east end of Building 3 were cut through a further area of hardstanding (4046), which overlay a make-up (4048) slightly lighter in colour.

Oven 2515\2521 (FIGS 55, 57)

An oven was constructed above two dumps of ash and charcoal (2457, 2548) which in turn overlay a dump of clay (2611) partially covering Marking-out Trench 2648. It became apparent during the course of excavation that the burnt structure had been rebuilt. The base of this feature consisted of a semicircular layer (2518\2520) of clay set on a partially scorched gravel deposit (2549) which in turn sealed the ash and charcoal layers. A central hollow was lined with yellow-brown clay (2522) which was both compacted and burnt. This structure (2521) measured externally 1.60 m by 1.20 m by 0.25 m and internally 1.40 m by 0.95 m by 0.70 m; the north side had been left open. The replacement feature (2515) utilised the same base and was also semicircular in shape, but with the open side on this occasion to the west. The earlier structure was filled with its own demolished superstructure (2519), the central part of which had been removed; the remaining material was covered with grey clay (2516), in places burnt orange, which formed the lining of the later structure. A thin layer of burning (2517) was recorded in the base of the second feature, which measured 1.65 m by 1.10 m by 0.25 m externally and 0.50 m by 0.30 m by 0.21 m internally.

The function of the oven(s) is unknown, but their location close to the *intervallum* might

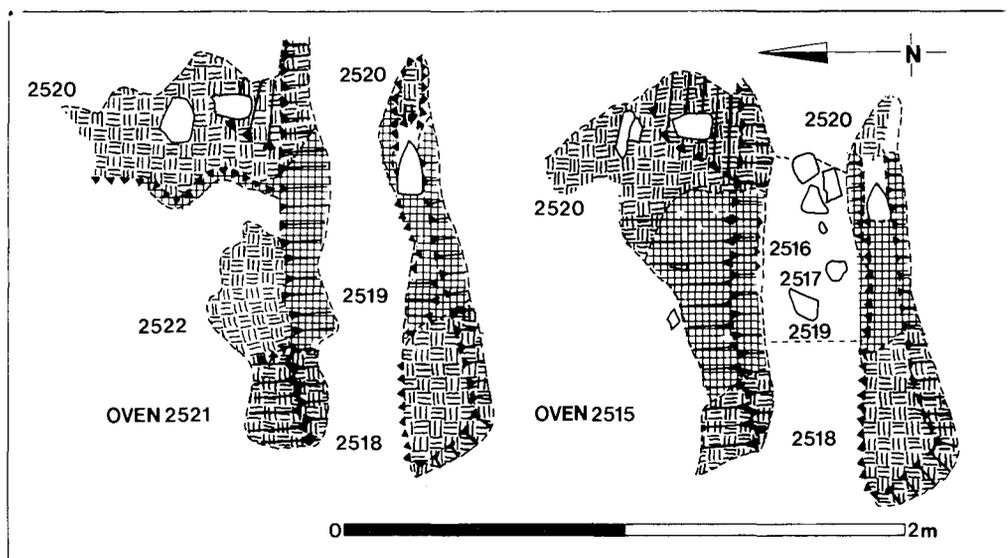


FIG. 57. Site 53: Ovens 2515/2521.

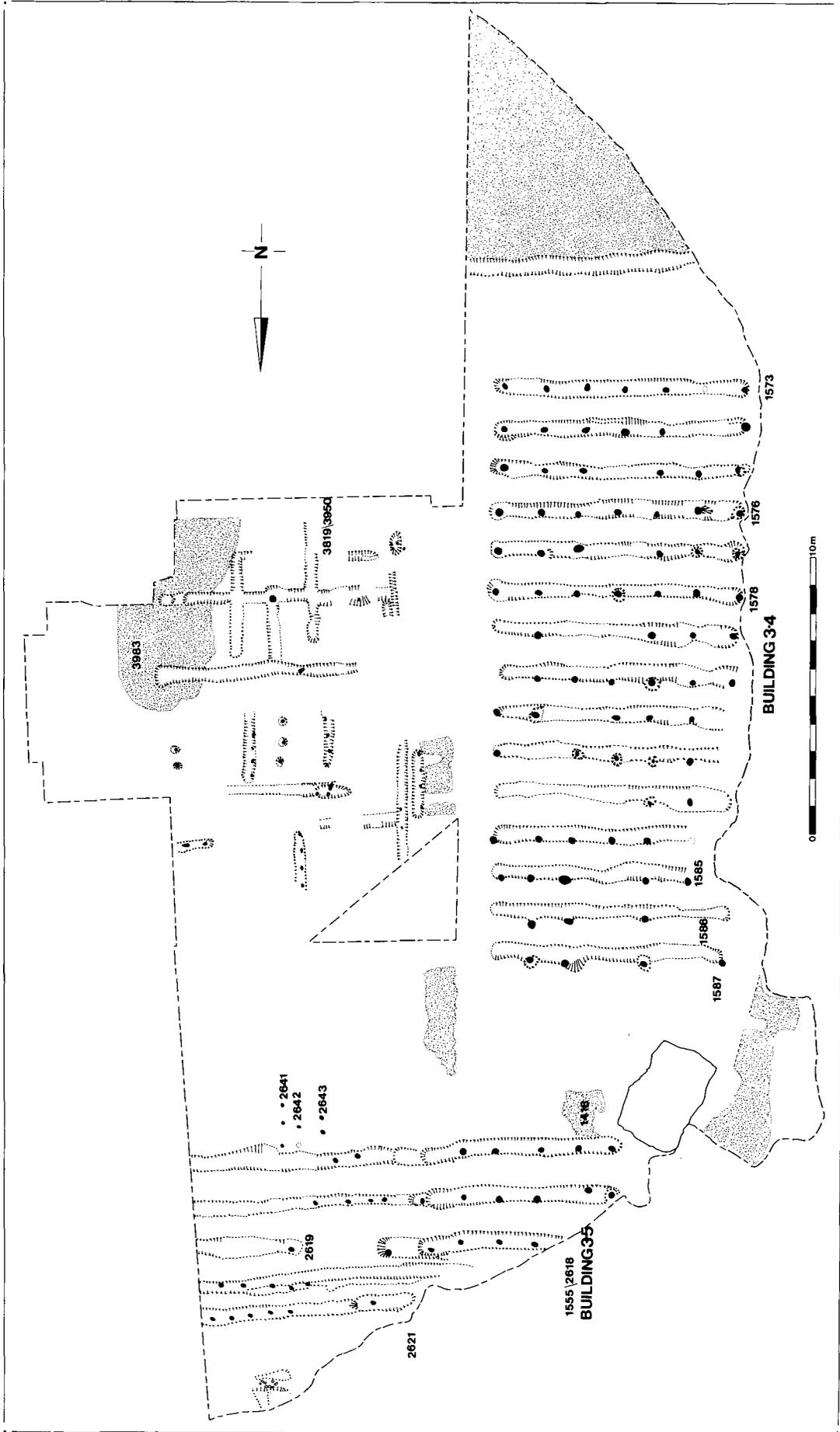


FIG. 58. Site 53: Phase 3.

indicate culinary use, although in form they are dissimilar to the circular ovens often found against the back of fort ramparts.

Post-trench 2647

Part of a post-trench (2647) was located parallel to and alongside the eastern edge of the terrace. The partly-excavated feature contained at least two circular posts. It was apparent from a sectional view (where it had been cut away by one of the post-trenches of Building 3.5) that it had been cut through the possible cess-pit filled in Phase 1.

PHASE 3 (FIG. 58)

The granary described in Phase 2 was demolished and replaced by two new structures (Buildings 3.4 and 3.5). Building 3.2, if not constructed in this phase, may have continued in use; Building 3.3 was modified and the roads resurfaced. On stratigraphical grounds it is not possible to prove whether the ovens were in use in this phase, or indeed whether the replacement of the earlier feature (2521) with 2515 in fact occurred in this phase. Although either eventuality is possible, one argument against their continued use is their proximity to Building 3.5 and the associated risk of fire.

Building 3.3

One of the internal foundation features was replaced by a new slot (3819\3950). The purpose of the further subdivision of the north-western part of Building 3.3 is unknown. Slot 3819\3950 was similar to those forming the other principal foundation components of the structure. It is possible that it was in fact an integral part of the original plan and replaced either an earlier feature of unknown purpose or a misaligned construction trench.

In the absence of any discernible demolition debris it is probable that Buildings 3.2 and 3.3 were deliberately dismantled. In particular, the basal beams of Building 3.3 were apparently removed as the slots were filled with clay deposited as part of levelling material laid down at the start of Phase 5.

Building 3.4

Building 3.4, a granary, was located in the central part of the Upper Station House area, where it was offset from Building 3.1 by *c.* 15 degrees, a fact which had precluded the comprehensive recording of the earlier structure. Although partly truncated by later disturbances, the recovered plan of this structure was more complete than that of its predecessor. Fifteen parallel east-west post-trenches were cut across the width of the building. Each of these features measured 9.60 m (max) in length; they had been cut to an average depth of 0.59 m on the east side of the structure and 0.02 m deeper than this on the other side. The post-trenches all sloped inwards so that the width at the base of each feature 0.27 m (on av.) was significantly less than that at the top 0.53 m (on av.). Although they were cut to a relatively even depth throughout, the natural slope resulted in a drop in actual east-west level at the base of each trench of 1.02 m – approximately a 1:9 slope.

Lines of circular posts were positioned in each trench (a maximum of seven posts was observed in three features (1573, 1576, 1578)) and supported in place by material [4183] originally excavated from the trenches and subsequently redeposited. Traces of silting were noted on the base and sides of some of the trenches. Some of the posts were additionally supported by the deliberate positioning of cobbles around them. The posts, whether in line or row, were spaced (from centre to centre) *c.* 1.50 m apart (\pm 0.03 m deviation). It can be inferred from this that a grid of one hundred and five evenly-spaced posts originally formed the base of the structure; seventy-nine members of this hypothetical total were identified. Although the post-holes measured 0.14 m–0.45 m in diameter, the majority were in the range 0.18 m–0.28 m with an average of 0.24 m. It was apparent that the posts had been set in the centre of the trenches at the south end of the building, but as the rows of posts progressed northwards the individual members were placed on the northern side of each trench. The three northernmost trenches

(1585, 1586, 1587) had been widened deliberately to accommodate the lines of posts. The overall basal dimensions of the structure (measured from post to post) were 9.20 m by 20.75 m (31 pM by 70 pM).

TABLE 3: BUILDING 3.4: RECORDED POST-HOLES BY ROW

Post-Line	Row						
	1	2	3	4	5	6	7
1475		1173	1430		1444		1458
1476		1407	1425		1436		
1477	1570	1378	1409		1438	1447	
1478	1364	1368	1382	1423	1421	1468	
1479					1403	1449	
1480	1516		1466	1460	1405	1452	
1481	1514	1291		1454	1318	1330	
1711		1547	1550	1293	1305	1328	1336
1483		1313			1295	1316	1326
1484	1512	1211	1236	1246	1285	1303	1324
1485	1510	1194	1215		1238	1283	1314
1486	1508	1200	813	990	1253	1281	1312
1487	1505	1190	811		1242	1301	1310
1488	1506	790	798	808	1264		1275
1489	1184	1204	1217	983	1234	1844	1251

(South)

TABLE 4: BUILDING 3.4: COMPARATIVE POST-HOLE DIAMETERS

Post-Line	Row						
	1	2	3	4	5	6	7
1475		0.30	0.18		0.35		0.21
1476		0.30	0.23		0.24		
1477	0.14	0.27	0.25	0.20	0.25		
1478	0.25	0.23	0.24	0.35	0.24	0.28	
1479				0.40	0.21		
1480	0.28		0.41	0.41	0.38	0.31	
1481	0.22	0.38		0.37	0.20	0.16	
1711		0.16	0.16	0.14	0.20	0.24	0.27
1483		0.25			0.27	0.18	0.24
1484	0.28	0.26	0.19	0.23	0.21	0.21	0.29
1485	0.25	0.20	0.20		0.24	0.26	0.45
1486	0.21	0.25	0.21	0.19	0.21	0.18	0.38
1487	0.22	0.24	0.20		0.20	0.20	0.35
1488	0.22	0.18	0.20	0.19	0.19		0.25
1489	0.25	0.19	0.20	0.20	0.24	0.24	0.30

(South)

The recovered plan of Building 3.4 was similar to that of its predecessor, which it would have mirrored in terms of construction, technique, and function. Although the individual post-trenches were *c.* 0.6 m longer and cut slightly more deeply than those of Building 3.1, which was *c.* 3 m longer overall than this granary, the same topographical considerations

would have resulted in similar superstructural arrangements. However, a number of points of structural interest are raised by the positioning of the building and some of its foundation components.

The misalignment (in terms of orientation in respect of the principal axes of the fort) of Building 3.1 was corrected; presumably by marking out the positions of the post-trenches using the *via praetoria* as a base line. However, it was apparent, as the three northernmost trenches (1585, 1586, 1587) had been widened deliberately to accommodate the posts, and as the rows of posts were offset from a true right-angle to the trenches by a few degrees, that other surveying errors had occurred. This evidence has particular relevance to the methods employed and materials used in the construction of these building types.

It is apparent from the misalignment of the rows of posts and the widening of the trenches at the north end of the building that all of the trenches had been excavated in advance of the insertion of the posts – indeed this is implicit from the presence of traces of silting on the sides and bottoms of some of the trenches. This argues against Manning's suggestion (1975, 106) that the trenches were excavated, the posts emplaced, and the soil backfilled on an individual basis. As he rightly points out, this would have prevented the adjustment of posts in those trenches. In the example of Building 3.4, however, the southernmost post-trenches must have been filled first as the post-lines in them are set correctly. If the trenches had been excavated on a one-by-one basis, then those at the northern end of the structure could have been dug taking account of any accumulated errors, rather than, as here, having to be widened so that the posts retained in them could be correctly spaced. The alteration to the foundation trenches at the north end of Building 3.4 also has some bearing on the argument as to whether the posts were free-standing in the trenches or morticed to a base-plate as suggested by Richmond and Macintyre (1939), or rather on the more recent evidence from Valkenburg ZH, free-standing above a base-plate (Groenman-van Waateringe 1990, 403). In the case of Building 2.3, whether a base-plate was used or not (and in places the peri-glacial gravels may have provided a solid enough foundation in their own right) it was clearly not a significant construction element as the widening of the trenches at the north end was such that it could only have accommodated the posts and not a base-plate along the length of the trench.

The argument (Manning 1975, 106) that the trenches were individually excavated because the gap between them was too narrow to have carried the dumped soil can be discounted as the soil could have been deposited at either end of each trench or placed in baskets similar to those depicted on Trajan's Column and used to carry turf (Richmond 1982, 21–5, pls 5–7). The gap between the post-trenches would have been adequate for spoil to be moved thus, as well as allowing working-space during the construction of the raised platform. The presence of a number of isolated stake-holes (not illustrated) within the confines of Building 3.4 prompts the suggestion that these may represent either temporary props during construction or additional floor supports inserted while the granary was in use.

Even though some literary evidence⁶ may imply the stockpiling and seasoning of timber, the case for pre-fabrication in Roman military structures has largely been based on consistencies in the plans of excavated timber buildings (Richmond and Macintyre 1939, 151). It has been suggested both that this evidence is an insufficient basis for argument and, furthermore, that the availability of local timber and the inconsistencies in post size and spacing in many military buildings would appear to imply *ad hoc* arrangements (Hanson 1978, 295–302). In the case of Building 3.4 the archaeological evidence might be taken to support the suggestion that certain of the components of the structure arrived on site in pre-cut lengths, as it could be argued from the widening of the trenches at the north end of the building that the lengths of timber used in the construction of the granary are unlikely to have been cut on site, as, if this was the case, the materials could have been trimmed to fit the spacing of the trenches. Although it is arguably easier to alter the trenches rather than trim the timbers whether cut on site or not, as far as this type of building is concerned, it would not be possible to trim or alter the superstructural timbers in any way in order to compensate for the misalignment of the rows of base-posts without weakening the superstructure or changing substantially internal arrangements such as the position of doors, loading-bays, windows, and bins. However, although this type of building

c. 6 m to north of Building 3.4. These features measured *c.* 0.52 m (on av.) in width, and on the eastern side of the building had vertical sides cut to a depth of 0.26 m (on av.) – with a single exception (2621) which was 0.63 m deep. However, as the structure had been laid out across the terrace, it was necessary to cut steps in the western half of the foundation trenches to compensate for the slope. Even allowing for this the post-trenches at the western end of the building were considerably deeper (0.86 m on av.). The three southernmost trenches were spaced *c.* 0.5 m further apart than those in the northern part of the structure and the central trench was divided into two separate features (1555\2618 and 2619).

Differences were also observed in the relative size and spacing of the circular post-holes in the ‘upper’ and ‘lower’ parts of the building. The individual members of the post-lines in the western part measured 0.21 m (on av.) in diameter, whilst those contexts which formed the lines of posts to the east of the terrace averaged 0.13 m in diameter. It might be presumed from the variations in Building 3.5, that the ‘lower’ part in fact represented a separate and possibly later construction; however, the layers [4184; see FIGS 59 & 73 for 1266, 1296, 1297, 2530–2532, 2567, 2594] filling the post-trenches on either side of the terrace (these were excavated separately) were either identical or sufficiently similar for the possibility of recutting to be discounted. It can be stated, therefore, that the overall width of the structure was *c.* 6.0 m, whilst the minimum length was 16.50 m.

Three further post-trenches (not illustrated), all aligned north–south were discerned in the eastern part of the site, where they joined at right-angles the southernmost post-trench of Building 3.5. Although these features were only partially excavated, it was possible to record an approximate average width and length of 0.40 m by *c.* 2.0 m. Lines (2641–2643) of two or three circular posts (measuring 0.12 m on average in diameter) were supported in each of the post-trenches by layers [4185] consisting of material excavated from and then redeposited in the trenches. The post-lines were spaced centre to centre 0.70 m apart and the post-holes within each line likewise spaced *c.* 0.8 m apart.

Despite the fact that the full extent of Building 3.5 was not found within the limits of the excavation, it is clear from the basis of the recovered plan that this structure was a granary. The granary was probably delimited to the east by one of the principal fort roads (see below p. 174); if so then a building measuring 6 m by *c.* 20.5 m (*c.* 20 pM by 70 pM) is implied. Certain aspects of the recorded plan, and the construction techniques which this implies, are unusual. However, it should be noted that the arrangement of the post-trenches along the longitudinal axis of the building is neither uncommon (e.g. Richborough – Cunliffe 1968, 6–14; Fishbourne – Cunliffe 1971, 39–41) nor significant, as it is the grid of posts that is important.⁷ Reasons of space probably dictated the east–west alignment of the granary since the position of the northern defences would have precluded the erection of a second north–south oriented structure.

The step down in the post-trenches was dictated by the slope of the ground and the terracing, otherwise the floor at the west end of this granary would have been raised to a structurally unacceptable height above the ground. A split-level building is therefore implied, with a lower area *c.* 7 m by 6 m at the west end. Variations in the relative size, spacing, and dimensions of the recorded features were noted in both sections of the granary. Whereas the recorded structural elements of the ‘lower’ part were similar to those identified in Building 3.4, the posts and trenches in the ‘upper’ part were noticeably smaller and shallower as well as being positioned more closely together. No traces of the burnt seed and demolition debris located throughout the Upper Station House area (below p. 124) was observed in association with the ‘upper’ part of Building 3.5 (although the demolition debris could have been ‘swept’ down the slope), nor were any particles of carbonised grain found in any of the post-holes, in contrast to those found in a number of these features to the west of the terrace. It may be concluded from this and, more significantly, from the relative structural weakness of the eastern part of Building 3.5, that the ‘upper’ part of the structure was not necessarily utilised for the storage of grain. It is generally held that structures of this type were mainly utilised for the storage of grain, particularly as charred wheat and other cereals have been recovered from their stone counterparts (Gentry 1976, 27).⁸ However, there is no valid reason why other foodstuffs and supplies could not have been stored in the granaries

(Johnson 1983 a, 157) and it is well attested that the Roman military diet (Davies 1971, 122–42) was far more diverse than the simple foodstuffs recorded by Vegetius.⁹ Fodder for horses was also required and on one of the Vindolanda tablets the most commonly mentioned commodity is *hordeum*, normally only issued to the men as a punishment ration or when other supplies were exhausted (Bowman 1974, 366–7). Barley was not the only livestock fodder as several papyri (Fink 1971, nos 68, 69, 76, 80) demonstrate the receipt of hay (*faenaria*) either by individual soldiers or on behalf of whole units. The bipartite nature of Building 3.5 may reflect a deliberate design with the heavier wheat and barley stored in the stronger western part, whilst lighter supplies were kept in the upper area. Further consideration is given to the problems of storing supplies in a later section.

A final point of structural interest was raised by the identification of three trenches set at right-angles to the south side of the granary. Although not fully excavated, they were undoubtedly an integral part of Building 3.5. It is suggested that they represent the position of an external loading platform. Access to the granary probably determined the position of this feature, as the west end and north side of the structure lay close to the assumed new line of the *via sagularis*. The provision of a side-on loading platform may have been a deliberate step in order to avoid congestion on the *intervallum* road. Entrances were probably situated in the north and south sides of Buildings 3.1 and 3.4, and the accompanying loading bays incorporated into the main part of the structure as no evidence for separate structures was discerned.

Roads and hardstanding

The function of the roads to the south, east, and west of Building 3.1 remained unaltered. The northern section of the *via sagularis* in Phase 2 was mostly blocked by the construction of Building 3.5, although part of it may have continued to be used on the north side of the granary. If so, it would have respected the alignment of the *via sagularis* established on Castle Street (see Chapter 2 *passim*), but this could not be proved within the area available for excavation. Part of a surface (1418) separating this structure from Building 3.4 had survived and it is reasonable to assume that this continued eastwards and westwards thereby linking the west section of the *via sagularis*, which was resurfaced (1688\1841, FIG. 70), with the interval road separating Buildings 3.2, 3.3, and 3.4. Part of this road was resurfaced (3896) and continued beyond the line of 1418 in order to provide access to the loading bay on the south side of Building 3.5. The drains cut into the earlier western section of the *via sagularis* had become disused. The area of hardstanding (4046) to the south-east of Building 3.3 was resurfaced (3983). The *via praetoria* drain may have been filled in (1440) at the end of this phase although it is possible that this feature remained open until Phase 8.

Buildings 3.2–3.5 demolition method

Evidence for the method of demolition employed in the destruction of the granaries was equivocal. Although large quantities of burnt material (585\786\2490, 1139\1728; see FIGS 67, 70 for 786) containing carbonised grain (see below p. 125) were located in the Upper Station House area (the deposits increasing in depth the more westerly their location), these deposits may have included material swept down from the higher areas to the east. However it was apparent that Building 3.3, and presumably Building 3.2, had been completely dismantled. Of particular note is the fact that some of the posts of Building 3.4 had been left *in situ* as it was necessary to dig scoops around them in order to facilitate their extraction. As these scoops cut through the burnt debris, it could be argued that the basal posts had been left in position after the partial demolition of the building and had then been fired but that some examples were not completely destroyed and had to be extracted. It is, therefore, difficult to conclude that there is sufficient evidence to suggest wholesale destruction of these buildings by fire. On the basis of the available evidence, a scenario in which the majority of the superstructure was dismantled prior to the burning of the remnants is the most likely. Indeed, it could be surmised that the

easiest way of removing the platform would have been to light fires underneath it with the consequence that many of the basal posts would survive in a charred condition, as the fire would not necessarily penetrate deeply into the post-settings. If our hypothesis is correct, then the charred grain would have derived from sweepings left at the bottom of the storage containers.

REPORT ON THE BURNT GRAIN by Frances Probert¹⁰

Introduction

The seed samples examined for this report were recovered from a residue of burnt material deposited over the remains of two timber constructed granaries (Buildings 3.4 and 3.5). It is most probable for reasons given previously (above p. 124) that the layer containing the carbonised grain had occurred as the result of the firing of the buildings once much of the superstructure had been removed. The recovered material may therefore represent dislocated 'sweepings' left behind after the unloading of the building prior to demolition rather than a deposit destroyed and preserved *in situ*. Although it is possible that some of the remains could have been swept downslope, it has been suggested (above p. 123) that the eastern and 'upper' part of Building 3.5 may have been used to store fodder and/or other goods rather than grain.

The layers (585\786\2490, 1139\1728) containing the carbonised grain were systematically sampled by the following method. Utilising the existing site grid (accordingly the sample numbers given below and on the accompanying figures refer to the south-west point of each metre grid square with the eastings given first), the layers containing the seed were removed *in tota* from 1 metre squares. This material was then floated on site using the Trust's flotation machine, which was constructed from a design recommended by Dr Gordan Hillman. The total sample from each 1 metre square was measured before flotation and the flot collected in 1mm and 0.25 mm sieves. The residue from the settling tanks and bubble drum was then retained as a control sample.

By examining the carbonised remains it was hoped to confirm or refute certain of the interpretations relating to the function and internal arrangements of the granaries; to show which species of grain were stored in these granaries and in what proportions; to comment if possible on the state of the stored grain from the presence or absence of chaff (i.e. how well it had been processed or if it had been totally cleaned); and, hopefully, from the species of cultivated plants and their associated weeds to establish whether these crops were locally grown.

Methodology

It was not practically possible to examine every seed collected in every sample from the site. It was therefore necessary to make decisions as to which samples were going to yield the greatest amount of information and how many seeds from each sample should be examined to obtain a reliable estimate of the proportions of different species.

Before deciding which samples to examine under the microscope it was necessary to look briefly at every sample with the naked eye to see whether there were any obvious differences between samples – e.g. in the species present and their relative proportions and also any differences in the weed seeds and the presence of chaff. Every sample was examined in this way and, although the results were inconclusive, they did show that the species present in the greatest numbers to the south of the site was barley (*Hordeum sp*), whereas in most other cases spelt (*Triticum spelta*) was the dominant variety. Bread wheat (*T. aestivum*) and emmer (*T. dicoccum*) were to be found in most samples but in lesser numbers. In some of the samples where spelt was the dominant species there did appear to be more bread wheat present, whilst others contained relatively more barley. There appeared to be very few weed seeds present in any of the samples and chaff was virtually absent, indicating that, prior to storage, the grains were thoroughly cleaned. A preliminary examination of the samples by Annie Milles at University College Cardiff (*ex inf.* A. G. Marvell & H. S. Owen-John) showed, in addition to the spelt and barley, the presence of lentil and hazel-nut shell although they were not readily visible in this examination.

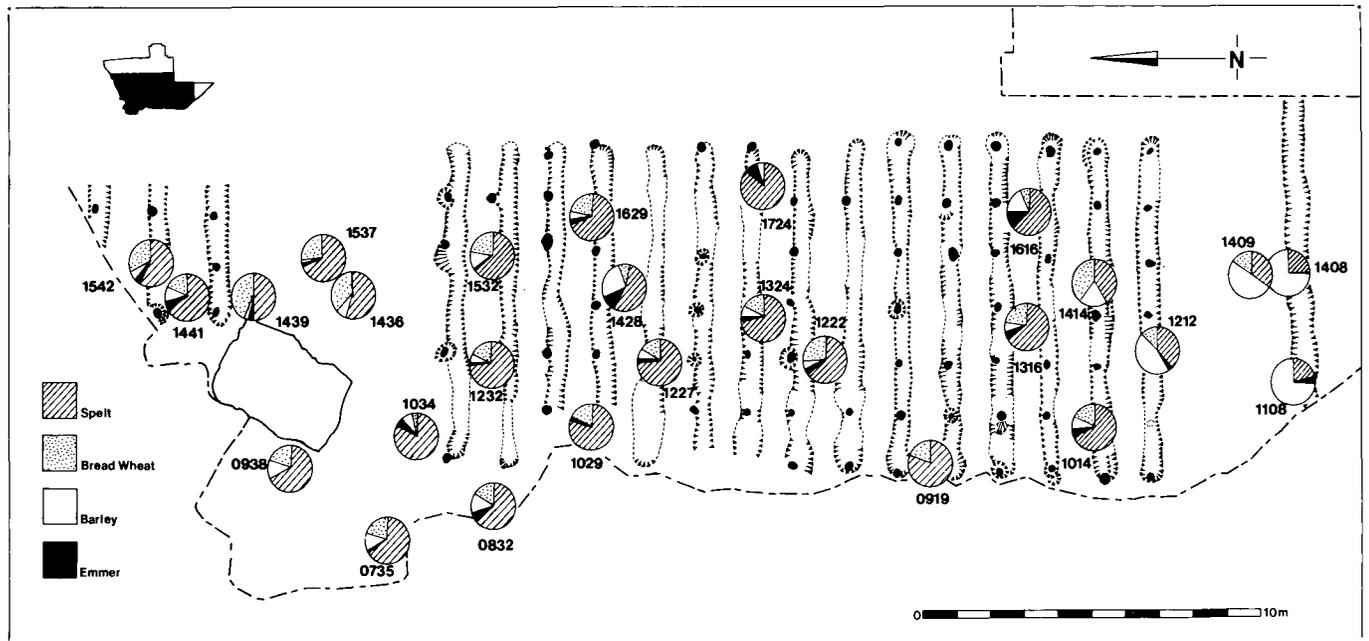


FIG. 60. Site 53: Location of analysed burnt grain samples.

In view of these inconclusive observations it was thought that the best way of obtaining truly representative results was to select samples taken above all the features excavated, covering as much of the area as possible and encompassing any differences noted in the proportions of the species present.

The problem of the number of seeds to examine from each sample was resolved by reference to the results of studies by Van der Veen and Fieller (1982). These have shown that, for a large population, to have a 95 per cent chance of obtaining an accuracy of 2–5 per cent (in absolute terms), it is necessary to identify between 384 and 541 seeds. It was therefore decided to look at approximately 500 seeds for this study and, wherever possible, to keep the sample size approximately constant, in order to eliminate any anomalies.

Samples which were selected for further examination were subsampled using a riffle box, whenever necessary, until the required size was obtained (approximately 500 seeds). In this way it was hoped that, no matter what the original size, the sample would be as unbiased as possible. These samples were then examined under a microscope, usually at a magnification of x8, for identification.

Results (FIG. 60 and TABLE 5)

Wheat and barley are often difficult to identify exactly to species from the grains alone and, although certain grains obviously belong to one species or another, there can be an overlap between, for example, spelt and emmer and spelt and bread wheat. In this report grains which fall into these categories appear in the table but have not been included in any later calculations. With the barley, the state of preservation of most of the grains makes further identification quite difficult. In Sample 1408, however, grains of 6-row hulled barley were definitely present. All of the samples contained hulled barley and, although naked barley might have been present in some of the samples, no positive identifications were made. (Naked barley would have been unusual but is not unheard of on Roman sites (Green 1981).)

The main species found at Loughor were spelt, bread wheat, barley, and emmer. No oats (*Avena sp.*) were found in the samples from Building 3.5 but they were found in small numbers from Building 3.4. Rye (*Secale cereale*), although only present in a couple of samples, was found in both buildings. Neither of these latter species are however present in any quantity.

It can be seen (FIG. 60) that, apart from four samples to the extreme south of the site, virtually all of the samples were dominated by spelt. Bread wheat occurred in varying proportions in all

the samples except 1724, 1108, and 1408. Barley was present in all samples except 0919 and emmer was absent from several samples (e.g. 1408, 1212, 0919, 1436).

Samples 1108 and 1408, which were dominated by barley, were not from the granary buildings themselves but from the fill of the drain (Context 1502) alongside the *via praetoria*. It is possible that these samples could represent spillage from transporting/unloading activities rather than being contemporaneous with the grains found in the adjacent granary. This proposal is supported by the fact that in Sample 1409, which is from the area between the granary and the drain, although barley is still dominant, it is not present in such large proportions as it is in the drain itself. There were also very few grains in the samples between the drain and the first post-trench (1573) which again suggests that Samples 1108, 1408, and 1409 represent a different episode in the history of the site. Sample 1212 taken above Post-trench 1573 was very small and again dominated by barley. It might well have a closer association with the samples from the drain than with the other samples from Building 3.4.

There seems to be very little real difference between the samples from Buildings 3.4 and 3.5, although the ones taken from the area of Building 3.5 contain a higher proportion of charcoal than most of the other samples examined. Bread wheat was generally present in all of the samples from Building 3.5 and in slightly greater numbers than from the rest of the site. However, there does not appear to be a really significant difference between the samples taken from the two granaries and those from the west of the site outside the buildings – i.e. 0735, 0834, 1034, and 0938.

The distribution of weed seeds across the site is also largely undiagnostic. There are slightly fewer weeds in the samples from Building 3.5 and from the drain, but this could be caused solely by the fact that fewer samples were available from these areas. Although the weed seeds found at Loughor are quite consistent with the crops having been grown locally, there is nothing to show that they were not grown further afield: *Vicia/lathyrus* are nitrogen-fixing legumes which would do well in nitrogen-poor soils; *Polygonum lapathifolium/persicaria* are weeds of crops or wet ground; *Bromus secalinus/mollis* are common weeds of crops; *Cyperacae scirpus* (small seeded) is common on wet ground and *Rumex* is a common weed found in most soil types. The few weeds that were found were generally large-seeded and were therefore likely to have slipped through the various crop processing stages. The main conclusion to be drawn from the weed seeds, or rather their general absence, is that grains were stored at Loughor after they had been fully processed and cleaned.

Discussion

Although it is not possible to state positively where the crops stored at Loughor were grown, it is possible to comment on how they were grown and stored, i.e. as separate crops, or whether certain species were contaminants of the main crop. Spelt was present in such quantities that it must have been grown and stored as a main crop. From the evidence of the samples from the area of the granaries alone, barley might have been a contaminant of the spelt crop. However, there is the additional evidence of the samples taken from the *via praetoria* drain and those from the area between the drain and Building 3.4. From these, where it is very obvious that barley was the dominant species, it can be seen that barley was stored separately. If barley was stored separately, even though this may represent a different episode from the rest of the site (see above), it is unlikely that this should have been an exceptional instance and therefore it is reasonable to assume that barley had always been stored separately. Bread wheat was certainly not a contaminant of barley – there are many samples where it (bread wheat) was present in much greater quantities than barley (see FIG. 60). Spelt was always found, and usually as the dominant species, in samples which contained bread wheat but the relatively higher proportion of the latter in the samples from the more northerly granary (Building 3.5) and in one or two other samples, e.g. 1414, does suggest that perhaps, instead of being a contaminant of the spelt crop, bread wheat might have been stored separately. It must however, be stated that it is often difficult to distinguish between bread wheat and spelt and so the varying proportions *could* be due to differences in, for example, preservation. Emmer was present in such small quantities

that there is no reason to suppose it was not a contaminant of another crop in the field. As it was found in at least one sample, 1724, where bread wheat did not occur and in many samples where barley was very sparsely represented, it is most likely that the emmer found here was a contaminant of the spelt crop.

From the above it can be seen that it was unlikely (except in the case of emmer and spelt) that the crops were either grown together or mixed later on in storage. Some mixing together of the stored grain would occur if the containers for the stored grain were burnt but it does seem possible that sweeping out of the buildings prior to destruction could account for much of the mixing.

As Hillman (1981) has pointed out, barley and bread wheat are both free threshing and as such are generally fully processed before the useful portion is stored. Spelt and emmer are both glume wheats (the grains are closely enveloped by thick husks called glumes) and therefore need to be threshed twice in order to be thoroughly cleaned. Glume wheats can be stored after the first threshing as complete spikelets and in this form they are more resistant to the attacks of insects and fungi than is the completely cleaned grain (Hillman 1981). The fact that very little spelt and emmer rachis was found here does suggest that perhaps there was a relatively high turnover of grains – i.e. that they did not need to keep so well.

Results from other Roman sites

The results of the examination of the seeds from the fort at South Shields are not available at the time of writing (Van der Veen, in prep.), but it does appear that the species found there are roughly similar to those from Loughor. Barley is present in slightly fewer numbers but both spelt and bread wheat are present. The main difference is that the crops seem to have been considerably less well cleaned than at Loughor (the weed assemblage is being studied at the moment). However, unlike Loughor, the granary sampled at South Shields was one of twenty-two – the fort acting as a supply base for the Roman army in Scotland (Bidwell 1984). It is evident that a far greater emphasis was placed on bulk storage there, and it is therefore not surprising that there should be differences between the seed assemblages of Loughor and South Shields. Further comparison might be productive.

There are also significant differences between the seeds from the Roman warehouses in Coney Street, York and those from Loughor. Spelt is the dominant species in both instances and barley is present at both sites in roughly similar relative proportions, but the other main crop at Coney Street was rye (*Secale cereale*) not bread wheat which was only found in very small numbers. Weed seeds and chaff were both present at Coney Street in considerably greater numbers than at Loughor, and it was possible to say from this evidence, and from the insect life, that grain found here was not just a result of local cultivation. The grain composition was indeed similar at York and at Caerleon (Kenward and Williams 1979).

Spelt is actually the most common wheat found in Roman Britain and was used for human consumption (Green 1981; Jones 1981). Barley was not, however, usually used by the Romans for human consumption except as food for slaves in times of famine (White 1970, 214) or as punishment rations (Davies 1971, 123).¹¹ Its normal usage was as animal fodder and for brewing. It is noted as being comparatively scarce in Roman charred deposits (Kenward and Williams 1979). In terms of species content, the only really unusual samples at Loughor are therefore 1108, 1408, 1409, and 1212 (those containing high relative proportions of barley).

The seed remains from the Roman fortress at Neuss in Germany can also be compared with those from Loughor. There it can be seen that barley was far more important than any single species of wheat as a crop. Of the wheats, bread and then spelt were the most important, but emmer was far more common at Neuss than on any of the British sites (Knorzer 1970). Pulses were also found there in far greater quantities.

Conclusions

The extremely well-cleaned state of the crops from this site (i.e. the general lack of chaff and especially weed seeds) makes it difficult to answer many questions which could be usefully

TABLE 5: ANALYSIS OF BURNT GRAIN SAMPLES

A)	B)	C)	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)	15)	16)	17)	18)	19)	20)	21)
1212	100	100%	-	-	-	1	-	2	1	3	2	-	-	9	-	1							
1212		cf	-	1	-	-	-	6	-	-	-	-	-	2	-	-							
1532	1000	12.5%	-	-	-	5	-	68	10	19	10	-	-	16	-	39				2			
1532		cf	-	7	-	-	-	85	-	34	-	-	-	10	-	3							
1414	250	100%	-	-	-	-	-	-	-	1	1	-	-	1	-	-							
1414		cf	-	-	-	-	-	2	-	1	-	-	-	-	-	-							
1409	15	100%	-	-	-	-	-	-	-	1	-	-	-	2	-	-							
1409		cf	-	-	-	-	-	2	-	-	-	-	-	1	-	-							
1222	150	100%	-	1	-	6	-	30	4	15	5	-	-	2	-	12							
1222		cf	-	5	-	-	-	51	-	18	-	-	-	5	-	3	1						
1439	19500	3.125%	-	-	-	12	-	59	83	59	35	1	-	2	-	17	1						
1439		cf	-	12	-	-	-	126	37	109	-	-	-	5	-	-	-						
1436	6500	3.125%	-	-	-	3	-	51	-	28	20	-	-	15	4	7	1						
1436		cf	-	2	-	-	-	111	-	75	-	-	-	-	-	-	-						
0938	10000	1.562%	-	-	-	3	-	87	21	17	12	2	2	13	11	40	2			1		1	
0938		cf	-	4	-	-	-	111	-	43	10	-	-	-	11	-	-						
0735	28000	0.39%	1	-	-	1	-	103	29	25	-	-	-	31	4	56	2						
0735		cf	2	4	-	1	-	138	-	50	-	-	-	16	-	5	-						
0832	20000	0.78%	-	3	-	19	1	155	29	35	17	-	-	1	53	3	48	5			1		1
0832		cf	-	25	-	-	-	193	-	59	-	-	-	19	-	7	-						
1029	250	50%	-	-	-	3	-	149	16	25	-	2	-	3	-	15	2						
1029		cf	-	4	-	-	-	105	-	30	-	6	-	3	-	-	-						
1014	9000	3.125%	-	5	-	13	2	125	16	32	20	1	1	1	21	-	14						1
1014		cf	-	17	-	-	-	129	-	35	-	1	-	8	-	2	-						
1316	2500	6.25%	-	5	-	2	-	90	12	28	28	2	-	12	-	15	3	2					1
1316		cf	-	21	-	-	-	131	-	46	-	-	-	5	-	1	-			1			
1324	300	100%	-	-	-	9	-	166	29	29	4	1	-	17	1	26	5	1			2		2
1324		cf	-	9	-	-	-	163	-	42	-	-	-	10	-	-	-			2			
1629	2500	12.5%	-	4	-	22	-	106	10	36	20	-	-	8	-	32	1	1	2				
1629		cf	-	8	-	-	-	202	-	58	-	-	-	10	-	4	-						
1232	1000	50%	-	2	1	-	-	119	20	19	38	1	-	16	2	30	2			1		1	1
1232		cf	-	5	-	-	-	112	-	35	-	7	-	-	-	2	-						
0919	1000	50%	-	-	-	1	-	131	18	24	13	-	-	-	-	17	11			1			
0919		cf	-	1	-	-	-	111	-	34	-	-	-	-	-	-	-						
1408	3500	12.5%	-	-	-	18	-	50	-	22	-	39	26	232	16	99		1					
1408		cf	-	4	-	-	-	57	-	1	-	-	-	-	46	-	-						
1108	7000	12.5%	2	6	-	10	-	57	-	58	1	17	17	302	6	82							
1108		cf	-	24	-	-	-	44	-	-	-	-	-	-	46	-	-						
1724	3000	12.5%	-	6	-	20	-	209	-	53	4	-	-	-	10	22	3						
1724		cf	-	21	-	-	-	9	-	-	5	-	-	-	3	-	-						
1034	500	25%	-	2	-	32	-	228	58	18	17	2	1	6	2	35	2	4			1		2
1034		cf	-	24	-	-	-	98	-	8	-	-	-	-	13	1	-			2			
1227	1000	100%	-	-	-	15	-	90	27	7	1	-	-	10	-	-	2	2		1			3
1227		cf	-	4	1	-	-	29	-	19	-	-	-	-	-	1	-			2			
1616	4000	12.5%	-	13	-	30	-	188	15	7	7	-	-	24	-	36	1						4
1616		cf	-	30	-	-	-	49	-	16	-	-	-	36	11	-	-						
1441	9000	100%	-	2	-	14	-	80	18	5	32	2	-	9	-	55							
1441		cf	-	11	-	-	-	70	-	31	-	-	-	11	-	-	-						
1537	7500	6.25%	-	-	-	11	-	120	54	24	28	-	-	4	-	45				1			
1537		cf	-	7	-	-	-	80	-	48	-	-	-	5	-	-	-						
1542	10000	12.5%	-	1	-	3	-	33	20	4	23	-	-	6	-	14							
1542		cf	-	5	-	-	-	48	-	43	-	-	-	2	-	-	1						
1428	1000	25%	-	1	-	28	-	81	11	1	21	3	7	32	-	61	3	1					1
1428		cf	-	27	-	-	-	76	-	18	-	-	-	25	-	2	-						

Key (TABLE 5): A) Sample number; B) Vol of earth floated (ml); C) Amount of sample examined; 1) T. dicoccum (emmer) Spikelet-forks/glume bases, grains; 2) T. dicoccum/T. spelta (emmer/spelt) Spikelet-forks/ glume bases, grains; 3) T. Spelta (spelt) Spikelet-forks/glume bases, grains; 4) T. Spelta/aestivum (spelt/bread wheat) Grains; 5) T. aestivum (bread wheat) Grains; 6) Triticum indet Grains; 7) Secale cereale (rye) Grains; 8) Avena indet (oats) Grains; 9) Hordeum (barley) Hulled asymmetric grains, Hulled symmetric grains; Hulled grains, Indet grain; 10) Triticum Hordeum grains; 11) Bromus secalinus/mollis; 12) Polygonum lapathifolium/persicaria; 13) Polygonum/cypercae; 14) Cypercae eleocharis sp; 15) Cypercae scirpus sp; 16) Rumex sp; 17) Vicia hirsuta; 18) Vicia/Lathyrus; 19) Ranunculus acris/bulbosus/repens/sardous; 20) Graminae indet; 21) Hazelnut shell.

posed. We have seen that spelt was the most important cultivated species stored in the granaries, as is the case with many other Roman granaries in Britain. Barley was also present as a crop in its own right, as shown by the samples from the south end of the site, but it probably did not play as important a part in the economy as spelt.

It is not really possible to comment on the methods of storage from the assemblage found, other than to say that there was definite evidence for separate storage of at least two of the species found – i.e. spelt and barley – and possibly also bread wheat. The mixing of the grains in the samples may simply be a consequence of the burning of the buildings during demolition; it may represent the result of sweeping prior to the said demolition; or, quite possibly, a combination of the two. The deposition of grain in the roadside drain through accidental spillage seems unlikely, as this material was carbonised, but given the higher quantities of barley present in the adjacent samples from the south end of Building 3.4, does no more than confirm the likelihood of separate crop storage here.

Loughor is slightly unusual as a Roman auxiliary fort in the sense of the lack of weeds and chaff found, otherwise the results inter-site are quite uniform. The only exception is the samples from the drain and these are not, as such, part of the main granary assemblages.

It was not possible to say from the weed seeds found whether the crops were locally grown but equally, there is nothing to say that they were not.

DATING EVIDENCE: PHASES 1–3

Although a relatively high percentage of pre-Flavian coins were recovered from the fort, there are insufficient quantities of pre-Flavian pottery from Site 53 to support a foundation date earlier than 73/4. Two relatively unworn coins (Cat. Nos 25 & 28) of Vespasian dated to 72/3 were recovered from the post-trench fills of Building 3.4 in Phase 3 and a later issue (77/8, Cat. No. 33) was recovered from the part of the deposits containing the carbonised grain sealing the granaries. An early to mid-Flavian date is appropriate for the coarse pottery from this phase and this is not contradicted by the samian, apart from a stamp (Cat. No. 29) from the surface of the *via sagularis* which is unusual, but not without parallels in a Flavian context. The presence of part of a Haltern 70 amphora (No. 4) in the fill (1381) of one of the post-holes of Building 3.4, with adjoining fragments from contexts in Phase 6, is also unusual (see Amphora Report for discussion of this vessel).

A construction date in the 70s for the granaries, which were probably demolished in the early 80s and probably not much later than 85, is therefore suggested.

THE GRANARIES: DISCUSSION (FIGS 61, 62)

Military timber buildings which survive in plan as rows of evenly spaced posts either in trenches or pits or pile-driven are well attested archaeologically and commonly identified as granaries (Manning 1975, 105). The use of sill beams is rare and although suggested at Fendoch (Richmond and Macintyre 1939, 130) the only proven example is at Valkenburg.¹² At Loughor the first of these methods was preferred; the alignment of the trenches is not relevant as both serve to provide a grid of regularly spaced posts on which to support a raised superstructure. Analogies with stone examples (Gentry 1975, 26), the occasional finds of charred grain, and a statement by Pliny¹³ all indicate that these structures were used principally to store grain. However, if these buildings are to be correctly classified as *horrea*, it must be assumed that other supplies were kept in them as well (von Petrikovits 1975, 82–3).

By using the open-plan method of excavation we were able to record fully the surviving elements of Buildings 3.1, 3.4, and almost all of Building 3.5;¹⁴ as a consequence it has proved possible both to demonstrate accurately the sequence of construction and, from variations in the plans, to show the likelihood of certain superstructural arrangements. It follows that if the form of the building can be assessed in detail, then the probable storage arrangements may be suggested; these are discussed in the final part of this section.

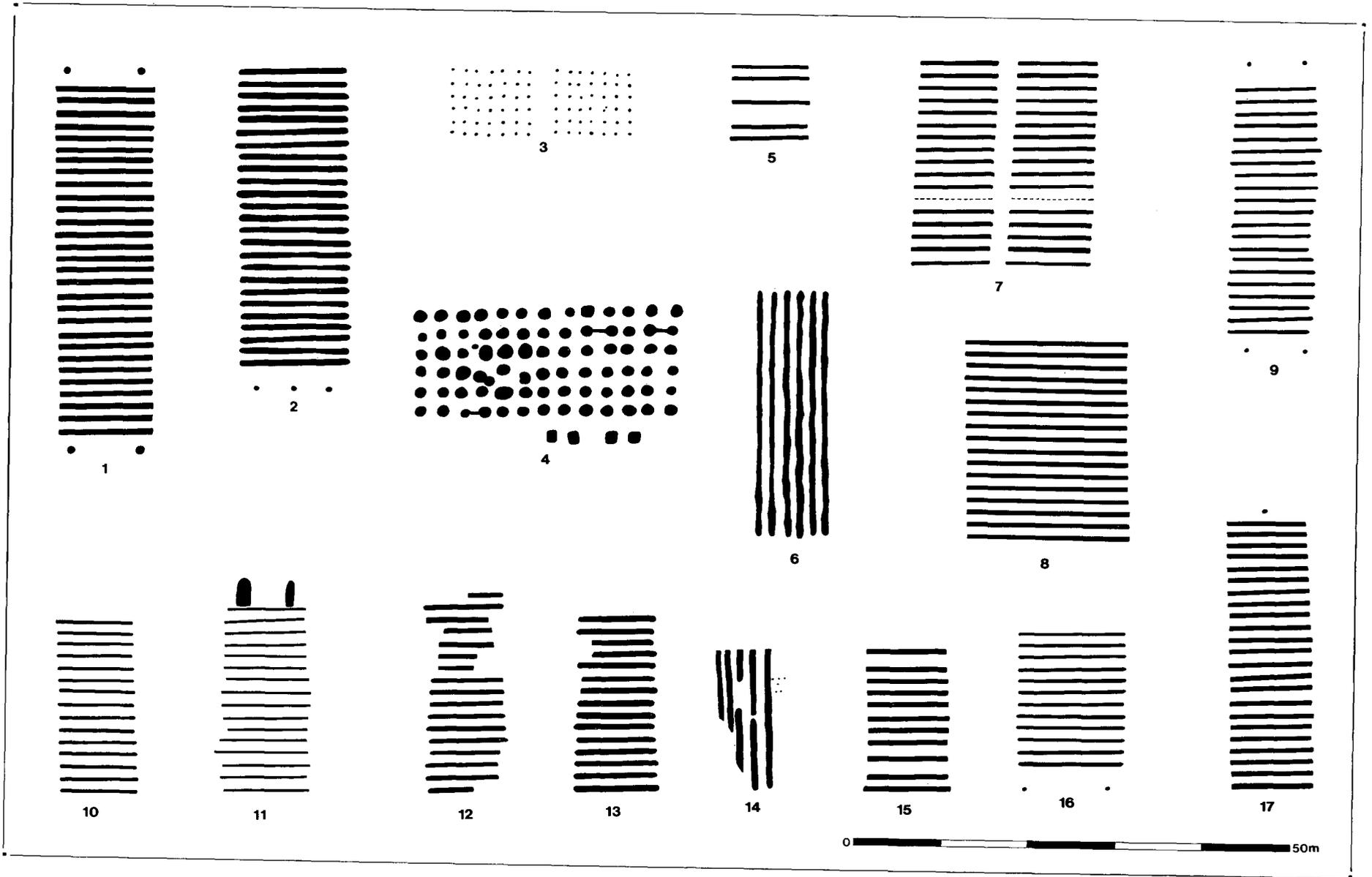


FIG. 61. Site 53: Comparative block plans of timber granaries from legionary fortresses (Nos 1-3), auxiliary forts (Nos 5, 7-15), vexillation forts (Nos 16 and 17), and 'supply bases' (Nos 4 and 6).

Structure

Substructure and Construction

Initially the post-trenches were excavated; these may have been left open for a short time as traces of silting were discerned in certain examples. The grid of evenly spaced basal posts, all of which were circular in cross-section, was then laid out in the trenches. Variations in the spacing of the posts may be explained either by shifts in the actual position of the posts when the granaries were dismantled – in the case of Building 3.4 it was necessary to cut shallow scoops around some of the charred posts in order to extract them – or because the structure was set out using wooden rods which may have been inaccurately laid. On some sites the base posts may have been left to rot *in situ*, whilst at Corbridge the area between them was levelled up with gravel (Gillam and Tait 1971, 16–18).

In Building 3.4 the posts were placed in the southernmost trenches first. Although it was not possible to determine whether all of the posts were positioned before the superstructure was erected or whether construction of the upper part of the building had begun at the southern end whilst the northern trenches were still being filled, the first of these two possibilities is the more likely as it would have been necessary to trim the posts to a level before attaching the joists for the raised platform (see Hobley 1982, pl. 12.12). The widening of the trenches at the north end of Building 3.4 not only suggests that one work-gang had cut the trenches and another erected the granary but also reflects the need to have the posts supporting the ends and presumably the sides of the raised platform correctly spaced. Although this in itself is not sufficient evidence to argue for a pre-fabricated structure (above p. 121).

There was no evidence for a base-plate as suggested by Richmond and Macintyre (1939, 130), and more recently identified at Valkenburg ZH (Groenman-van Waateringe 1990, 403), where the uprights for the basal platform were placed on the base-plate rather than morticed to it. The provision of such a feature makes eminent sense, especially on soft terrain. However, at Loughor the trenches were mainly cut through peri-glacial deposits which may have been firm enough in their own right to prevent the posts from sinking through the bottom of the trenches. As the foundation trenches here followed the natural slope, a base-plate respecting these contours would have probably weakened rather than enhanced the structure, and the uprights would have had to have been morticed to it. That such a feature was not deemed essential can be seen from the alterations to the north end of Building 3.4, where the trenches were widened only at the point where it was necessary to insert the posts on their re-oriented lines; if a base-plate had been an integral feature to the construction then it would have been necessary to widen the whole trench.

Superstructure

The nature and arrangement of the superstructure are largely a matter of conjecture, but certain aspects can be reasonably assumed. Once the posts were trimmed off to a level, the joists for the floor would have been laid. It is possible that squared plates of timber were laid under the joists and over the base posts; a similar arrangement in stone can be seen at Corbridge. This might have deterred rats and mice from entering the building by climbing up the base posts. Alternatively this could have been prevented by using beams in the basal platform that were wider than the underlying posts (Manning 1975, 109). On completion of the raised platform, the principal uprights for the external walls might for convenience have been spaced at intervals of 1.5 m or 3 m so that they could be sited above corresponding members of the basal grid, but there would have been no engineering requirement for this as once the floor joists had been laid over the foundation posts the load and thrust from the uprights would have been spread equally through all the foundation posts, as they were regularly spaced. Furthermore, given the close spacing of the grid of foundation posts the risk of bending in the floor joists is limited. Minor irregularities in the alignment of the lines and rows of base posts as noticed at Richborough and Usk do not therefore have any major effect on the superstructural arrangements. The superstructure could have been tied to a base of sleeper-beams secured to the foundation platform, although this would require the fashioning of additional joints and is therefore an

unnecessary over-complication. There is no need for the circular base posts to have continued as part of the superstructure of the building, and besides this would have created additional difficulties with joints (Manning 1975, 111), all of which here were presumably pegged to judge by the absence of nails.

A variation on these probable arrangements is Granary 2 at Valkenburg ZH (Groenman-van Waateringe 1990, 403–5), where the surviving evidence suggests that the circular base posts supported only the floor, with the floorboards laid perpendicular to the foundation trenches rather than parallel as suggested by Manning (1975, 109–11), and that this was encased by the walls supported on free-standing posts. The normal reason for assuming a raised superstructure as well as raised floor, is that it would be necessary to maximise air circulation beneath the granary in order to keep the grain as dry as possible. An arrangement as suggested for Valkenburg would not necessarily be unsuitable in this respect and might be advantageous, particularly in wet conditions, provided that some airholes were left. Certainly there are numerous examples of stone-built granaries with external walls, incorporating ventilation holes, surrounding the plinths to support a raised floor, and similar arrangements in timber, even if not detected as yet on 'dry' sites, should not be discounted.

Whether the superstructure was pre-fabricated or not, it seems most appropriate to see it arranged in multiples of Roman feet, hence the spacing of the uprights of the external walls probably at intervals of 5 pM or 10 pM. This was first suggested by Richmond and Macintyre (1939, 130–2), but their conjectured superstructural arrangements were somewhat different from ours, and were used in the reconstructed granary at the 'Lunt' (Hobley 1982, 263). The height of the walls would have been determined by the angle of roof pitch needed to prevent water creep. In the simulated granary at the 'Lunt' the roof ridge was 8.53 m (c. 29 pM) above ground level and the walls 3.04 m (c. 10 pM) high (Hobley 1975, 22 and 1982, 263); similar dimensions may be assumed for the Loughor buildings. The actual construction of the roof is a matter of speculation but as well as the determining factors given above, a relatively elaborate arrangement would have been required, so that firstly it could be effectively tied in to the main part of the structure and secondly be thoroughly weather-proofed, particularly as at Loughor the granaries would have been exposed to the south-westerly winds, which sweep up the estuary. An arrangement whereby 'king' posts attached to the tie-beams support the ridge beam, from which the principles run to the wall plates and are further supported by purlins would have been sufficient. Oak or elm shingles are the most likely roofing material,¹⁵ although from Inchtuthil there is some evidence for a tiled roof on at least one of the granaries (Pitts and St Joseph 1985, 121). The walls were either clad or weather-boarded, there was no evidence to suggest that they were of wattle and daub as argued for the granaries at Usk (Manning 1981, 175–6), particularly as the demolition deposits overlying later buildings on the site contained copious quantities of this material, whereas this was noticeably absent in that above the granaries. Other architectural features may have included louvred windows and double doors at either end. Most of these suggestions are applicable not only to Buildings 3.1 and 3.4, but also to Building 3.5. The Loughor buildings are presumed to have been single storied, although the foundation for a stair to an upper storey (or ?loft) has been noted at Micia in Dacia (Petculescu 1987, 68).

Entrances and loading bays

The evidence of an external loading-platform adjoining the upper part of Building 3.5 is particularly important as it provides rare certain evidence for the existence of this structural arrangement. It is generally presumed that most granaries had entrances at either end as in the Lunt simulation (Hobley 1982, 263). It has been further suggested that these were accompanied by covered loading areas, sometimes detectable by the presence of additional posts offset at one or both ends of the structure inserted presumably to support a continuation of the roof (Manning 1975, 113), although there is some disagreement as to whether these end entrances had accompanying loading-platforms (Pitts & St Joseph 1985, 120). It could be argued that entrances into the sides of these buildings would reduce storage space as it would be necessary to have two gangways rather than one. In the case of Building 3.5 topographic considerations may have

prevailed. The natural ground slope at the west end of the granary would have created difficulties both in the construction and use of an entrance and any accompanying loading area. The provision of a side entrance in Building 3.5 is not necessarily a unique feature, as the possibility of side entrances may explain irregularities in the spacing of the trenches at Crawford and Fendoch. In the former the spacing of the central trenches was about twice that of the outer ones, which can be assumed to indicate a heavier loading at the ends of the building (Manning 1975, 120). This may also reflect the positioning of entrances in the side of the building with the heavier grain stored at either end. Likewise the same could be argued for the Fendoch examples, where there are irregularities in the spacing of the third trench from the south end and the extreme northern trench in both buildings. However, as much of the plan here was reconstructed from very limited excavation it is difficult to draw any definite conclusions.

One other advantage of positioning an entrance in the south side of Building 3.5 is that the grain could be unloaded away from the *via sagularis*. The siting of the southern ends of Buildings 3.1 and 3.4 some four metres to the north of the *via praetoria* and the provision of a seven metre interval between the north end of Building 3.4 and the south side of Building 3.5 would likewise have enabled the delivery or removal of supplies from the building to be effected without causing unnecessary congestion on the fort's principal roads.

Storage (FIG. 62)

Structural arrangements

It is suggested that Buildings 3.1 and 3.4 were internally divided into compartments, between pairs of uprights, which were cross-braced to add to the stability to the building. Such arrangements when viewed in plan are in accord with the plans of *horrea* from Rome and Ostia,¹⁶ albeit on a smaller scale. Rickman (1971, 257–65) has suggested that civilian courtyard stores buildings may occur in military situations; the same may be true of corridor-type *horrea*, a point illustrated by the arrangement of the west part of Building 3.11 in Valkenburg 2\3 (Groenman-van Waateringe 1977, 230). The size of the rooms in that structure, at 3 m by 3 m, is identical to that of the storage bins suggested by Richmond (1938–9, 131) at Fendoch and similar arrangements are likely here. Additional storage space could have been created in the rafters by putting a ceiling over the compartments, however this would have restricted air circulation and is therefore unlikely. In the first granary there would have been room for fifteen compartments, and two fewer than this in Building 3.4; the shortfall would have been compensated by the space available in the west part of Building 3.5 (the east part of it may have been used to store other supplies). In Building 3.4 not only was wheat, principally spelt, stored but barley was also kept, probably in separate containers at the south end of the building. Although some other varieties were observed, these may be contaminants of the main crop. Barley was sometimes used as iron rations (Davies 1971, 123), but its primary uses were as an animal feed and for brewing. The granaries need not have been used exclusively for the storage of cereal crops (Frere & St Joseph 1974, 21–2; Haverfield & Collingwood 1920, 141; Hobley 1982, 263; Pitts & St Joseph 1985, 122) and other supplies would have benefited from the measures taken for the protection of the stored grain.¹⁷ Although there was no positive evidence for this at Loughor, it is possible that the adjacent buildings (3.2 and 3.3) may have been used to store additional supplies, with the east end of Building 3.3 constructed to house wagons. However, it is equally possible that these structures had some other purpose, in particular Building 3.2 which may have been used as an office or for accommodation.

Capacity, supply and storage method

Various attempts (Haverfield & Collingwood 1920, 127–42; Richmond & Macintyre 1939, 131–2; Bulmer 1969, 7–12; Manning 1975, 115–18; Gentry 1976, 23–5) have been made to calculate the possible capacity of granaries. However, the calculations are based on quantifications that are either hypothetical or have been derived from the statements of Polybius,¹⁸ or inscriptions on ostraca from Pselcis,¹⁹ neither of which are necessarily applicable to the period in which most examples of this type of building were constructed. Nevertheless, even with the

limitations to the methodologies adopted on the calculation of granary capacity (see Pitts & St Joseph 1985, 122), the exercise is perhaps still worthwhile. If Manning's formulae (1976, 115–18) are applied to the examples recorded at Loughor, then Building 3.1 would have had a storage capacity in terms of rations per man-year of *c.* 423, if the structure incorporated loading bays, and *c.* 506, if it did not. When the same formulae are applied to the replacement structure (Building 3.4) and the lower part of Building 3.5, which we presume was used for grain storage, the total capacity, if loading bays were incorporated into both structures, would have been *c.* 419 rations per man year, and if these features were omitted the increased capacity would have

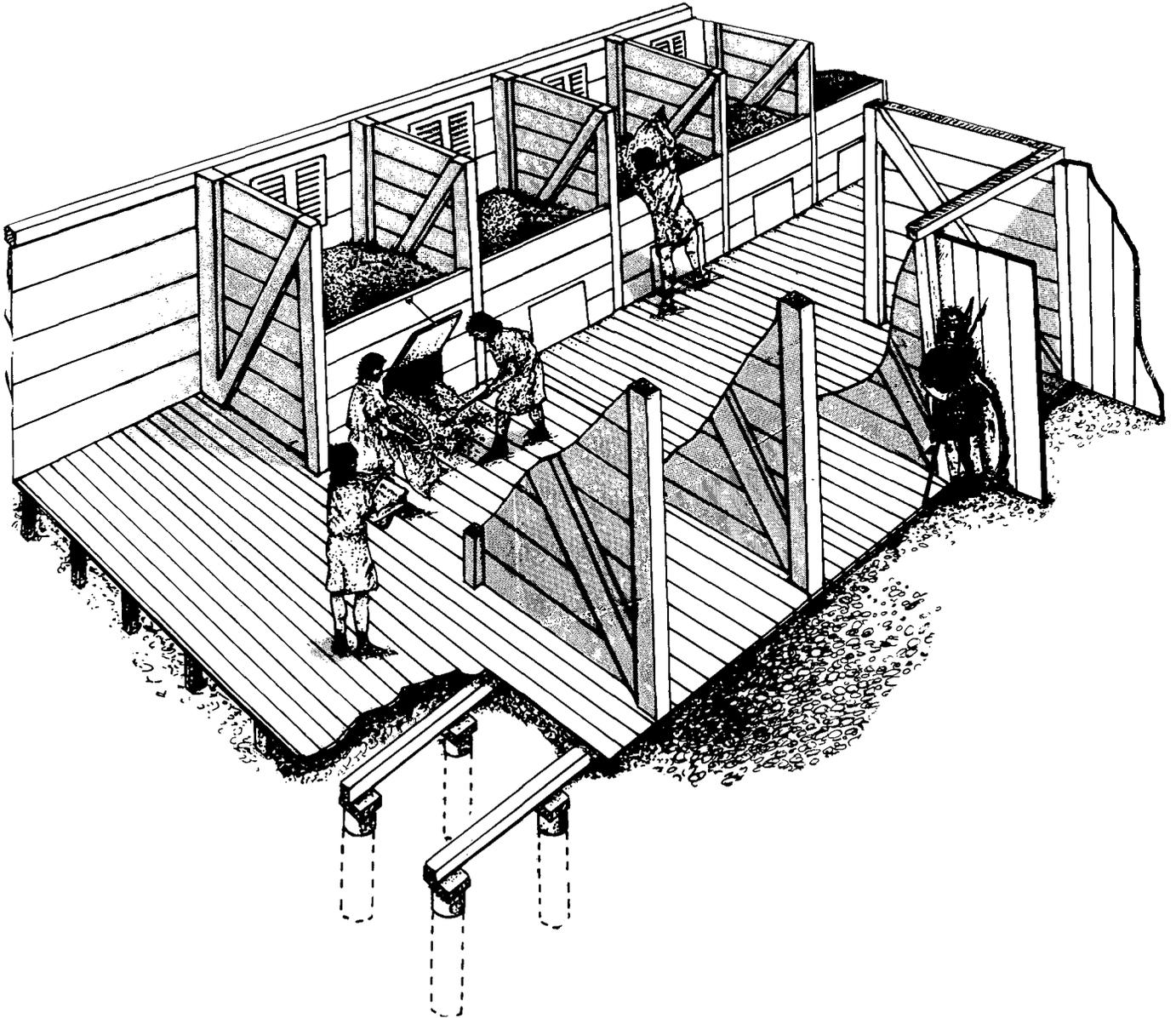


FIG. 62. Site 53: Suggested internal arrangements of Building 3.4.

been 530 rations per man year. A recent study of stone-built granaries in Dacia suggested that buildings of the order of 300 m² at Bologna and Buciumil would be suitable for a *cohors millaria peditata* and that the larger granaries at Drobeta and Slaveni were of an order large enough to hold the annual provisions for a *cohors millaria equitata* or *ala quingenaria* (Petculescu 1987, 75). If this analysis is correct then the grain storage capacity at Loughor would be sufficient to contain the supplies for a *cohors quingenaria peditata* or *cohors quingenaria equitata*. However, the arrangements in the late first-century timber granaries at Loughor may well have been different to the later stone-built Dacian examples.

Although it is reasonable to assume that the grain consumption of the average Roman soldier was reasonably constant, this of course would be dependent upon availability of resources. Tacitus records²⁰ that Agricola ensured that his forts in Scotland were provisioned with a year's supply. This was presumably the normal practice, particularly as apart from Egypt and the Near East there would only have been one harvest. The storage of grain, however, is notoriously difficult and slight changes of temperature and humidity can lead to ruination through bacteria or insect infestation which in itself creates further rises in temperature (Gentry 1976, 2–4). Several varieties of cereal-attacking pest, notably the Saw-toothed Grain Beetle and the Grain Weevil, are now known to have existed in Roman Britain (Osborne 1971, 162–3), both of which in the right conditions could have resisted the cold winter months. Although we know that the probable architectural features, the use of various preparations such as *amurca*,²¹ and other preventive measures were designed to minimise loss, there is a tolerance level to eating spoilt and inedible grain which even the toughest Roman soldier is unlikely to have overcome (Buckland 1978, 44). Moreover, as the larvae could have remained dormant in the sweepings the probability of recurring infestations would have been high.

At Loughor the preserved grain had been double-threshed and was consequently more vulnerable to insectal or fungal pollution. This presents an apparent problem if grain with the likelihood of short-term preservation was only supplied on an annual basis. Annually harvested grain, however, may not have been double-threshed at the point of supply and could conceivably have been stored in a single threshed (or unthreshed) state in large holding warehouses prior to rethreshing and delivery to the forts. In such a scenario, delivery could be made more often than once a year. It should also be remembered that, for part if not all the year, some of the troops would be seconded elsewhere on various duties and that, in this period, most of the unit would be periodically absent on campaign during the summer months. Consequently, the need to supply in a single delivery sufficient grain to support the whole garrison for a year need not necessarily be literally assumed.

Three methods of storage are possible – bins, sacks, or baskets. The first was preferred by Richmond at Fendoch but there are problems with the filling and emptying of containers as large as the ones proposed for there (Bulmer 1969, 9). The use of sacks, however, helps water and heat to dissipate more rapidly, enables the stock to be rotated more easily and reduces the risk of damage by infestation (Johnson 1983a, 123). The only advantage that baskets have over sacks is that they can be partially emptied more easily. At Loughor no positive evidence indicating the use of any of these methods was recovered. As no traces of wickerwork or sacking were preserved amongst the burnt residue of grain, even if this need not necessarily exclude their use, we have favoured the use of bins in the reconstruction drawing.

As there are too many improbables or unknowns in assessing methods of grain storage, frequency of supply, or rates of consumption, it is perhaps injudicious to use them in attempting to assess size or types of fort garrisons. In the case of the Loughor granaries, we know that Buildings 3.1, 3.2 and the west part of 3.5 were used principally for grain storage, and it would seem a natural arrangement to divide the interior into compartments. However the east half of Building 3.5 may have been used for the storage of other substances, possibly hay, and this together with the presence of quantities of barley might indicate the presence of a whole or partly-mounted unit.

PHASE 4 (FIGS 63, 73)

The residue of the charred grain deposited at the end of Phase 3 was disturbed by several features connected with the temporary occupation of the site during and following the dismantling of Buildings 3.2, 3.3, 3.4, and 3.5. The northernmost post-trench of Building 3.5 was cut by a line (2609; not illustrated) of eight shallow stake-holes.

Post-trenches 1521 and 1776

Two post-trenches, each containing a line of circular posts, average diameter 0.10 m, supported in position by layers (1369\1445, 1518) of redeposited material, may represent the position of temporary fences; the positioning of these along the edge of the *via sagularis* occurred elsewhere within the fort (see Chapter 2 *passim*).

Pits and Gullies [4186 and 4188]

Twelve small pits and shallow gullies [4186] were cut in the area between and to the south-east of the post-trenches (four of these features were not recorded on plan). These features were all similarly filled [4187]. Three shallow gullies [4188], containing similar material [4189] to that filling the pits, were located at the north end of the site.

PHASE 5 (FIG. 63)

Levelling material

The site, with the exception of the *via praetoria* and the area immediately to the north of that road, was levelled with dumps of clay, cobble, and disturbed demolition debris [4190 – see FIG. 73 for 2403, 2506) which sealed the features and structures described in Phases 3 and 4. This was a response to problems created by the local topography which demanded either levelling of the site prior to construction work starting or, as in the case of the granaries, adjustments being made to the structural arrangements.

These dumps were cut by the construction trenches of three buildings (3.6, 3.7, and 3.8) and by several other features of less regular appearance.²²

Building 3.6

Building 3.6 (2324), which encompassed an area of at least 37 m² was located in the north-eastern quarter of the site. The complete plan of the structure was not recovered, partly as a result of later disturbances and perhaps also because the remains were excavated during a period of extremely cold weather, when the ground surface became frozen to a depth of several centimetres. It is, therefore, possible that certain of the surviving construction elements may have been missed during the excavation processes, although we are reasonably certain that the majority were recorded. As a further result of these conditions, the post-trenches which formed the basal element of the structure were only discerned after the underlying levelling dumps had been removed. These features, however, were certainly later than the granaries and are best interpreted as forming part of this building.

Five post-trenches were observed; lines of circular posts, surviving in the form of voids, (av. diameter 0.14 m) were supported in four of the trenches by layers [4191] consisting of brown sandy clay containing appreciably high (25–35%) quantities of flecks and lumps of grey clay, which was similar in matrix to some of the layers dumped down prior to the construction of the building. Although no post-settings were observed in the southernmost trench (2563), the fill was of identical character to those discerned in the other foundation features. The wall represented by the line of posts in the easternmost trench was reinforced in places by additional members, in each case slightly offset. It is presumed that the posts supported walls of wattle hurdles faced with daub, particularly as quantities of these materials were recovered from the layers (2279, 2302) which directly overlay the structural remains. No evidence of the type of material used to roof the building was recovered.

The possible extent of Building 3.6 would have been limited to the north by the presumed

line of the fort defences, but the presence of Gully 2510 (assumed to be an external feature) perhaps indicates that the northern external wall had been removed, as had the west and part of the south walls, by the foundation trenches of Building 3.10 (see Phase 11). The building could conceivably have continued beyond the eastern limit of excavation, although the presumed presence of one of the fort's main dividing roads would have been a limiting factor (as was the case also for Building 3.7 and certain later structures). However, the presence of the double line of posts in the easternmost trench and the apparent absence of any other foundation features here might preclude this suggestion.

The building can be subdivided into six rooms (A–F) on the basis of the relative arrangements of the post-trenches and the location of two lines of posts in the north-west part of the structure. Although the divisions within the structure are conjectural, the suggested existence of partition walls represented by Post-lines 2662 and 2675 was reinforced by slight variations in the height of the ground on either side of those divisions. The positions of the other partitions are proposed on the basis of what logically appear to be the most likely arrangements. The lines of posts dividing Rooms B, C, and D from each other could conceivably have had some other purpose, such as supports for a dais, rather than as serving as supports for internal partitions. Given the limitations of the surviving evidence, we accept that these proposed subdivisions are open to reconsideration. No traces of the material used to floor the rooms was found; it is probable that the underlying dumps of clay were sufficient for this purpose.

The use of certain rooms can be postulated. Room A was apparently used as a latrine as it contained a shallow pit (2397) surrounded by a group of ten small circular stake-holes and subsequently filled with a layer (2344) of sand stained olive-green in colour. Room F probably served as a corridor providing access to Room E.

The shallow pits (2398, 2450) in Room B may have originally contained boxes in which tools, valuables, documents etc. were stored, as has been suggested for similar features in other military buildings (Johnson 1983a, 170). However, the use of pits for storage only makes sense if they lie under a wooden floor (? removed here) and have been dug into the sub-floor to provide the necessary depth, otherwise they ought to show signs of periodic digging and refilling every time the box was removed; indeed if simply dug into a clay floor, they would be both obviously sited thereby negating their purpose, and secondly a hinderance to normal passage in and/or through rooms.

Given the limitations of the surviving evidence, it is difficult to determine the probable function of the building with any degree of certainty. The solution may in part lie with the interpretation of Building 3.7 as a *praetorium* (see below p. 141). If so, then it would not be unreasonable to expect other structures normally found in the *latera praetorii* to be sited in the vicinity of this structure. A number of auxiliary forts of this period have additional buildings in the central range which are variously interpreted, if at all, as stores, workshops, administrative blocks, or specialist accommodation (e.g. Fendoch – Richmond & Macintyre 1939; Pen Llystyn – Johnson 1983a, 192 & 253 *contra* Hogg 1968, 133–4; Corbridge – Gillam 1977, 58–60; Wiesbaden – Ritterling 1909). The building to the east of the *principia* at 'The Lunt' (Hobley 1974, 370 and pl. 60) might be similarly interpreted, and specialist accommodation sited outside the *latera praetoria* has been recorded at the Claudian fort at Oberstimm in Raetia (Schonberger 1978). The provision of a latrine in Room A, presumably for private use, is perhaps an additional indicator that the building was probably constructed to provide accommodation for a specialist officer.

Building 3.7

Although structural aspects of Building 3.7 will be discussed prior to an assessment of function, it may be noted here that the building is interpreted as a *praetorium*.

Although Building 3.7 extended beyond the eastern limit of the excavation, it may be assumed that the greater part of the building lay within the confines of the excavation; the presence of one of the fort's north–south roads some 4 m to the east of Trench 3623\3800 would have delimited the available building plot to the east (below p. 174). Within the site the *praetorium*

encompassed an area of some 125 m². The method of construction was post-trench; the trenches were rectangular in profile, 0.50 m wide (on av.) and cut to depth of 0.36 m (on av.), although the examples excavated in the northern half of the structure were noticeably deeper (0.45 m on av.) than those in the southern half, which may have been truncated during levelling activity prior to the construction of Building 3.10 (below p. 157). It became apparent during the excavation of the building that the principal east–west post-trenches (i.e. those that extended across the full width of the building) had been excavated prior to those aligned north–south – 2523 and 3787 were particularly notable examples of this phenomenon – and the remaining east–west trenches. The severely truncated remains of a further post-trench (2528), represented only as a thin (*c.* 0.01 m thick) deposit (2485) along the side of a later feature, was discerned at the south-west corner of the building. Lines of posts were supported in place by material [4192] backfilled into thirteen of the trenches. These layers, which all contained appreciable quantities of flecks and lumps of grey clay, were similar in character not only to the layers [4193; see FIG. 73 for 2294] filling the trenches, in which, as a result of later disturbances, no post-settings were discerned, but also to the fills of the foundation trenches of Building 3.6. The majority of the post-settings were circular in shape, 0.10 m (on av.) in diameter, but a few square-sectioned examples, *c.* 0.08 m by *c.* 0.08 m, were also observed. The posts were spaced, where this could be reasonably determined, between 0.2 m and 0.8 m apart, except in Trench 3877 where they were set closer together.

Although no direct evidence for the superstructure had survived, apart from the positions of the wall posts and accompanying trenches, the layers covering part of the structure and more particularly Building 3.6 contained appreciable quantities of wattle and daub, which may have derived from the demolition of this building. In the absence of other materials, such as tile, a roof of timber shingles is presumed.

It was apparent that some degree of pre-planning had taken place prior to the construction of the building since the east–west trenches, which transversed the building, had been laid out first. These were spaced, from centre to centre, at intervals of 5 pM, 30 pM, and 10 pM respectively from north to south. However, the surviving evidence elsewhere in the building was not sufficiently well preserved for other metrological arguments to be advanced.

In plan, the building consisted of ranges of rooms and passageways around a central area, C. The position of certain entrances can be established from the recovered ground plan by gaps either in irregular post spacings or between the post-trenches, where these have not been obscured by later disturbances. Doors from C into A and E are apparent and between A and J. An entrance from H into J may be postulated from the fact that Trench 3783 did not continue eastwards, but the method of entry into K and L was not obvious. There was no direct access between K and L. The posts in the trench (3877), which represented the position of the partition wall between these two rooms, were more closely set than in any of the other surviving post-trenches, and perhaps indicate that the walling here was woven directly onto the uprights. This arrangement may imply that it was necessary to have an additional load-bearing wall in the southern range of rooms, as this area was wider than the east and west ranges of rooms, if it is assumed that Trench 3623\3800 represents the position of the eastern external wall of the building. The arrangements at the west end of L are unusual in that this area apparently opened out directly onto the veranda, M. It is possible, however, that the trench on the west side of L had been removed by a large pit (3601) cut in Phase 9; two of the posts at the south end of the veranda (M) were located in the side of this feature. Although the veranda posts were only extant at the south end of the building, the fact that the northern external post-trench (2523) was extended *c.* 0.7 m beyond the assumed line of the western limit of the building, implies that a covered walkway extended along the whole of the west side of the building. The internal size of eight rooms (A – 4.20 m², B – 8.48 m², C – 18.30 m², F – 2.38 m², G – 13.23 m², J – 19.00 m², K – 10.20 m², L – 13.00 m²) could be accurately determined.

A surface of dark yellow-brown sandy clay (2497) was recorded in A and a cobbled surface (3805\3806) in M, but surfaces were not recorded in the other rooms, possibly since the underlying dumps of clay were sufficient for this purpose or more probably because they were floored in timber. Few internal features were observed: a shallow pit (2479) containing a hearth

(2564) represented by fragments of a clay lining (2566) set on a bed of scorched Pennant sandstone cobbles (2565) was recorded in Room A; and a slot (2529) in B parallel with the north wall. There is no evidence to suggest whether these features were associated with the use of the building or its construction.

We have sought parallels for this building and for the other *praetoria* among the town-houses of the Western Mediterranean area, rather than just among other *praetoria*. The justification for this approach is to be found in the general discussion (below, p. 177).

The nature of C is not immediately apparent. There is no indication of any sort of walkway, and therefore C was not a courtyard enclosed by verandas. C was therefore either a completely open area or a completely roofed area. The difficulty in identifying doorways means that the circulation system cannot be established from the evidence available on the ground. Theoretically it would be possible for the surrounding rooms each to interconnect with its neighbour establishing a circulation system independent of C, but in practice this is unlikely since, although individual rooms in Roman houses may interconnect, circulation is through the central space. Since a completely unroofed circulation space is impractical in Britain, it seems more likely that it was roofed, the more so since it allows us to interpret F, which with dimensions of 2.3 m by 1.05 m is too small for most uses, as a light-well. The corridor H to the south of F presumably completed the circulation system by affording access to Rooms K, L, and J. Access from outside was probably through B. This may have been a portico, but it is noticeable that the settings for the uprights in the post-trench which forms its north side were smaller and less well-shaped than those in its continuation as the south wall of D. It may be that D was the portico and B a corridor.

Most of the rooms in this building are too small to have functioned as dining-rooms, although it might have been just possible to fit a set of dining couches in J or L (see below p. 180). However, L is unlikely to have been a dining-room if it had an external door: J is probably a better candidate, particularly if F was a light-well, since J is the only room (apart from C) which overlooks it directly. However, it could only have functioned as a dining-room if it had only one of the two suggested doorways. The other alternative would be the provision of an upstairs dining-room extending over more than one downstairs room, an expedient particularly suited to houses where there was restricted space for dining downstairs (Evans 1978, 178–9). Although no evidence was recovered to point to the presence of an upper storey, there was nothing which would rule out that possibility.

In overall terms the *praetorium* at 125 m² (or a maximum of 170 m², if it extended further to the east) is comparatively small; only the *praetoria* at Wiesbaden and at the *numerus* fort at Hesselbach (Batz 1973, 30–2) are of the same order. It is certainly apparent that in this phase the available accommodation space within this part of the fort was not fully utilised; the implications of this for the nature of the garrison and its commander are more fully explored in Chapter 4 (below p. 221).

Building 3.8

Building 3.8 (1115) was located in the north-west corner of the site. The surviving part of the structure encompassed an area of 24.80 m², the remainder had been cut away by the Second World War dug out and the terracing of the Station House gardens. However, it is unlikely that the total area of the building was much greater than this, as its potential maximum extent would have been limited by the assumed position of the western and northern sections of the *intervallum* road.

The construction method utilised was to support lines of circular posts, showing upon excavation as partially filled voids, c. 0.11 m in diameter, in rectangular profiled trenches filled with redeposited material [4194; see FIG. 70 for 1165). The post-trenches were 0.40 m (on av.) wide and cut to a depth of 0.45 m (on av.). The position of the posts was discerned in the majority of the trenches, but the trenches in the west part of the building were disturbed too severely for secure identification of any post-settings to be made. Although no actual evidence

of the type of material used in the superstructure of this building was recorded, it may be surmised that the posts most probably supported walls of clay block or wattle-and-daub.

Six rooms (A–F) were defined by the relative positions of the post-trenches. Two (A and E) lay to the east and three (C, D, and F) to the west of a central corridor (B). In those examples where the total room area could be assessed, it was not in excess of *c.* 5 m². No traces of the material used to floor the structure survived, but an isolated stake-hole in A and a shallow slot (1155) in E were apparently features within two of the rooms.

Entrances were difficult to locate; the close spacing of the wall posts in Trench 1144 implies that B could not be entered from Room A and probably also E. Likewise there was no access between B and D. The only definite entrance lay on the east side of E where the post-trench (1143), which had cut a possible fence (1369\1145) erected in Phase 4, terminated half-way along the room. It was not possible to tell if the corridor was entered from either C or F as the relationship between the rooms was not apparent as a result of later disturbances. All of the rooms seem too small to be suitable for accommodation purposes and are most likely, therefore, to have been used for storage.

The siting of Building 3.8 is a matter of some interest, particularly as during this period there was no apparent shortage of space within the fort. It had been constructed in an apparently isolated position and one where it effectively blocked, or at least reduced the width of, the south section of the *via sagularis*, constructed in Phase 2. The solution to this problem may lie in the proximity of the assumed position of the north-west angle of the defences to the location of Building 3.8. It would be reasonable to expect a corner-tower here and such a structure could easily have an area attached for storing munitions and other supplies.

Roads

There was no evidence to suggest that the *via praetoria* had been resurfaced during this phase of activity but the minor road running along the top of the terrace was reconstituted with a well-compacted metalled surface (3719–3721) which overlay a cobble make-up (3804\3809) and had been cut by a shallow (0.14 m) drain which had been protected to the north by a line of edging stones (3724).

Although only a small section of this access had survived, it is suggested that it probably ran along the complete length of the terrace thereby providing a link between the *via praetoria* and the northern section of the *via sagularis*, and giving access to Buildings 3.6 and 3.7 from either of these main roads.

Pits 2400, 2499, 2507 (not illustrated) and Gullies 2492, 2510, 3718

The three gullies probably functioned as eaves-drips or shallow drains. The purpose of the pits in the area between the two buildings is unknown. The layers [4195] filling these features contained small quantities of daub.

PHASE 6 (FIG. 64)

Phase 6 was represented by modifications to Building 3.7 and the excavation of a series of post-pits in the Upper Station House part of the site. It is presumed that Building 3.6 continued to be utilised during this phase.

Levelling material

Six dumps [4196; see FIG. 70 for 1010] of clay, cobbles, charcoal, and daub were deposited across the north-western quarter of the site. Some of these layers sealed the remains of Building 3.8, which had therefore been demolished at the end of Phase 5.

Building 3.7 refurbishment

The central part of Building 3.7 was substantially rebuilt; during this process or immediately prior to it several dumps of clay [4197], which covered some of the original construction trenches

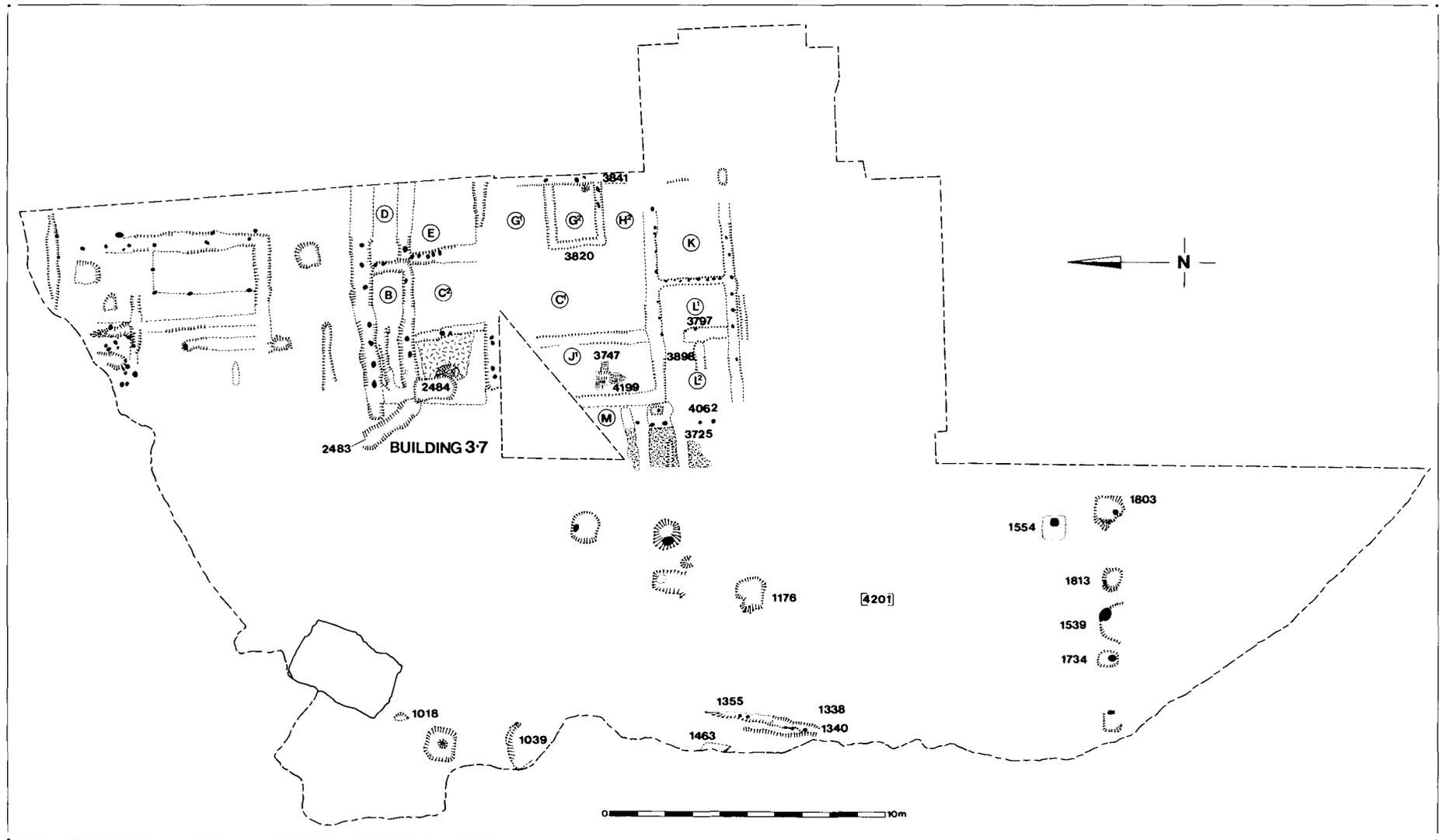


FIG. 64. Site 53: Phase 6.

of the building, were deposited. The modifications to the structure were represented by five post-trenches, 0.43 m wide (on av.) and cut to a depth of 0.23 m (on av.). Lines of circular posts (av. diameter 0.11 m) were supported in position in the trenches by a group [4198] of similar layers of grey-green or light brown sandy clay containing appreciable quantities of pebbles, lumps of clay, and flecks of charcoal. It is presumed that the posts supported wattle-and-daub walls and a roof of timber shingles on the basis of the material that overlay the remains of the building. The reasons for the modifications are not readily apparent; it was certainly not as a result of any change of use, as there is no evidence to suggest that the structure did not continue to function as a *praetorium*. However, it is significant that the principal east-west wall lines remained unaltered and apart from the subdivision of L, the modifications were restricted to the central part of the building and might possibly have been undertaken whilst other parts of the building remained in use.

There were seven new or modified rooms of varying size, or eight if C was divided into two, as suspected (see below). These ($C^1 \setminus C^2 - 23.18 \text{ m}^2$, $G^1 - 4.48 \text{ m}^2$, $G^2 - 9.00 \text{ m}^2$, $H^1 - 4.56 \text{ m}^2$, $J^1 - 13.11 \text{ m}^2$, $L^1 - 5.13 \text{ m}^2$, $L^2 - 7.29 \text{ m}^2$) were all defined by the new arrangements of the foundation trenches. No floors were recorded, possibly since the underlying dumps of clay were sufficient for this purpose or more probably because they were floored in timber. Few internal features were observed: two post-pits (3841, 4062) were recorded in G^2 and the veranda; a badly disturbed hearth (4199) in J^1 ; and a shallow (0.2 m) slot (3898) in Room L^2 . There is no evidence to suggest whether these features were associated with the alteration works on the building or its subsequent use.

The main changes took place in Room C. The southern part (C^1) was widened by 1 m at the expense of Room J, and lengthened by the elimination of F and the western end of H: the northern end, between Rooms A and E, remained unchanged (C^2). G and H were rebuilt to provide two new rooms to replace G (G^1 and G^2), the more northerly of which was open-fronted (G^1), and a second open-fronted room or double-width corridor (H^1) to replace the eastern end of the earlier corridor, H. Room J^1 was now too narrow to have functioned as a dining-room.

The plan of Building 3.7 as modified bears an extraordinary resemblance to the traditional form of domestic architecture in Italy, the *atrium* house: indeed, if an *atrium*-type house was not intended it is difficult to see what purposes would be served by remodelling C so that one end was wider than the other. However, as only the ground plan survives of our building, we cannot confirm that it was indeed an *atrium*-type house, since this would depend upon establishing from the superstructure that C^1 was indeed a separate room from C^2 . The plan is paralleled very closely in the SUNY house (now re-named the House of the Skeleton) from Cosa (Bruno 1970), which dates to the early part of the first century B.C., although the House of the Skeleton was larger. The only significant difference is in the southern wing where the main entrance, which would be expected here, does not appear. If this interpretation is correct, Room C^1 would be the *atrium*, the main space from which the other rooms opened. Room C^2 would be the *tablinum* and Room G^1 the *ala*; both of these traditionally opened for their full width to the *atrium*.

If C^1 was an *atrium*, it would be a testudinate *atrium* i.e. one without an open skylight and catchbasin (*compluvium* and *impluvium*) and would consequently have to be lighted in some other manner. Although some *atria* were lighted by windows²³ this is normally only the case where there was an external wall. An alternative method was to admit light via a tile or tiles which had been specially constructed to incorporate a light-hole.²⁴ There is also no theoretical reason why the *atrium* could not be lighted by a window in the gable, if it rose above the surrounding rooms as is common, or through a clerestory.

As an *atrium* C^1 which measures only 6.2 m by 3.8 m would be unusually small, but some examples of this size are known from Pompeii.²⁵ Vitruvius recommends the testudinate *atrium* as being particularly suited to small houses (though the smallest size which he considers is 20 feet wide or 30 feet long).²⁶ The only really anomalous feature shown by our building is that, if entrance was effected through B as suggested for the previous phase, it would be through the *tablinum*, for which we do not know any parallels for a town-house, though it is common in villas.

Building 3.7 was covered by several layers [4200; see FIGS 59, 67, 73 for 1000, 1001, 2279] of burnt demolition debris, which contained appreciable quantities of burnt daub and charcoal. This material also overlay the remains of Building 3.6 and extended over much of the site, thereby sealing several of the post-pits described next.

Post-pits 4201

Four post-pits were cut through the dumps ([4196] deposited at the start of Phase 6) located in the Upper Station House part of the site, the other nine features were recorded in the southern half of the same area. All the members of this latter group were stratigraphically later than the granaries, and two (1803, 1813) could be definitely assigned to this phase as they disturbed a dump deposited in Phase 5. The others have been included in this phase, rather than Phases 4 or 5, on grounds of structural similarity.

Wherever the shape of the post-pits could be assessed, they were found to be roughly rectangular in plan (with two exceptions, 1813 which was circular and 1554 which was square). There were considerable variations in the size of these features; the largest (1539) measured at least 1.10 m by 0.86 m by 0.79 m, the smallest (1734) 0.70 m by 0.40 m by 0.25 m. The post-pits were filled with layer(s) [4202] consisting of the material originally excavated from the pits and packed back in to support the posts in position. In ten of the pits, the position where the posts had been set was recorded, however in three (1039, 1176, 1463) no evidence for these features was observed, because of later disturbances.

Eight of the post-holes were circular in shape with diameters ranging between 0.21 m and

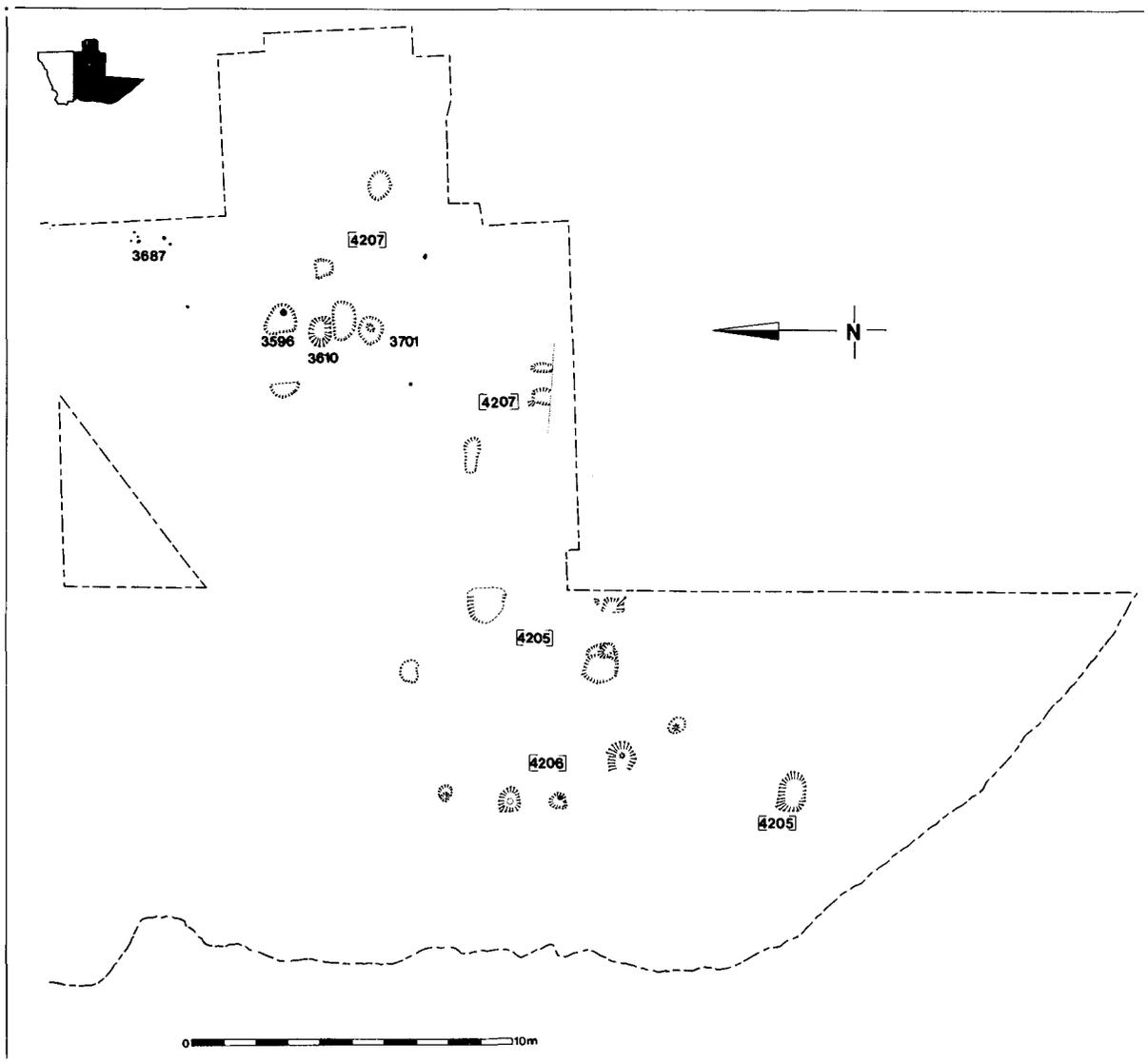


FIG. 65. Site 53: Phase 7.

0.48 m, the other two were either square (0.20 m by 0.20 m) or rectangular (0.47 m by 0.42 m). The positioning of the posts within the pits lacked conformity, some were centrally placed others to one side, or in a corner. Six of the post-holes were filled with layers of similar character (4203) each of which contained appreciable quantities of charcoal, the other examples survived within the archaeological record as negative features.

Although it is apparent that the post-settings were constructed with some significant purpose in mind, we are unable to offer any satisfactory explanation of their collective function.

Road

The road to the west of Building 3.7 was resurfaced (3725).

Gullies 1018, 1338, 1340, 2483 and Pit 2484

Two shallow gullies were located immediately to the north of Post-pit 1463. Both of these features were aligned north–south and contained rubbish deposits (1337, 1339). A line of six circular stake-holes (1355) was cut into the bottom of the easternmost gully.

The end of what appeared to be another shallow gully (1018; not illustrated) was located c. 2 m to the south-west of the pill box and a similar feature (2483) was cut through the south-west corner of Building 3.5. The latter feature was in turn cut by a rectangular pit (2484) filled with two deposits. The lower layer (2481) was formed from sand stained olive-green in colour and had been capped by a dump of clay and stone (2480). All three features underlay the same material which covered the remains of Buildings 3.6 and 3.7.

The purpose of the gullies is unknown, but Pit 2484 had been used as a depository for waste products. The relationship of this pit and Gully 2483 to Building 3.7 is of note, as it was apparent that both features had cut the north-western corner of the *praetorium* but were sealed by the same demolition debris that overlay the building. Consequently, it is likely that these features were cut during the demolition of Building 3.7 and, therefore, it may also be assumed that the *praetorium* was deliberately dismantled, any reusable materials retained and the residue burnt *in situ* and dispersed to level up the site.

PHASE 7 (FIGS 59, 65, 67, 70)

Levelling material

Following the demolition of Buildings 3.6 and 3.7, the area to the west of and along the edge of the terrace was levelled up by the deposition of thirty-eight layers of turf, cobble and gravel, clay, domestic refuse and sand [4204; FIGS 59, 67, 70 for 578, 601, 817, 818, 822, 903, 1020] which effectively levelled the area to the west of the terrace. These deposits sealed all the underlying contexts to the west of the terrace except the *via praetoria*. One layer, a dump of turf (796\2351; FIG. 59) extended on both sides of the terrace so that it overlay part of the demolition debris (1000\2279) derived from Buildings 3.6 and 3.7. The combination of the dumps and demolition debris thereby provided a secure stratigraphic separation between Phases 1–6 and later structures.

Pits [4205], [4207], Post-pits 3596, 3701, [4206] and Stake-holes [3687]

In the Upper Station House part of the site, the dumps were cut by eight amorphous pits (three were not recorded on plan) and a semicircular arrangement of five post-pits [4206]. Two further post-pits, a second group [4207] of nine amorphous pits (one was not recorded on plan) and six stake-holes [3687] as well as three isolated stake-holes were located in the southern half of the gardens of 6 and 8 Dock Street.²⁷ In the post-pits, the posts were supported in position by material [4208] excavated from the pits and then packed back in. In plan one of the post-pipes (847) was square (0.20 m by 0.20 m). The others were circular 0.20 m diameter (on av.). None of the post-pits were cut to a depth in excess of 0.72 m, but in some instances the post-settings had been cut to a deeper level than the surrounding pits.

The pits were filled with layers [4209] of clay and stone infrequently flecked with charcoal

and daub. The fill (3611) of one of the pits in the 6 and 8 Dock Street part of the site (3610) contained the remains of a cremation burial. This poses particular problems as this can only have occurred at a time when the fort had been abandoned. On stratigraphic grounds this abandonment could have occurred in this phase at the earliest or at the end of Phase 9 at the latest, but there is insufficient dating evidence to determine which phase is the more likely. It can be noted, however, that following Phase 9, a short-lived phase of temporary activity was recorded prior to rebuilding taking place, but this activity was not accompanied by the widespread levelling noted in Phase 7 and at the start of Phase 8. The presence of the turf layer (796\2351) is perhaps significant, as this may reflect modification, refurbishment, or alternatively levelling of the rampart, during or shortly before this phase of activity. Although evidence for slighting of the rampart at this time was not observed in the sections opened out across the defences, it need not necessarily have survived in the archaeological record or the modifications may have been localised and therefore not apparent in the parts of the defences so far examined. If the rampart was slighted, then the dumping of other materials here could be part of general 'tidying up' activities before the fort was left unoccupied. In such a scenario it is possible (although somewhat irregular) that a soldier might have been buried by his comrades on what was no longer an inhabited site, or perhaps more likely that inhabitants of the (?) *vicus* used the abandoned fort site rather than the fort cemetery, which is presumed to be located to the east of the fort (below Chapter 4). It remains to be noted that three cremations were also found within the limits of the fort in 1970 (Ling & Ling 1973, 114–15). These had been cut into the rear of the north-eastern angle of the rampart. As the pottery associated with them was of Hadrianic date, this provided a *terminus ante quem* for a further abandonment of the fort.

The purpose of the other features cutting these layers is not apparent, although some of the post-pits may be connected with the construction of the succeeding building (see below Phase 8) and the pits had been used for the deposition of rubbish, although they were not necessarily excavated for this purpose.

DATING EVIDENCE: PHASES 4–7

The levelling material deposited at the start of Phase 7 provided a secure stratigraphic separation between Phases 1–6 and later structures. Two coins (Cat. Nos 44 & 51) from these deposits, issues respectively of Domitian dated to 86 and Nerva dated to 96–98, provide a clear *terminus post quem* for the activity in Phase 7. Although small quantities of BB1 were encountered from Phase 5 onwards, in a South Wales context this need not cast doubt on a Flavian date. The

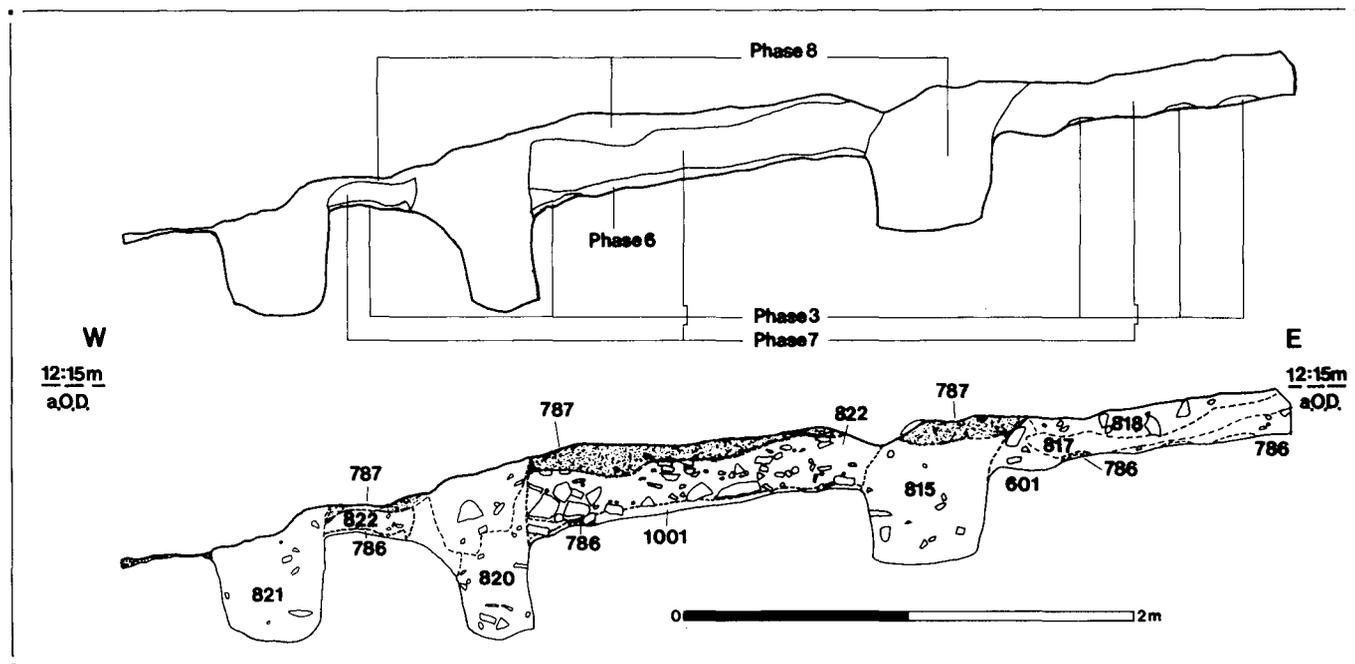


FIG. 67. Site 53: South-facing section across south-east quarter of Building 3.9.

other coarse pottery and the samian, with the exception of a stamp of *Aper i* (Cat. No. 25) from a layer sealing Building 3.8 which is unusual in a Flavian context, is consistent with a late Flavian/early Trajanic occupation. An occupation date range of *c.* 85–*c.* 100 for Buildings 3.6, 3.7, and 3.8 and the other activity in these phases is therefore suggested.

PHASE 8 (FIGS 66, 67, 68, 70, 81)

Phase 8 was represented by the construction of Building 3.9 (640), the resurfacing of the *via praetoria* in the Upper Station House part of the site, and the laying out of two roads in the Nos 6 and 8 Dock Street area.

Building 3.9

The construction of this building was facilitated by the dumping of material in Phase 7, particularly along the western and northern edge of the Upper Station House area, which effectively created a level platform through which sixteen post-trenches were cut (FIG. 67). The post-trenches, rectangular in profile, were 0.53 m (on av.) wide and cut to a depth of 0.63 m (on av.) deep. In eleven of these features lines of circular post-holes, with an average diameter of 0.14 m, were defined by layers of back-filled material [4210; FIG. 67 for Contexts 815, 820, 821]. The remaining trenches were too severely disturbed by later features for the positions of the posts to be recognised. However those parts of the fills [4211] of these features which were undisturbed were sufficiently similar in character to suggest that they were part of the same structure.

The post-settings represented the position of timber posts, which acted as stiffeners in a clay wall (cf. Perring *et al.* 1991, 82, fig. 70d) here faced with plaster. Wherever the spacing between the posts could be determined, it was between *c.* 0.6 m and *c.* 0.8 m. Several stubs (636–638, 644, 661, 663) of the green-grey clay walls had survived to a height of *c.* 0.05 m–0.10 m. These features were 0.12 m (on av.) wide at the base. The plaster (see Plaster report Cat. No. 2) was painted white with occasional black horizontal and vertical bands. On all the surviving wall fragments the plaster extended to the base of the wall where it adjoined the floor surfaces. The latter (586, 639, 664–669, 809, 1012\1158; FIGS 67, 70, 81) were formed from a gravel aggregate bonded by a white lime mortar. At the north end of the structure the floors were represented by a hard well-surfaced layer; elsewhere, this had disintegrated, presumably as a result of leaching, to little more than a loosely bound pebble spread. In one room (C) no mortar floor was observed. This area, which was slightly sunken, contained a layer of burnt debris (659) perhaps the remains of a timber floor, but evidence of destruction by fire was not found elsewhere in or above the building (see below p. 154). It was externally butted to the west by a quarter-round moulded section of mortar floor (702) 0.07 m thick. The floors in the other rooms were set on dumps of clay (743\787, 801, 802) which sealed the post-trench fills but not the posts (see FIG. 67) and part of the dumps [4204] deposited in the previous phase, consequently the timber framework which formed the core of the superstructure must have been erected, at least partially, before the deposition of the flooring material. At the point where the floors met the wall facings they had been thickened deliberately in some places to such an extent that a quarter-round moulded effect was produced. The thickening of the floor presumably provided additional support for the wall posts and prevented excessive lateral movement, which was further inhibited by the positioning of cobbles around some of the posts in the underlying trenches. The material used for the mortar floor, the clay wall infill, and the plaster rendering could all have been obtained locally, and presumably applied wet. If so, it is possible that the roof of the structure was in position prior to the deposition of these materials in order to afford them some protection from the weather whilst they dried out. The lack of ceramic or stone tiles in the layers associated with the building suggests that the roof was constructed using a different medium, perhaps timber shingles.

Twelve of the post-trenches were so arranged that they formed a range of rooms, which was parallel with and next to two circulation areas (D & E), and were comprised of three discrete rectangles (Rooms B, G & H) adjacent to other areas (A, C & K) open-ended to the

east and west. The arrangement of the post-trenches is peculiar, as it might have been reasonable to expect the substructural arrangements to consist of continuous longitudinally-aligned parallel trenches joined by transversely set divisions. The reason for this layout is difficult to determine but as the post-trenches represent the position of the principal walls it is likely to reflect a deliberately conceived plan. The size of these rooms could be determined with a reasonable degree of accuracy (A – 14.45 m², B – 48.64 m², C – 17.34 m², D – 40.63 m², E – 14.40 m², G – 28.89 m², H – 25 m²). The enlarged size of Room B which was *c.* 0.5 m wider than G and H, would not in itself have caused a problem with roofing the structure as a saddleback roof with the main ridge running north–south along the centre of the building is envisaged.

The size and the extent of the other rooms is more difficult to determine. One factor here is the likely extent of the building to the west and north. In either direction the fort defences and *intervallum* would have restricted the available building space. If the line of the *via sagularis* on Site 55 continued westwards unaltered, then the distance between its southern edge and the north wall of Room G would have been 17 m (see FIG. 88). The available space to the west is more difficult to calculate, but given the likely line of the defences (FIG. 88) and the location of the *intervallum* road in Phases 2 and 3 (above p. 117, FIGS 55, 58), it is unlikely that the western limit of Building 3.9 was more than 1–2 m beyond the furthest limits defined by excavation (i.e. the western extent of Room P), otherwise this would have entailed the removal of the entire *intervallum*. Given the above, it is suggested that the structure is unlikely to have measured in excess of 35 m by 15 m, an area of *c.* 525 m²; of this hypothetical maximum *c.* 335 m² was recorded.

The close-spacing of Post-trenches 907 and 908 is odd. They, and the spacing of the posts within them, seem to be too close for the area to have served as a veranda. It is possible that one of the trenches (908) replaced the other, particularly as the mortar floor in Room D appeared to extend across 907, but there was no certain evidence to suggest that these trenches need not have been contemporary. An alternative is that 908 served in part to support a small terrace (M), a suggestion perhaps enhanced by the different floor levels between M and those (D and E) to the west (see FIG. 67); this might have helped to ensure a pleasant vista over the estuary from D and E. Although not proved during excavation, of the possibilities outlined above it seems on balance most likely that 908 replaced 907 as the external wall for Areas D and E; modifications to the building (Phase 9 below p. 153) lend weight to this supposition. N appears to have been an open area to the west of M but defined to the south by F, unless 908 was a replacement for 907 in which case this area would have been open as well, and to the north by J and P. This range of rooms was apparently offset from the northern end of the east range, as the area designated L, which was only enclosed on two sides, presumably served as a yard (if so the patches of mortared ‘flooring’ recorded here may represent the remnants of builders’ mixing-platforms). Room P was formed by cutting a rectangular pit (1833) to a depth of 0.75 m, the base of which was then floored with a pebble aggregate concreted in white mortar (1827) and set on a foundation of clay-bonded sandstone cobbles (1831).

The position of certain other superstructural features can be suggested from the ground plan. Entrances may have been deliberately constructed at either end of K, the east end of A and perhaps also C and the south end of D by the arrangement of the post-trenches rather than by leaving gaps in the post lines, unless the walls simply continued across these gaps, but if so there seems little point to the peculiar ground plan. Any entrances on the east side of the building could only have been reached by steps cut into the terrace and must have opened inwards. Most are likely to have consisted of single doors – perhaps double in the case of C – supported on timber jambs fixed by peg or nail to the wall frames and mortised into a threshold resting on the ground surface. Significant gaps in the otherwise evenly spaced posts (where this could be determined) imply doors between D and G, and from H through D into M and/or N. The lintels and jambs for these entrances could have been easily incorporated into the timber framework. The position of the post-trenches need not have represented the location of all the walls of this building. Fabricated as plaster-faced clay block partitions resting directly upon the mortar floor, they might not have survived in the archaeological record. Such divisions might

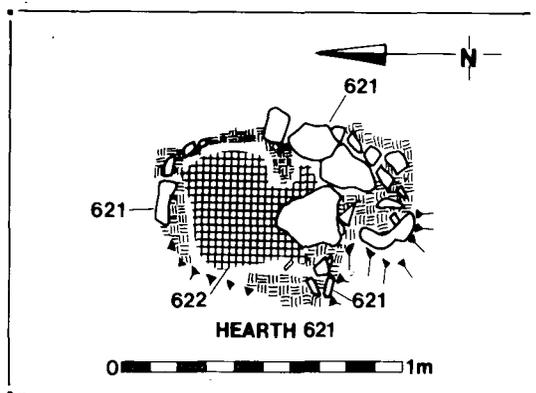


FIG. 68. Site 53: Hearth 621.

have existed at the north end of D as a continuation of Context 963, at either end of E, and internally in B, G, and H. Entrances could be incorporated into this form of wall with ease.

Few internal features survived: a hearth (621 – see FIG. 68), 0.65 m in diameter, constructed from ceramic tile fragments set in grey clay (623) in D would have been an obvious obstacle in a corridor or passageway and is probably associated with the construction of the building or more probably its subsequent modification (see Phase 9 below p. 153); a shallow (0.15 m) gully (703) running down the south side of Room C and through to N appears to have been a drain, a supposition enhanced by the recovery of a lead drain-cover from its course during the 1973 excavations (Ling & Ling 1979, 27).

An unmortared pebble layer (762 – FIGS 66, 81), recorded between the south end of the structure and the *via praetoria*, presumably served as hardstanding.

The function of the building is not certain, and, as evidence from the modifications to the original plan (see Phase 9 below p. 153) provides further evidence for the possibilities, discussion is reserved for a subsequent section (below p. 154).

The *via praetoria* and other roads

The *via praetoria* was resurfaced (232) and fronted by a new earth-cut drain (682), 0.5 m wide and cut to a depth of 0.35 m. It is assumed that the refurbishment of the *via praetoria* and the cutting of a new roadside drain are more likely to have occurred during a major phase of rebuilding. However, on stratigraphic grounds, this cannot be completely substantiated and it is possible that this activity had occurred in an earlier phase.

The road [4174], which had run along the top of the terrace in Phases 2, 3, 5, and 6, but which had been sealed by the dumps deposited at the start of Phase 7, was reconstituted [4212]. It was represented by six areas of small cobbles, stones, and pebbles densely packed into brown sand, which at the north end of the road overlay a gravel 'make-up'. At this point the road was joined from the east by a second access [4175] represented by nine patches of a metallised surface of identical construction. The east–west aligned road was at least twice as wide (more than 4 m) as the north–south oriented access (less than 2 m). Road [4212] would have provided access to the east side of the building from the *via praetoria* and Road [4175] would have presumably joined the road located in the gardens of No. 4 Dock Street (below p. 174) and thereby have provided an additional link between the *praetoria* and the *principia*, assuming that the latter building was sited in the centre of the fort.

PHASE 9 (FIGS 67, 69, 70)

Certain parts of Building 3.9 were altered and the *via praetoria* and Road [4212] resurfaced. At the end of this phase Building 3.9 was dismantled. A number of pits and slots were cut in the area to the east of the structure, prior to its destruction.

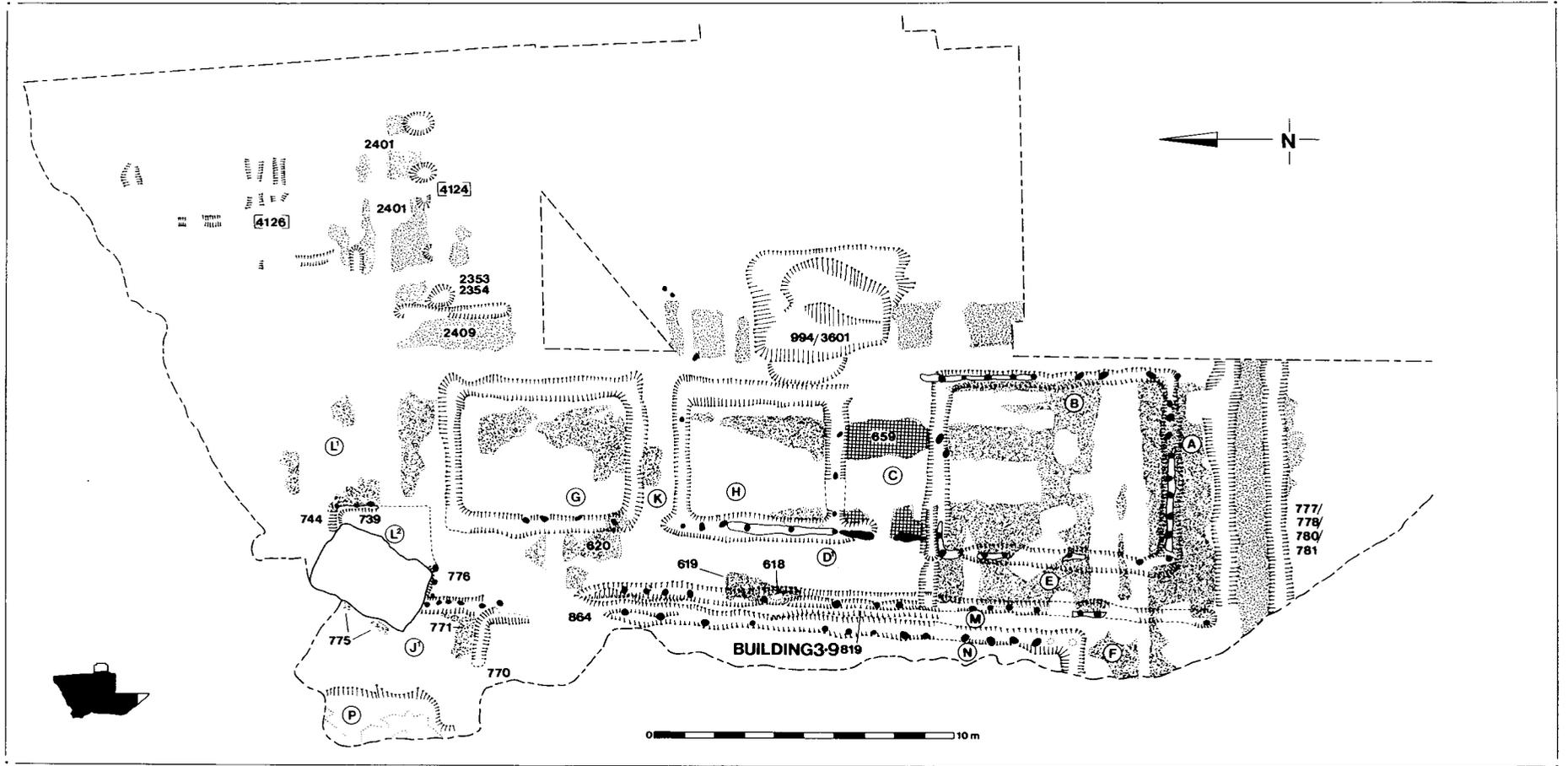


FIG. 69. Site 53: Phase 9.

Building 3.9 refurbishment

The principal alterations to Building 3.9 reflect the nature of the construction and possible function of Room L². This was represented by a rectangular pit – most of which had been removed by the construction of the pill box and associated dug out – which disturbed one of a series of levelling dumps (764, 765, 888–892) in the southern half of Room J. Removal of the fill exposed parts of two post-lines, each consisting of three post-holes set against the vertical eastern and southern sides of the pit. The post-holes, which formed the core of two plaster-lined (557, 774) clay walls (744, 776), were circular in shape measuring 0.08 m (on av.) diameter by 0.26 m (on av.) deep. A 1.5 m length of mortar floor (739) with a quarter-round moulding was observed at the base of the eastern wall. The construction of this structure thereby divided the former yard L into the new areas L¹ and L² and resulted in modifications to Rooms D and J. The plaster rendering the walls of L² was decorated in a manner identical to that found elsewhere in the building.

The positioning of this structure in the south-west corner of the yard would have blocked off the postulated entrance into D, the southern half of which was resurfaced (619\620). It is probable, for the reasons given elsewhere (above p. 150), that D was extended by *c.* 1 m to the west by replacing the former external wall (907) with a new line (908) which turned westwards at its southern end to create a further area (F), but this cannot be proved conclusively.

In Room J a layer (1157) of grey-brown silt over the northern part of the mortar floor (1158) was cut by a sub-circular pit (1151; not illustrated) filled with layers of domestic refuse (1141, 1148, 1149, 1832) in turn underlying dumps of gravel, clay, and rubbish (1124, 1130–1132, 1140; FIG. 70). These dumps were sealed by a new mortar floor (771\775; FIGS 69, 70), which was *c.* 0.4 m higher (11.00 m OD) than its predecessor and at approximately the same level as the base of L² (OD 11.04 m–11.10 m).

The drain leading out of Room C was diverted northwards by means of a gully (819\864, for the fills 816\861 see FIG. 67), 0.35 m deep, into the southern part of Room J¹, where it (770), similarly filled (766), turned westwards (770), and cut through the new floor. In D the gully was cut through the top of Post-trench 907 next to the wall uprights, and this must have had a detrimental affect on the stability of the wall had it continued in use and is a further point in favour of the suggestion that this wall was replaced (908), thereby extending Room D to the west. These new drainage arrangements are perhaps indicative of the function of L² as a tank, a suggestion supported by the fact that the area was deliberately sunk and that the floor in J¹

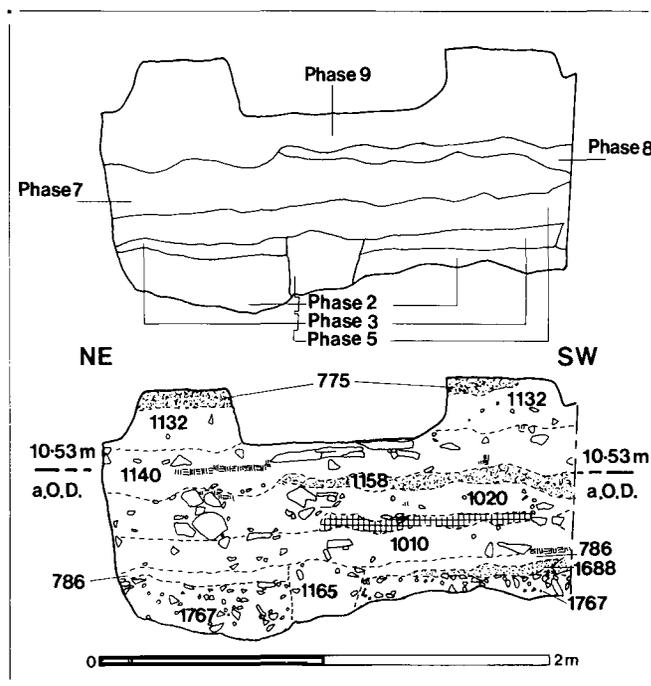


FIG. 70. Site 53: North-west facing section below modern pill-box.

had to be raised, presumably in order to reduce the effects of external pressure on the wall to the east of J¹ created by the weight of water in the tank, and thereby reduce the risk of collapse or flooding. A small hearth (618) located in D¹ is probably a feature connected with the reconstruction works.

It was apparent from plaster fragments recovered from the demolition debris [4213] that the walls had been prepared for repainting, as a thin slip had been applied over the original black and white surface and in places this had been pecked. However, the structure was abandoned (see below) before the new coats of plaster could be applied.

Roads

The roads to the east of Building 3.9 were repaired with new surfaces (2401, 2409) as was the *via praetoria* (777, 778, 780, 781). The *via praetoria* drain was filled (677; FIG. 81).

Pits [4124] and 994\3601²⁸

The roads to the east of Building 3.9 were cut by seven relatively small rubbish pits [4124] and one substantial example (994\3601). The smaller features varied in size, the largest (2360) measured 1.10 m by 0.70 m, the smallest (2366) 0.34 m by 0.20 m. They were cut to varying depths – between 0.10 m and 0.43 m – and had been filled with clay, stone, charcoal, and daub [4125]. In the largest of these pits, this material (2354) overlay an earlier deposit of ‘cessy’ material (2353), but there was no certain indication that this feature had been temporarily used as a cess-pit. Several iron and copper-alloy objects (Cat. Nos copper-alloy 58, 59, 72; ironwork 20, 21, 43, 68–70, 109), including a dolabra, an anvil, two T-shaped lift keys, a steelyard arm and counter balance, and fragments of a box, which contained bronze scrap, were buried in this particular feature. The more substantial pit was located some 12 m to the south of the other features, it measured 5.2 m by 3.5 m and was cut to a depth of at least 2.1 m; however, exigencies of safety precluded the full examination of this feature. It was similarly filled (629, 987, 988, 3550, 3602–3604, 3612) to the other pits. This feature may have been cut to extract raw materials for construction elsewhere in the fort.

Slots [4126]²⁹

The north end of Road [4174] was cut by one of a group of slots (4126). These features, which measured 1 m–3.5 m in length by 0.28 m (on av.) in width, had been cut to a depth of 0.15 m (on av.). They were similarly filled [4127] to the pits. The purpose of these features is unclear.

Building 3.9 demolition method

As well as sealing the surviving structural elements of Building 3.9 the demolition debris overlay the roads and the large pit (994\3601) to the east of the structure. These deposits also partially filled the drain and associated gullies in the western half of the *praetorium*. As there was no evidence of destruction by fire, apart from the burnt deposit in Room C, or for accidental collapse, it is probable that the building was dismantled piecemeal.

BUILDING 3.9: DISCUSSION OF FUNCTION

The plan of Building 3.9 is extremely unusual, and a number of alternative functions are possible. The original excavators, on the basis of their limited examination, suggested that the structure may have been a bath-house (Ling & Ling 1979, 22–3), but this argument was based in part on a mis-interpretation of the relationship of the mortar floor with certain foundation trenches for stone walls, which have subsequently been shown to belong to a later building (3.12; below p. 169). This was understandable given the limited areas examined and the complexity of the stratigraphy. Despite the evidence for drainage within the building, the recovered plan and absence of heating arrangements militate against the bath-house interpretation, which may now be rejected. This leaves two other alternatives from the classes of buildings that one might expect to encounter in a fort. These alternatives are *praetoria* or *fabricae*.

Before discussing the reasons for and against both these possibilities, some comment with regard to the use of space in and movement through the building is required. The surviving section of the building is arranged along the corridor D, which is the main circulation space. The plan suggests that it was divided from E only by the drain, which in turn suggests that D and E are conceptually the same space, and that E has been narrowed to allow B to be wider. K is likely to have been an entrance (it is too narrow for most other purposes, except perhaps storage), though in this case, it is uncertain what was happening at the north end of D, which could have provided an entrance, as could the east end of A. A veranda, as defined by Post-trenches 907 and 908, does not (for reasons expressed elsewhere: above p. 150, below) seem feasible, and these trenches should be seen as serving as successive eastern external walls for the core of the building.

In favour of an interpretation as a *praetorium* is the fact that the core can be paralleled as a house-plan, as it has distinct affinities with the typical second-to-third-century flat at Ostia, which consists of a circulation corridor with rooms on either one side (as here) or two, most of these rooms being small, but with a large room at one end which could serve as a dining-room (Packer 1971, type II, fig. 12).³⁰ However, in comparison with the other *praetoria* at Loughor, there are very few rooms (unless these were subdivided by free-standing partitions and there is neither certain evidence for or against such a possibility) and they are very large: G and H are larger than the largest rooms in Buildings 3.7 (above p. 139) and 3.10 (below p. 157); and as large as the smallest rooms in Building 3.12 (below p. 169) which is a far more extensive building. Further points in favour of the *praetorium* hypothesis are: the decoration of the walls, albeit in the basic 'Nebenzimmer' style (Stroka 1979, 101–4), with painted plaster; the fact that the other buildings preceding or following Building 3.9 can certainly be identified as *praetoria*; and the general absence of the type of features, such as hearths or anvil bases, that might be expected to be found in a *fabrica*.

There are, however, a number of factors which support the suggestion that the building might have functioned as a *fabrica*. Stratigraphically most of these are identified as belonging to the second phase of use, and it is possible that these relate to a change of function. In the second phase of use the drainage system leaving Room C was expanded, a tank (L²) constructed in the south-west corner of the former yard and industrial waste and tools deposited in pits cut to the east of the building. The presence of scrap indicates the recycling of equipment (Bishop 1985, 7) and almost certainly the occurrence of industrial activity, but the material found in these features need not necessarily have been derived from Building 3.9. *Fabricae* are represented by a number of different building types (von Petrikovits 1974, 399–407 and 1975, 91–8). The winged plan of Building 3.9, with the large open rooms (G, B, H) to the rear, has some broad points of similarity with certain members of his 'Doppelhakenformig' group. In particular, Building 3.9 resembles the winged elements of the much larger *fabricae* in the legionary fortresses at Novaesium and Lambaesis. However, *fabricae* have not often been positively identified in auxiliary forts, but where so (Oberstimm – Schonberger 1978; Wiesbaden and Valkenburg ZH – Schonberger 1979 (but see Groenman-van Waateringe's (1991) refutation of Schonberger's identification of Building 3.11a at Valkenburg as a *fabrica*)) they are of the 'Basartyp' (von Petrikovits 1974, 404 and Abb. 3), resembling the *fabrica* for example in the legionary fortress at Haltern, and are represented in plan by a series of interconnecting rooms around a central court or courts containing a central water-tank.³¹ As neither Schonberger nor Groenman-van Waateringe have noted, a tank in a courtyard might equally well be interpreted as an ornamental pool, a feature common in the context of domestic architecture. Tanks in fact might have a wide range of functions, one in the annex of the *praetorium* at Hofheim was apparently used to store oysters (Ritterling 1913, 46).

Other 'Basartyp' workshops may have existed at Caernarfon, 'The Lunt', Hofheim, Hod Hill, and Rottweil (Johnson 1983a, 186) but the evidence for these is equivocal, as it is for the winged type, although Johnson notes (1983a, 187) that these can be detected in the forts at Bearsden, Gelligaer, and South Shields. The *fabrica* at Oberstimm contained a series of water courses and a sunken area in Room 4, which was perhaps used for smoking and preserving meats (Schonberger 1978). The presence of a system of drainage gullies identified in the second phase

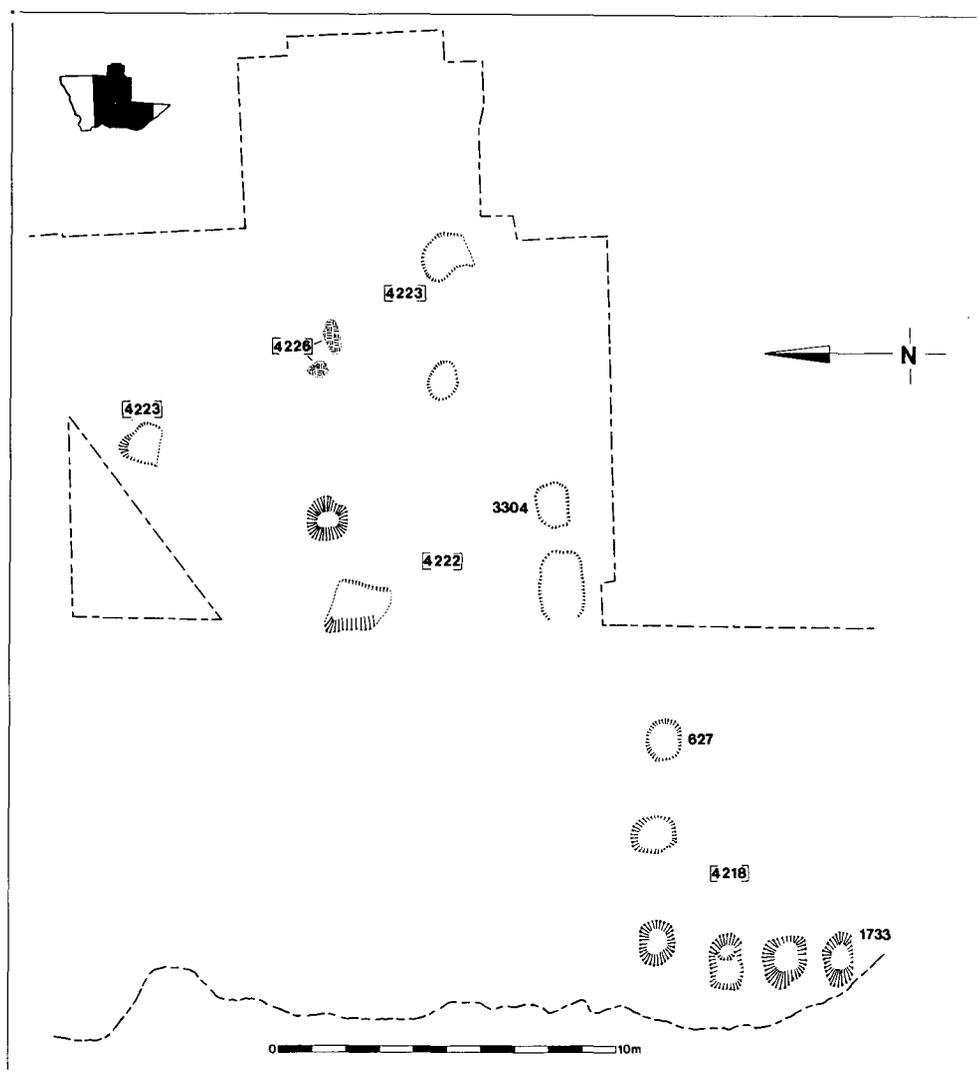


FIG. 71. Site 53: Phase 10.

of Building 3.9 is difficult to explain or parallel in a *praetorium*, and the sunken area P, provisionally identified as a cellar, could conceivably have had some other purpose.

There is therefore evidence for both possible interpretations, and it is difficult to be certain which is correct. The evidence seems to us to weigh more heavily in favour of a domestic use in Phase 8, perhaps followed in Phase 9 by a conversion to an industrial use, particularly because of the extensive water management system in this phase, which is odd in a domestic context. In either case the function and unusual plan of the building together with the fact that only half of the available building plot was used has a bearing on the nature of the overall use of the fort, and this is discussed further in Chapter 4 (below p. 210).

DATING: PHASES 8 and 9

There is no numismatic evidence from these phases. The coarse pottery is consistent with a Trajanic date, although the samian is predominantly Flavian. The occupation must date after 96–98 but cannot be extended much later than 105. A date range for these phases of *c.* 100–100\105 is, therefore, suggested.

PHASE 10 (FIG. 71)

Pits [4218, 4222 and 4223]

Six pits [4218] were located in the southern half of the Upper Station House part of the site. Five of these features were cut through the demolition debris described in the previous phase,

the other (1733) is included in this group on the basis of its similarity in shape and fill. The pits were arranged in an 'L-shape'. They were all circular or sub-circular in shape, the smallest measuring 1.40 m by 0.80 m and the largest 1.60 m by 0.95 m in diameter, and were cut to a depth between 1.10 m and 1.70 m with the exception of 627 which was shallower (0.75 m). The pits were filled with rubbish deposits [4219, 4220, 4221] including plaster, some of which was identical to that associated with Building 3.7.

A second group of pits [4222] was located some 5 m to the north-east of the features described above and three other pits [4223] were discerned to the north of this group. All these features were of similar shape to the pits located in the south-western quarter of the site and had disturbed the underlying demolition debris. The largest feature measured 1.94 m by 1.38 m, the smallest 1.00 m by 0.97 m. They were cut to a depth between 0.31 m and 1.05 m and were, therefore, somewhat shallower than the first group of pits. The features – with the exception of 3304, which was filled with an organic rich loam stained brown-green (3318) and sealed by a layer of clay and burnt daub (3306) – were filled with rubbish deposits (3614, 3635, 3641, [4224]), but no plaster was present.

The pits are presumed to have been excavated in order to extract sands and gravels for building purposes.

Clay layers [4226]

There were four areas of green-grey clay [4226; two of these are not illustrated], the largest (3552) of which measured 1.34 m by 0.47 m and was set on a cobble base (3553). The function of these deposits is not apparent.

PHASE 11 (FIGS 72, 73, 80, 81)

Phase 11 was represented by the construction of Buildings 3.10 and 3.11 following the dumping of layers above the demolition debris from Building 3.9. The *via praetoria* was widened and a new road drain cut.

Levelling material

The pits and other features cut in Phase 10 were sealed by dumps of gravel and domestic rubbish [4227; see FIGS 80, 81 for 590). Three of these deposits (600, 604, 650) were dumped against the west side of the terrace and effectively reduced the height differential between the western and eastern halves of the site.

Building 3.10

An earthfast timber-constructed building was located in both the Upper Station House and the Nos 6 and 8 Dock Street parts of the site. Although the building continued beyond the north-western and eastern limits of the excavation, it was possible to assess that it would have encompassed an area of between 580 m² and 675 m². The structure was 32.9 m long (i.e. from north to south) and is unlikely to have exceeded 20.6 m in width, as the east side would have been delimited by one of the fort's principal internal roads (see Phase 13 below p. 174), in terms of Roman measurements this equates to a building with likely intended overall dimensions of 110 pM by 70 pM. Although structural aspects of Building 3.10 will be discussed prior to the assessment of its function, it can be noted at this stage that the structure is also interpreted as a *praetorium*.

The greater part of Building 3.10 was constructed utilising post-trench foundations; however, sill-beams were preferred in the north-western corner. A possible reason for this may have been that this was the lowest point of the structure and consequently greater ground-loading would have been required to support the additional weight and height of walling needed to achieve level roofing over the whole of the west wing. The square-profiled post-trenches measured 0.56 m (on av.) in width and 0.47 m (on av.) in depth. However, the post-trenches in the south-eastern corner of the building were, on average, some 0.30 m shallower than those in the rest of the structure, principally as a result of post-Roman disturbances. The beamslots were slightly

narrower (0.47 m (on av.)) and shallower (0.18 m (on av.)) than the post-trenches. The individual posts were supported in position by one, or sometimes two, layers of material [4228; see FIG. 73 for 2100, 2205, 2231] which had been excavated out and then packed back into each post-trench. The beamslots were similarly filled [4229]. The lines of post-settings were comprised principally of circular members each with an average diameter of 0.12 m (range 0.05 m–0.23 m). A total of 212 posts or post-settings was observed; six of these were square or rectangular, another fifteen had survived in a charred condition. These latter examples were both circular (0.07 m (on av.) in diameter) and square or rectangular (0.08 m x 0.08 m (on av.)). The walls consisted of wattles attached to the core of posts, faced with yellow daub, and finished with white-washed plaster. Some fragments (375, 398, 400, 423, 433, 575\587, 2188, 3327, 3394, 3404; 3327, 3394 and 3404 are not illustrated) of the wattle-and-daub walls, 0.23 m (on av.) wide, survived *in situ*. The plaster finish was only recorded in the material recovered from the demolition debris. It is likely that the beamslots supported walls of identical construction as no evidence to the contrary was discerned. At the junction of Post-trench 658 with Beamslot 457 a section of daub wall (542) was deeply emplaced into the post-trench. Another example of a variant in the method of construction was noticed in the charred remnants of the south wall (338). This was built from horizontal timber planks (338) attached to a line of posts (2676) individually driven into the ground. The central post of this wall (351) had been driven into the fills of Pit 627 ascribed to the previous phase. The material used to roof the structure is unknown, but in the absence of other evidence timber shingles are assumed.

TABLE 6: BUILDING 3.10 ROOM DIMENSIONS

Room	Surface	Size (m)	Area (m ²)
A	2224	3.90 x 4.50 min	17.55 min
B	–	1.60 x 4.50 min	7.50 min
C	2085	2.10 x 4.60 min	9.66 min
D	2265	8.90 x 1.80	16.02 min
E	2476\2477	9.10 x 3.10 min	28.21 min
F	–	2.90 x 3.80 min	11.02 min
G	2222	2.50 x 3.90	9.75
H	2223	6.50 x 3.90	25.35
J	2225	4.50 x 3.10	13.95
K	486	min 4.00 x 1.50 min	6.00 min
L	484	1.70 x 4.30	7.31
M	558	c 2.40 x 4.50	10.80
N	488	c 2.40 x 3.70	8.88
P	572\574	5.90 x 3.70	20.65
R	355	12.70 x 3.00	38.10
S	–	1.10 x 24.00	26.40
T	487\489	min 14.50 x c 3.30	47.85
V	482	1.70 x 3.50	5.90
W	3158	4.75 x 6.60 min	31.35 min.
X	3336\3369	4.30 x 3.15 min	13.55
Y	3470	2.40 x 2.60	6.24
Z	3483	min 2.00 x 2.40	4.80 min
AA	3333	2.40 x 2.10	5.04
BB	–	min 1.75 x 2.10	3.68 min
CC	–	min 1.75 x 2.65	4.64 min
DD	3373	4.20 x 3.60	15.10
EE	485\3467	3.70 x 6.00	22.20
FF	3406\3583	1.50 x 4.50	6.75
GG	–	4.70 x 4.70	22.09
HH	3406\3407	c 1.50 x 6.90 min	10.35 min
JJ	354	1.50 x 13.00	19.50

The relative arrangements of the post-trenches and beamslots suggested that the excavated part of the structure was divided into thirty-one internal areas (A – JJ) of varying size (see TABLE 6). Certain of the rooms (A, C, D, G, J, K, L, M, N, Y, Z, AA, EE) were floored with layers (484, 486, 488, 558, 2085, 2222–2226, 485, 3467, 3333, 3470, 3483) of yellow-brown or brown sandy clay interspersed with a small (*c.* 10%) quantity of stone and pebbles. Five rooms (P, R, V, DD, JJ) contained deposits (354, 355, 482, 572, 3373) of grey or grey-brown clay, and in one room (T) both types of material (487, 489) were observed. The surface in P was



PLATE XV. Site 53: Building 3.10 west range during excavation (2 m scales).

repaired with a *c.* 4 m² patch of yellow-brown clay (574). Two rooms (X and FF) were surfaced with an orange-brown clay (3336\3369, 3583). A similar surface (2476\2477) but containing appreciable quantities of small stones and pebbles was observed in Room E. No surfaces were observed in Rooms B, F, S, BB, CC, and GG. Where observed, these layers extended over the filled post-trenches up to the walls.

The overall ground plan is indicative of a *praetorium* with (an) attached annex(es). The rooms were apparently arranged around four foci, E, T, W, and JJ, which presumably served as circulation spaces. E and W were both metalled and were probably courtyards, JJ was a corridor or passageway and T probably either a very long, narrow room or a wide corridor. A double courtyard arrangement like this is unique amongst *praetoria* so far excavated in auxiliary forts, but there is a resemblance in broad terms to the double-courted Tribune's House II recorded at Inchtuthil (Pitts and St Joseph 1985, 131–2).

W may have had a covered walkway (HH) on its north side, the position of which was represented by a solitary post (3461), perhaps an anchor for a roof over the veranda with the other uprights free-standing on the underlying metalling. This walkway appears to have been a continuation of a corridor (FF) and together they, with a further, but offset passageway (V), provided an east–west-lateral access across the building, which linked with the north–south access provided by T and JJ. Another walkway may have existed on the west side of W, its position suggested by a line between the termination of the post-trench on the north side of Z and Post-hole 3461. The surface in W extended south of the northern limit of Room Z. It is reasonable to assume that a further range of rooms did not exist on the south side of the second court, as despite post-medieval disturbances at least the lower parts of any foundation trenches ought to have survived. It might also be presumed that a further range of rooms was located to the east of the two courtyards, but the limited amount of space available (see Phase 13 below p. 174) probably supports an alternative suggestion that the east side of the courtyards, and concomitantly the building, was defined by a plain boundary, which would also have formed the east wall of Rooms A, B, C, and X.

A further corridor or ambulatory (D) ran along the western side of E. A long narrow room or wide ambulatory (C) lay across the northern end of E, but its relationship with D is not clear. A large room (A) lay to the north of C, and was separated from it by a narrow room, possibly an anteroom (B).

There was no obvious link between E and T, but as part of the range between could not be excavated and the position of all the doors was not always clear, access may have been possible from one to the other through the range of rooms (G/H/J) which separated them. On the other side of T, the western range of the building continued alongside JJ (Rooms K, L, M, N, P, V, R). As the surface was the same in both, and as several whole but broken pottery vessels were located in the western part of rooms (T and JJ) adjacent to the east side of Post-trenches 657, 658 where they had evidently fallen, presumably from a shelf, during the demolition of the building (some of these objects lay in an upright position, others upside-down or on their sides), it can be suggested that the two were continuous, the difference in width being caused by the need to fit a wide range of rooms to the south of Courtyard W, which already extended further south than Courtyard E. A short length of trench in which no evidence survived for posts may have separated off the northern end of T, although it was not recognised as a separate room during excavation.

Where rooms lay between two foci, it was not usually possible to determine with which of the two they were associated. Probable doorways can be identified at either end of V, between A and B, between H and T, in the north-west corner of M, and in the south side of C by gaps left between the post-trenches. Similar entrances may also be assumed at the west end of FF, between T and EE, and between D and DD. Others – between T and P, V and R, V and P, N and P, E and D, J and T, FF and HH, Y and AA, FF and EE, FF and GG, and DD and EE – can be proposed on the basis of what appear to be larger than normal gaps between the post-settings. However, the fact that a room could not be entered directly from a particular circulation space does not necessarily mean that it was not dependent upon it. GG is a case in point. Closely-spaced uprights between this room and W show that there was no doorway here,

but as there appears to have been a doorway from the eastern end of the corridor FF, access to this room would almost certainly have been via W.

It is probable that rooms adjoining courtyards drew their light from them, and that rooms on the south, north, and west sides of the building could have been lighted from outside. Other rooms may have been lit through the provision of clerestory windows. This would have been facilitated by the natural ground slope and the artificial terrace.

It is not possible to suggest functions for many of these rooms, and consequently in most cases there is insufficient evidence to indicate whether different functions were allocated to the different areas of the building. The exception is the south-west corner. Room R, which contained a drain around three sides (465–467), *c.* 0.5 m wide and cut to a depth of 0.15 m (on av.), covered by transversely laid timber planks, some of which (390, 399, 468) had survived in a charred condition, may have served as a stable. An isolated stake-hole (352) at the south end of this room may represent the location of a partition. This was separated by the corridor, V, from the middle section of the annex (P, M/N), which if the identification of R as a stable is correct may have been used as quarters for grooms. The three smaller rooms at the north end of the wing were presumably used for storing equipment. The west side of the building was fronted by a veranda (S). This was suggested by the extension *c.* 1 m westwards of the south wall beyond the line of the west walls of Rooms P and R and by a similar displacement to the west part of the west wall (501) of Room(s) N/M, and reinforced by the location of a post-hole (495) in the west end of Trench 632, which had been extended as far west as the trench (631) defining the north side of V. The mid-way shift in the position of the west wall of N/M combined with the fact that the east wall of K and L was similarly displaced westwards implies that M and N were two separate rooms. (The evidence for this partition may have been removed in Phase 14, below p. 169.) At Housesteads (Charlesworth 1975, 37) the stables, as here, formed part of the building. Ritterling (1913, 48) suggested that part (Rooms R and R1, S & S1) of the compound at Hofheim was used to stable the commander's 'personal horses', which perhaps is the most sensible explanation for the arrangements discovered here. Given this, it seems reasonable to suggest that the remainder of the western side of the building may have functioned as service-quarters dependent upon T/JJ, with their own separate entrances at M and V.

Very few of the other rooms have any sort of fittings which can be used to suggest a function. The shortened post-trenches particularly in H (2275), but perhaps also in CC may represent the position of cupboards or as in Room 2 of the earliest commander's house at Oberstimm (Schonberger 1978, 82) access to an upper gallery, or stairs to an upper storey.

Most of the relatively large room GG had sunk into the underlying gravel-extraction pit (3601) cut at the end of Phase 9, and it is possible that evidence for the subdivision of this area was missed during excavation. Two stake-holes discerned close to the south wall of Room EE, a group of five similar features and a small pit (3402) in FF, and two pits (2257, 2258) in Room C are probably best interpreted as relating to the construction or refurbishment of the building. Hearths in J (2227), H (2221), P (573 and 577; 573 is not illustrated) and Z (3486) may also have been associated with the construction/refurbishment of the building; the use of such features during the building's occupation would have presented an obvious fire risk, and that in J would have blocked the entrance between that room and T.

The slots in X (3359\3367, 3361) and DD (3388) are more difficult to interpret. The fill (3360\3368) of 3359 contained a large quantity of cobbles, which had been carefully placed on end. The other layers (3362, 3366) filling these features in X contained patches of dark brown staining, perhaps indicating the presence of collapsed planking and the slot in DD also contained a fragment of a charred plank (3391). These features probably represent the position of cupboards.

The presence of the collapsed planking in R, X, and DD, together with certain areas of burning under the main demolition debris (p. 166), perhaps indicates that the building was floored in timber, and the areas of clay in the rooms are sub-floors.

One further identification which may be suggested is the location of the dining-room(s). The only rooms large enough to take a set of *triclinium* couches were A, H, P, and GG. Of these, H may be ruled out, as its doorway was in the middle of one long wall, showing that the room

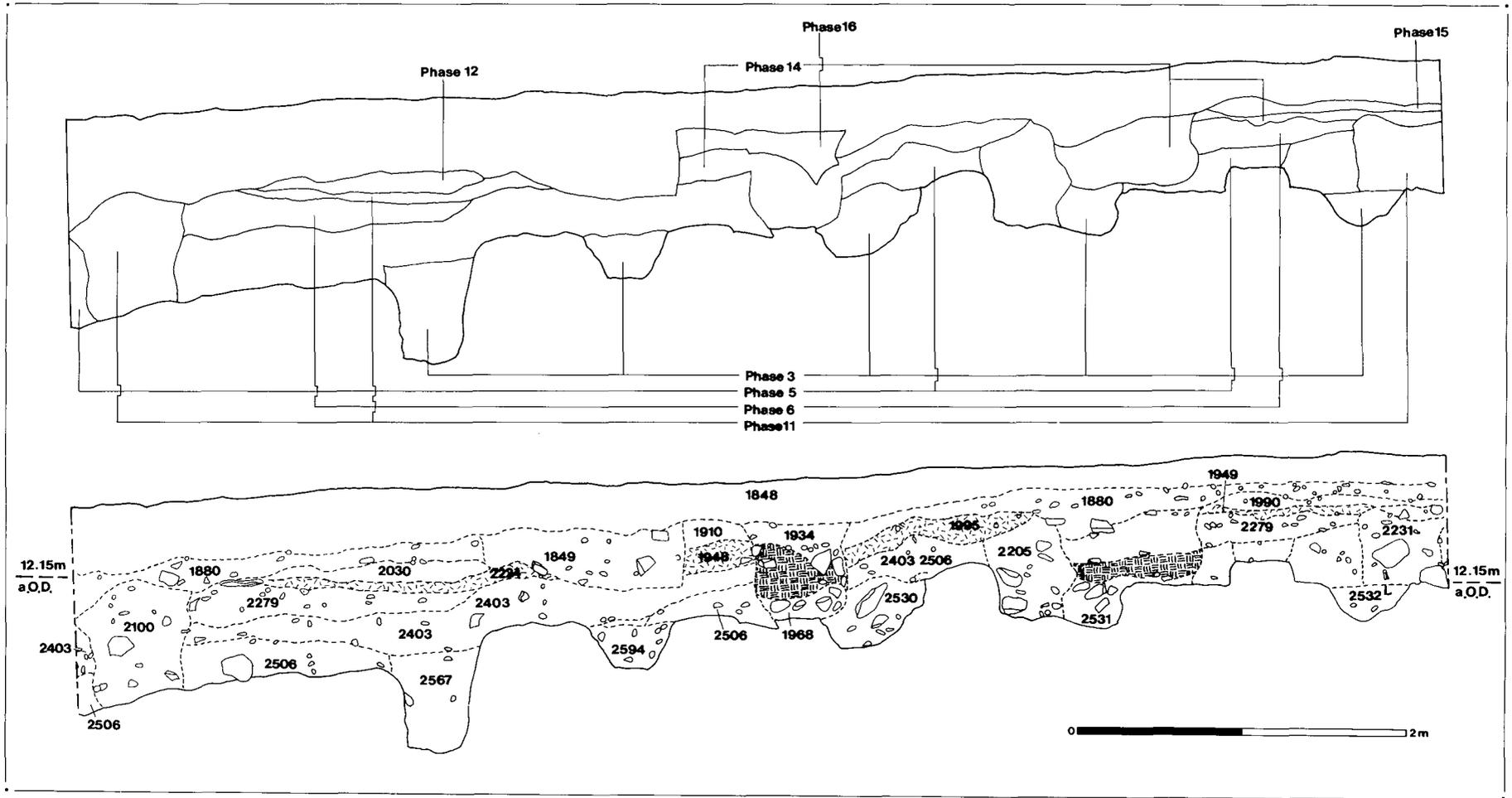


FIG. 73. Site 53: Nos 4 and 6 Dock Street – west-facing section.

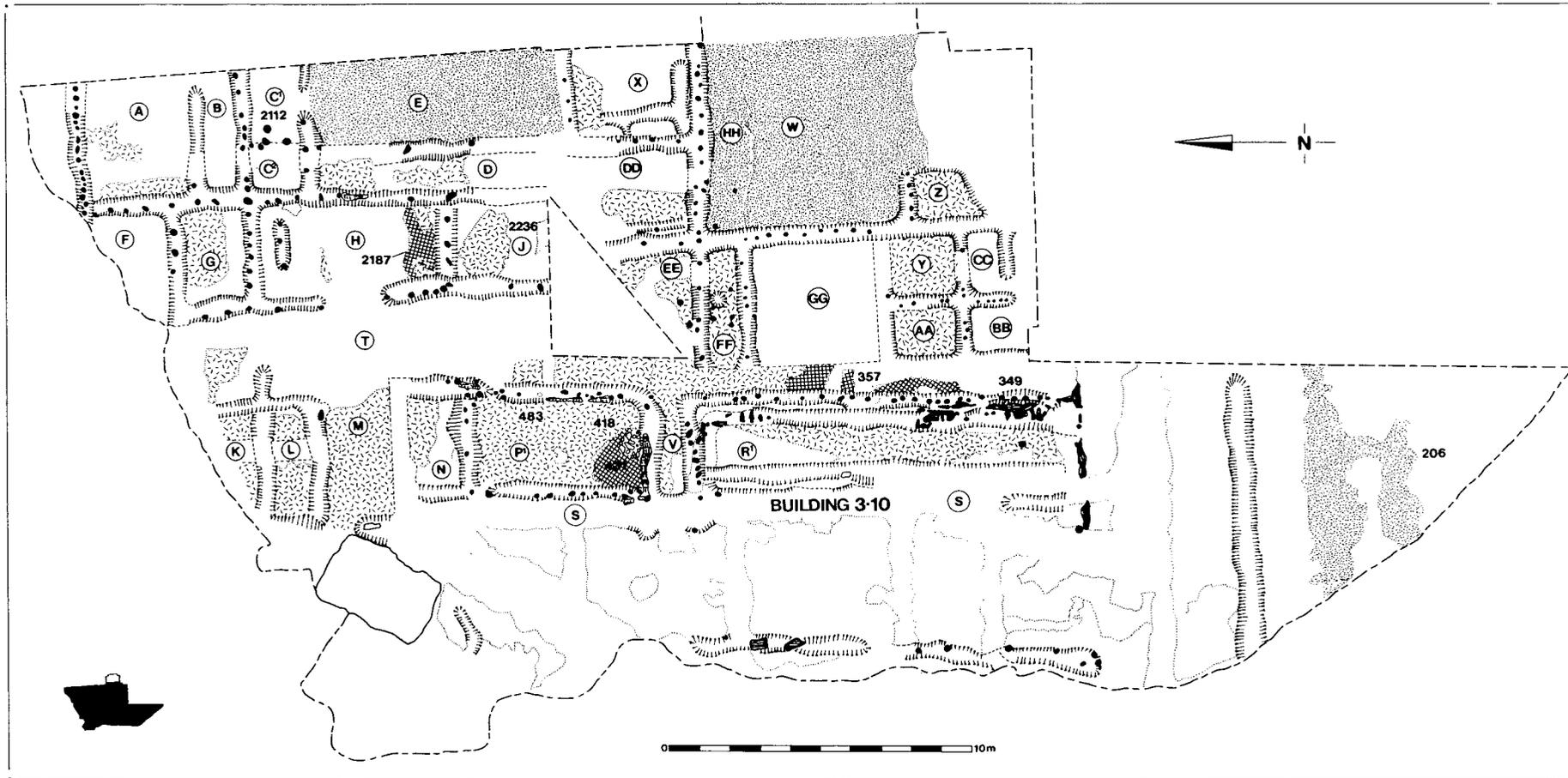


FIG. 74. Site 53: Phase 12.

cannot have been designed to take such couches; and this room apparently opened to a storage area. As the layout of the building suggests that rooms dependent upon JJ may have constituted a service-quarter, it seems unlikely that P would have been a dining-room, and in any case the insertion of the fireplace in Phase 12 (below) would have put a stop to this use as there would no longer have been a suitable place for *triclinium* couches.

Building 3.11

Parts of a second timber structure were recorded *c.* 3.5 m to the west of Building 3.10. It was represented by two features in line with a combined length of *c.* 15.5 m, but separated by a gap of *c.* 1.5 m. A post-trench (516) containing seven circular posts was replaced to the north by a beamslot (515), 0.3 m deep and 0.3 m wide, within which fragments of a burnt beam (507) were recorded. A small area of grey-brown clay (519) was located to the west of the beamslot and may have been the remains of a floor.

The severe truncation of this structure by the nineteenth-century terracing makes accurate assessment of its function difficult. A factor in identifying it as a building is the use of two methods of construction in a similar manner observed in the west annex of the adjacent *praetorium*. The use in particular of the beamslot foundation suggests that the structure is unlikely simply to represent a fence alongside the *via sagularis*, a suggestion supported by the presence of wattle-and-daub in the demolition debris (Phase 12 below p. 166). The size of the building would have been limited by the assumed lines of the western and northern defences. The function of the building is unknown but, given its location, use as a store, stable, or barrack are the most likely options.

Layers 339–341 and Gully 562

The area between Buildings 3.10 and 3.11 was surfaced with dumps (339–341) of clay, stone, and gravel. An isolated gully (562) was located in the area immediately to the south-west of the pill box.

The *via praetoria*

The *via praetoria* was resurfaced with a layer of metalling (345) which extended over the road drain described in Phases 8 and 9, which in turn was replaced (406). It is presumed that the resurfacing and widening of the road, and the cutting of a new drain probably occurred at the same time as the construction of Buildings 10 and 11, but this cannot be proved stratigraphically.

PHASE 12 (FIGS 73, 74, 75)

Phase 12 was represented by the alteration of certain parts of Building 3.10 prior to its demolition.

Building 3.10 refurbishment

Room C was divided (C¹, C²) by the insertion of a line of posts (2200). Each post-hole measured 0.17 m (on av.) diameter and had been cut to a depth of 0.36 m (on av.). In the more easterly of the new areas an isolated stake-hole was recorded. The reason behind this division is unknown. The small size of C² suggests that storage was the most probable use. It is difficult to determine the use of the other half of the division as the full extent of C¹ was not recorded within the confines of the excavation.

The east wall of Room R was crudely shored by the addition of a beam (349\380), which had survived *in situ* as a charred remnant, and a row of slates (358). This perhaps reflects the problems caused by the natural slope of the site and concomitant terracing mirrored by the relative levels of Rooms R and JJ; that of the former (12.41 m–12.33 m OD) was *c.* 0.45 m lower than that of the latter (12.99 m–12.64 m OD).

Room P was reconditioned by the insertion of a new (? sub-floor) surface (483) of pale yellow-brown clay which underlay a hearth (418) constructed next to the south wall. The hearth (FIG. 75) measured 0.81 m by 0.46 m. It consisted of a base (491) of ceramic tiles on which

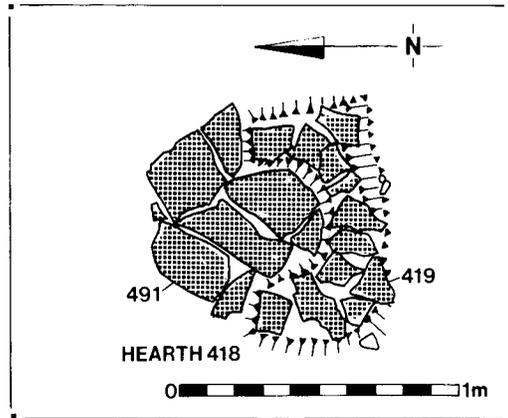


FIG. 75. Site 53: Hearth 418.

was set a semi-circular open-fronted breastwork (419), 0.09 m high, of ceramic tile fragments, loosely bonded with a grey-brown sand, all that remained of a mortar from which the lime had presumably leached out. This wall survived to a height of 0.09 m. The hearth is well paralleled by better preserved examples from Newgate Street in London, some of which survived to a height in excess of 0.5 m (Perring *et al.* 1991, 98, fig. 87).

Buildings 3.10 and 3.11 destruction

Buildings 3.10 and 3.11 underlay a widespread layer of burnt debris [4231]. This was mostly a uniform layer (310\506\2030; FIG. 73 for 2030) of dark greyish brown clay sand which contained a high quantity (95%+) of daub, charcoal, charred wood, and white-washed plaster. The remainder of the demolition debris although essentially part of the same layer contained appreciably less charcoal and more daub and plaster.

It is probable that Buildings 3.10 and 3.11 were destroyed accidentally rather than as a part of a policy of deliberate demolition.³² The evidence for this assumption in the case of Building 3.10 is threefold. Firstly several pottery vessels were located, together with a representation in bronze of a mouse eating a biscuit (Cat. No. 155), in a variety of positions but evenly spaced alongside the walls separating Rooms T and JJ from Rooms R and P. One of these vessels possibly included remnants of food. It is probable that these had fallen from a shelf as the wall

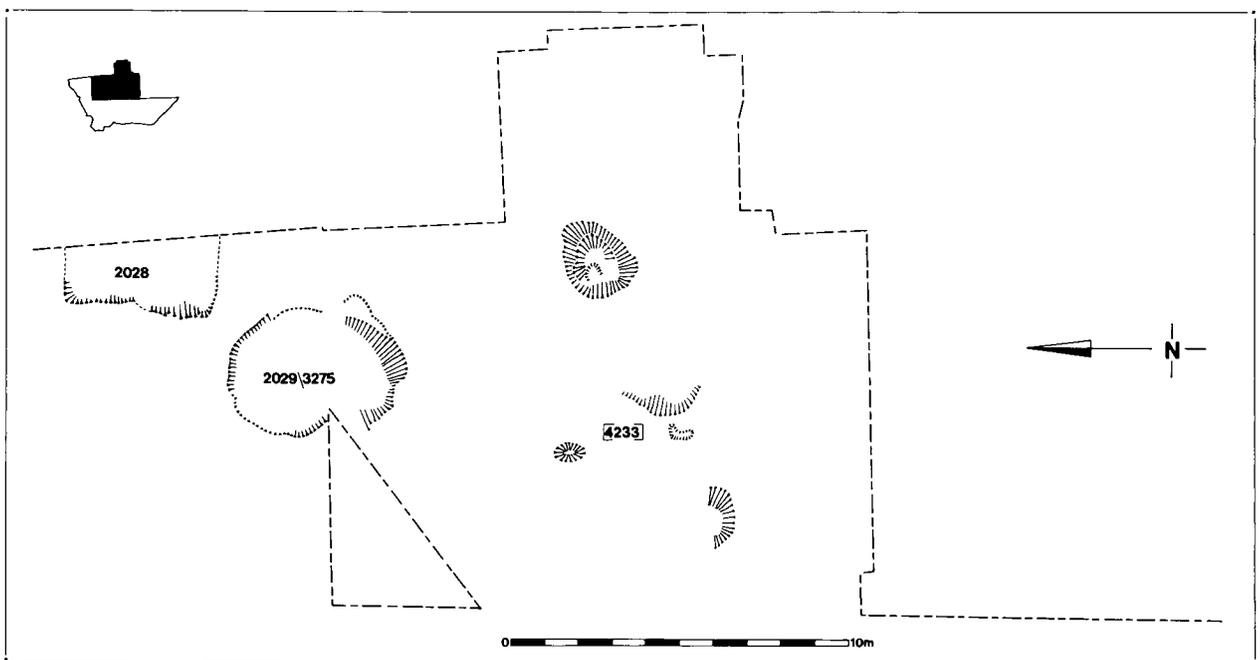


FIG. 76. Site 53: Phase 13.

fell. Secondly another group of finds including iron tools, some knife fragments, bells, a bracket, and some hooks (Cat. Nos – Copper-alloy 159, 169; Iron Nos 4, 22, 25, 33, 38, 48, 60, 61, 113, 114; see Ironwork below p. 274 for a discussion of this group) were found in association with a collapsed shelf (3390) in DD. Thirdly the quantity and variety of finds from within and immediately underneath the demolition debris were considerably higher than from the comparable preceding and succeeding structures, indicating a relatively rapid evacuation of the building. Building 3.11 appeared to have been destroyed in an identical manner, and it would have been relatively easy for the fire to spread from Building 3.10 to Building 3.11 or vice-versa.

Although much of the superstructural fabric was preserved within the demolition debris, these deposits had been levelled off and in the course of this mixed up. It was therefore not possible to identify particular areas of collapsed walling, other than a distinct layer (2034) of yellow clay flecked with burning in T and similar deposits recorded in Rooms Y, Z, AA, and BB sealed by layers of mixed clay and unburnt daub [4230] (not illustrated). Eleven areas of burnt timber located under the main part of the demolition debris may have represented the remains of collapsed ceilings or more probably timber floors (only four of these areas 348, 357, 431 & 2187 are recorded on plan; FIG. 74). The weight of the destruction debris resulted in the collapse of the superstructure of the hearths in P and J, and may have forced the planks in Room R into the base of the drains here, unless this occurred as a result of subsequent slumping.

The *via praetoria*

The road drain was filled in (344 & 642; FIG. 81).

DATING: PHASES 10–12

The only numismatic evidence comes from Phase 11 – four coins (Cat. Nos 35, 37, 49 & 50), two issues of Domitian, two issues of Nerva. The coarse pottery and samian, although containing considerable quantities of residual material, however, support a Trajanic occupation of Buildings 10 and 11. A date range for these phases of 100\105 to 105\110 is suggested.

PHASE 13 (FIGS 73, 76)

Following the levelling of the demolition debris from Buildings 3.10 and 3.11, a number of pits were excavated.

Pits 337 (not illustrated), 2028, 2029\3275 and [4233]

Three very large pits and ten smaller but similar features [4223] (five of these were not recorded on plan) were cut in the central and south-eastern parts of the site. Two of the three very large feature were sub-circular in shape, and contained layers of redeposited demolition debris [4234]. The more easterly and larger, 5.4 m by 3.5 m, example 2029\3275 was capped with a layer of pebbles and mortar set in clay (2015). This feature was excavated to a depth of *c.* 1.8 m, but safety reasons restricted further work. The third pit, which was rectangular in shape and measured 6 m by 1.5 m (minimum) by 0.7 m, contained seven deposits [4235] of clay and rubble (see FIG. 73).

The other pits were located in the south-eastern quarter of the site. They were all roughly circular in shape; the largest measured 3.2 m by 2.3 m by 0.44 m, the smallest 0.78 m by 0.5 m by 0.22 m. Three of the pits contained layers [4236] of redeposited demolition debris derived from the destruction of the underlying building. Four other pits contained layers [4237] of dark greyish brown silt loam and three were filled with layers [4238] which contained appreciable quantities of plaster, mortar, and other building debris.

Most of the pits were presumably cut to extract sand and gravel and subsequently accommodated unwanted debris. However the large rectangular example and four of the pits in the south-eastern part of the site, which all contained quantities of building debris, may have been associated with the construction of Building 3.12 (below).

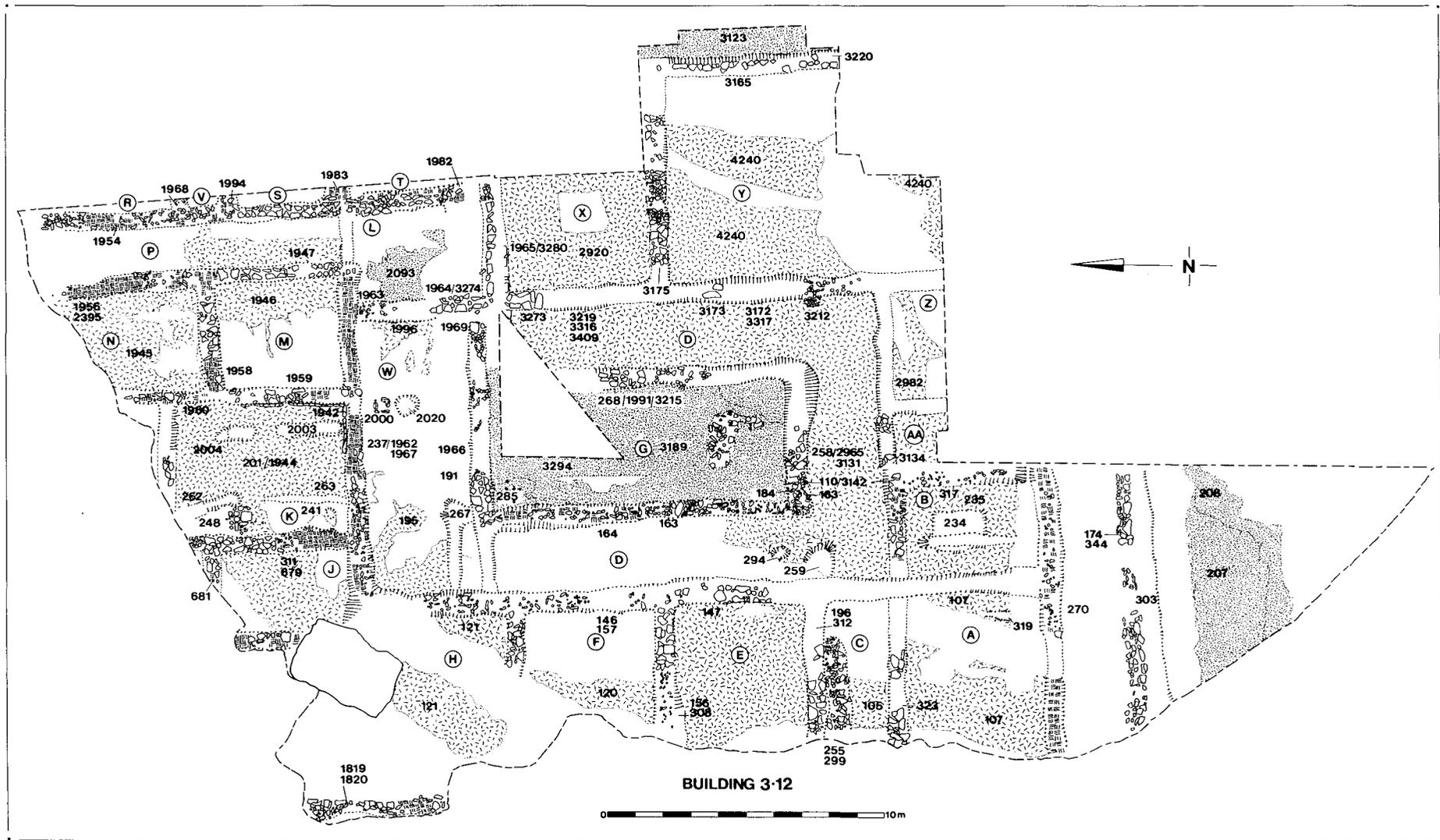


FIG. 77. Site 53: Phase 14.

PHASE 14 (FIGS 59, 73, 77, 80, 81)

This phase was represented by the construction of a large building (3.12) occupying almost the whole site and extending beyond it to the east, west, and north, and the resurfacing of the *via praetoria*. Building 3.12, like its predecessor, is interpreted as a *praetorium*.

Levelling material

The *praetorium* was only constructed after deliberate clearance and levelling operations. This was indicated in part by the activity denoted in Phase 13; it was also apparent that much of the debris from Building 3.10 had been moved downslope to the west of the terrace where it rested to a depth of up to 0.5 m. Other parts of the site were levelled with dumps of clay and building debris [4239; FIG. 81 for 079]. The effect of this activity was to create roughly terraced platforms, which counteracted the steep drop of the natural slope.

Building 3.12

The *praetorium* was presumably sited at this end of the fort for the same, mainly topographical, reasons as its predecessors. However, before we discuss our reasons for this interpretation and also the purpose and use of certain rooms, it will be necessary to evaluate certain matters related to the surviving structural remains.

The overall dimensions of the building could not be fully ascertained as it extended beyond the northern limits of the excavation area, and in part also the eastern and western limits, but it encompassed an area of at least 1008 m² (36 m x 28 m). In terms of Roman dimensions this gives a building measuring at least 125 pM by 95 pM.

Building 3.12 was represented by thirty-two foundation trenches cut either east–west or south–north. Each of these features measured 0.6 m (on av.) in width and 0.47 m (on av.) in depth. Fair-faced walls composed of randomly-coursed, mortar-bonded sandstone masonry overlay a variety of foundation materials deposited in the bottom of the trenches. These walls were 0.54 m (on av.) wide. In most examples the lowest two wall courses were set within the foundation trenches. One of the features had survived to a height in excess of 0.4 m; however most were considerably less well preserved. Where three walls (1964\3280, 1965\3274, 3273) overlay one of the pits (2029) cut in the previous phase, the foundation trenches had been cut down into that feature to a depth of at least 1.5 m and filled with properly dressed and mortared masonry. Another example (163) (between Rooms D and G) differed in construction; it was represented by unmortared sandstone slabs pitched at an angle of about 10 degrees from vertical. All of the other walls were bonded utilising a mortar with a high sand content.

Traces of painted plaster (1942, 1950, 1989) were discerned facing at least three of the walls, the best preserved section was in Room K, and other decorated plaster was recovered from the demolition debris (see Phase 15). The wall plaster (see Plaster report Nos 10–13 below p. 188 for full details) was of a particularly high standard, with a surface painted white but decorated in floral or abstract patterns using orange, green, yellow, black, red, and brown. The recovery of several fragments of *tegulae* and *imbrices* from the demolition debris indicates that the building is likely to have been roofed with ceramic tile (*pace* comments in the tile report). It is possible that the plasterwork and other structural embellishments were undertaken prior to the insertion of the clay sub-floors (see below p. 171) as these sealed a number of pits (described in Phase 13) which contained building debris.

As most of these walls had been truncated by later activity, it was difficult to ascertain whether the masonry was levelled off after a few courses to give way to a timber or mud-brick superstructure or continued in stone throughout. The latter is the more likely given the width of the walls (see Evans *et al.* 1985, 88 n. 40), and the deliberate strengthening of the foundations in the lowest parts of the site and in particular the use of mortared pebbles (below). It was also apparent that as the walls were plastered to sub-floor level, if half-timbering had been preferred it would have been necessary to go to the additional trouble of ensuring that the timber part of the superstructure was plane with the stone courses, and also that any clay fill, or mud brick, if this had been the preferred medium as it would have been easier to fashion than a 0.5 m wide

timber framework, was well keyed in order to ensure that the plasterwork could be added with the minimum amount of effort.

Four different types of foundation material were utilised in six combinations (see FIGS 59, 73, 80 for 237, 270, 681, 1968, 1983, 1994). The majority of the walls were supported on a single layer (164, 237\1962\1967, 270, 304\3297, 681, 1954, 1956, 1968, 1982, 1983, 3220) of cobbles and stones encased in a pale brown or grey gleyed clay. This, the weakest foundation material used, was mainly located in the highest part of the building. Three of the westernmost foundation trenches not only contained similar deposits (308, 312, 1820) but also had an upper foundation of small stones and pebbles loosely bonded with a sandy mortar (156, 196, 1819). Another trench in this part of the site (323) held just the wall. The foundations (1958, 1960) of two trenches located in the north-eastern quarter of the site consisted of a mixture of the two types of material described so far. A third group (184, 317, 1963, 1966, 3172\3212\3317, 3175, 3219, 3316, 3409) occurred in the central part of the building and consisted of unbonded small cobbles, stones, masonry fragments, brick, and tile. Within the longest trench this matrix of loose components (146) was set above mortared stones and pebbles (157). Lastly, two of the northernmost walls rested on a double foundation of cobble and stone bonded in clay (311, 1956) above pebbles and sand (679, 2395).

Six walls (110\3142, 157, 163, 191\1969, 1959, 3173 and 3273) also served to retain the edges of the terraced platforms (see above). The difference in floor level on either side of these walls was c. 0.25 m.

The relative arrangements of the foundation trenches and surviving walls suggested a single building arranged into at least twenty-three rooms (A – AA). Two examples (L and G) contained metalled surfaces (2093, 3294 respectively), the others brown or yellow-brown sandy clay (098\103, 105, 107, 120, 121, 126, 195\1998, 201\1944, 242, 258\2965\3131, 268\1991\3215, 1945–1949, 1984, 1995, 2920, 2982, 3134, 4240; FIGS 59, 73).

TABLE 7: BUILDING 3.12 TABULATION OF ROOM DIMENSIONS

<i>Room</i>	<i>Surface</i>	<i>Size (m)</i>	<i>Area (m²)</i>
A	107	4.80 x 6.00 min	28.80 min
B	242	3.50 x 4.70	16.45
C	105	2.40 x 5.50 min	13.20 min
D	258\2965\ 3131	Not calculated	91.92
E	098\103	4.90 x 6.00 min	29.40 min
F	120	4.70 x 4.50 min	21.15 min
G	268\1991 3215	10.70 x 4.50	48.15
H	121	min 8.20 x 6.90	56.58 min
J	126	4.70 x 3.10	14.57
K	201\1994	6.40 x 4.90	31.36
L	2093	4.70 x 3.50	16.45
M	1946	4.20 x 4.50	18.90
N	1945	min 5.20 x 4.20	20.80 min
P	1947	min 10.50 x 1.90	19.95 min
R	1948	4.50 x 0.30 min	1.35 min
S	1949	3.60 x 0.40 min	1.44 min
T	1984	4.45 x 0.40 min	1.78 min
V	1995	1.90 x 0.30 min	0.57 min
W	195\1998	3.90 x 10.60	41.34
X	2920	5.60 x 4.30 min	24.08 min
Y	4240	min 10.00 x 8.10	81.00 min
Z	2982	min 1.90 x 4.30	8.82 min
AA	3134	min 1.90 x 2.30	4.73 min

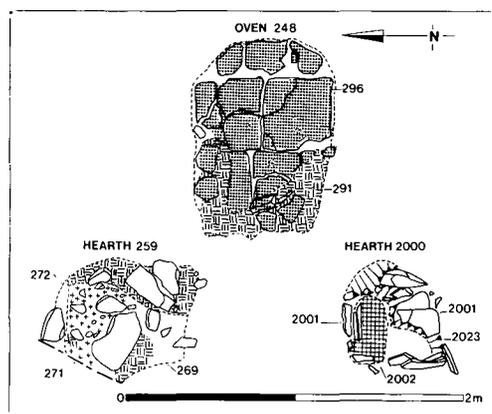


FIG. 78. Site 53: Hearths 259, 2000; Oven 248.

Features above or cut through the sub-floors were discerned in Rooms A, B, C, D, G, K, and W. These can be divided into two groups – those connected with the construction of the building, and those with its use.

In the first group are a number of hearths and adjacent ash-pits located in Rooms A, B, D, K, and W, a square shallow pit and slot in B, a shallow depression in K, and a group [285] of stake-holes in G. Two of the hearths were represented by burnt patches (319, 235) respectively in Rooms A and B. Further examples in D and W (259, 2000; FIG. 78) were set next to small ash-pits (294, 2020). These features were both too poorly-constructed to have had any extensive use or were sited, as was the case with the examples in D and W, so that access through rooms would have been restricted. The best-preserved example was recorded in the north-west corner of K (248 FIG. 78). The base (296) was formed from ceramic tiles set on clay (297) placed in a shallow (0.1 m) sub-circular depression (334). A semicircular arrangement of broken tiles and grey clay (291) overlay the west end of the tile base and survived to a height of 0.15 m. The position of this feature next to a partition (see below) would have hindered its use once the building was completed. Given their position and construction these hearths are best seen as temporary features associated with the activities of builders (see Evans *et al.* 1985, 74). A shallow (0.08 m) sub-circular depression (241) of uncertain purpose was located *c.* 2.5 m to the south of 248. Other features perhaps associated with the activities of the builders were: six stake-holes [285] in the north-west corner of G, subsequently sealed by a dump of clay (224); and a sunken rectangular feature in the centre of B (234), cut to a depth of *c.* 0.1 m, the west side of which was extended southwards and northwards to form a slot which contained a horizontally-laid slate slab under a burnt clay sand layer (228), which also filled 234.

In the second group are slots in C, K, and W and a spread of masonry fragments in G; these features are described further in the following discussion of the plan and internal arrangements of Building 3.12.

The core of the building was the central block of rooms (B, AA, Z, D, G, W, J, K, M). Rooms B, AA, Z, D, G, and W occupied a rectangular block measuring 26 m by 12 m: the outer sides of J and M projected by 1.4 m on either side and the north wall of K projected by 7 m at the back. The main axis ran south–north through the middle of AA, G, W, and K, dividing this central block into almost symmetrical halves; J/K/M was displaced slightly since M was larger than J. This axis also ran through Feature 3198 (below) at the southern end of G.

A close examination of the plan reflects the careful and deliberate design with well-proportioned units, whatever the measurement system used (Evans 1994). The core block (D, G, W) has a length:breadth ratio of 3:2. The breadth (east–west axis) of the rooms in the west wing (A, C, E, F, H) has a ratio of 2:3 to the breadth of the central block. The length of these rooms is the same as the breadth of G, except C, which is half the size of the unit employed. The combined breadth of Rooms J, K, and M has a ratio of 5:4 to the central block; J and M are the same depth (north–south) as W, K is a third as long again. B, AA, and Z have the same breadth as the central block and a length ratio to it of 1:3. Y has a breadth ratio of 3:4 with the

central block. Other areas also appear to have been laid out to equally well defined proportions.

This plan displays a number of features typical of Roman domestic architecture, which enables certain deductions to be made about how some of the rooms were conceived and used. First of these is the fact that the central area of the building is probably a courtyard (G) surrounded on three sides by an ambulatory (D). Second is the axial arrangement of the rooms with slight adjustment made to avoid mirror symmetry. Third is the suite of three rooms (J, K, M) facing what is probably the main entrance from the *via praetoria* (AA), a feature which occurs widely in Roman-period houses in the western Mediterranean area (Tamm 1973, 60).

Its position at the end of the axis allows us to identify K as one of the principal rooms, designed as an 'audience room' (Wallace-Hadrill 1988, 90). It was probably visible from the main entrance, with its doorway occupying most of the south side. Two pairs of parallel slots (262, 263 and 2003, 2004) perhaps represent the position of plastered stud partitions. Each pair of slots was separated by a *c.* 0.5 m wide gap and in both cases the full extent of the more northerly examples could not be recorded because of subsequent truncation. The most uniform, in terms of shape, of the slots (263) was 0.15 m wide and cut 0.05 m deep, the others averaged 0.45 m in width and were cut to a depth of 0.14 m (on av.). 263 is the most likely to represent a partition, and if so was probably for a walk-in cupboard attached to this important room as in the House of Menander at Pompeii (Maiuri 1933). A partition here would also have meant that the door cannot have extended the full width of the room, but it should be noted that the axis runs not through the exact centre of K, but through the centre of that area of the room north of the partition. The door was therefore also probably offset so that it lay exactly on the axis. This interpretation of K also has implications for W. Since K was probably designed to be visible from the main entrance, the south wall of W must, therefore, have been 'transparent', with columns or a large window or windows on the area overlooking G. The relationship between D and W is uncertain. The logic of the plan demands that W should be accessible from D but the presence of foundations between D and W shows that the transition from one to the other would have been marked by at least a threshold.³³ There is certainly no impediment to such an arrangement at the eastern side, but the presence of a clay capped slot (267) in the south-west corner, which stood proud (to *c.* 0.4 m) of the surrounding floor surface and measured 0.35 m (on av.) in width and 3.40 m by 1.10 m in length, would seem to have precluded passage from D to W at the west. One further point should be made about the main axis. The stone feature in G (3198) which lies directly on it may have been intended as the base for a statue designed to add further emphasis.

The metalled floor of Room L which lies to the east of W suggests that it may have been open to the sky. In this case it may have served as a light-well to the corridor P and the surrounding rooms T and X. Rooms B and Z on either side of the main entrance could have been lighted from either the courtyard, or from the *via praetoria* though any windows high enough up the wall to prevent outsiders from looking in. The disturbance towards the south-east corner of the site makes it impossible to determine the arrangements here. Z may have continued along the façade to occupy the north-east corner of the house, Y may have extended into this area, or there may have been a third room accessible from one or other and lighted from the street. Although the rooms of the west range probably drew at least some of their light from the courtyard too, their position would also have given them the option of windows in the west side of the building taking advantage of the splendid sea views. Given the natural ground slope and the likely height of the fort walls (above p. 44), the defences would not have obscured such views.

The rooms north of J/K/M and east of the corridor P are too fragmentary to allow for any meaningful discussion, though from its width V was probably another corridor. This leaves the rooms of the north range, X and Y. Y is probably to be seen as a *triclinium* commensurate with the size and splendour of the house. As has been mentioned above, Y may have extended as far as the building's façade, or have finished at the south on a line with the wall between D and Z. We prefer the latter, as the room would then have faced west, the preferred position for winter *triclinia*,³⁴ which is the season in which the commander could be expecting to use his dining-room at base. We suspect, however, that any opening to the courtyard would frequently have had to

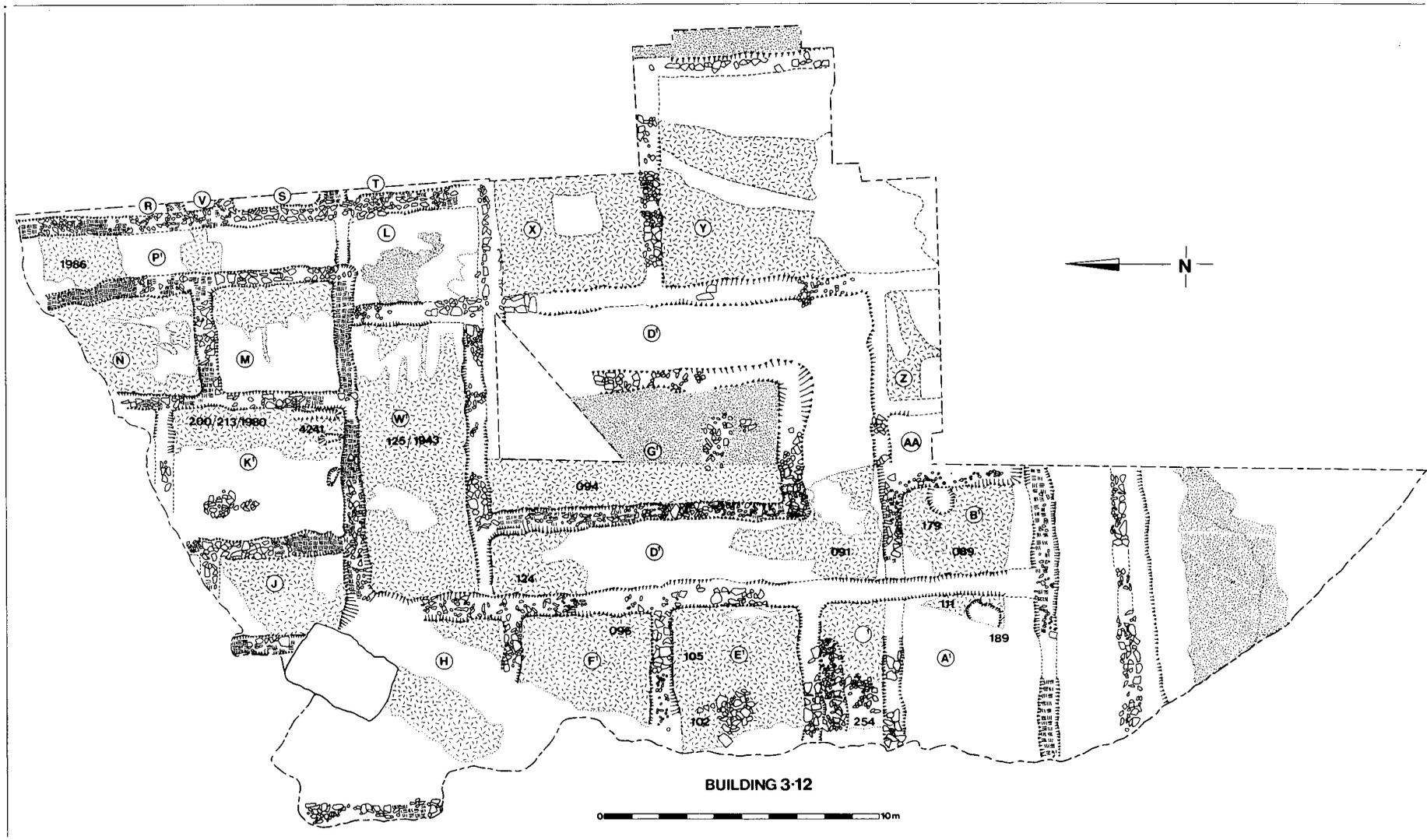


FIG. 79. Site 53: Phase 15.

be shuttered, although in fine weather this orientation would have been pleasant in all seasons except during a heat-wave. The adjoining room (X) may have had an additional attraction in a window to the possible light-well L, and may have been interconnected with Y to form a suite (Wallace-Hadrill 1988, 93–4). A rubble-filled (255) shallow (0.07 m) slot (299) cut alongside the north wall of Room C perhaps represents the position of either a bench or stairway to an upper storey, or altar foundations, or a raised hearth.

Some comments must be made on the flooring of the rooms. After the walls had been plastered, all the excavated rooms apart from L were finished carefully with a layer of clay on the floor. This was renewed in the following phase for Rooms A, B, C, D, F, G, K, P, and W (see below). The incongruity between the quality of the wall-plaster and this cheapest of all floor materials is startling. We believe, however, that this apparent contradiction can be resolved if the clay is seen not as the final floor surface, but as the bedding for a form of flooring which was removed when the building was demolished. We suggest, therefore, that a demountable floor had been set in clay, which would have held it firmly but allowed it to be removed when necessary. The fact that traces of such flooring have not survived should not cause much surprise.³⁵ As the lifespan of the building was not particularly long (below p. 177), the chance of accidental damage or wear and tear making the reuse of the floor unviable would have been much reduced. A final factor in favour of the demountable floor hypothesis is that the clay layers in the rooms were remarkably clean, a feature not to be expected if they had been continually walked over.

Roads (FIG. 81)

The *via praetoria* surface ascribed to Phase 12 was replaced by a layer (207) of very densely compacted stones and pebbles. This metalling overlay a cobbled ‘make-up’ (208). The drain which fronted the earlier road surface was recut (303) to a width of 0.8 m and a depth of 0.5 m; this feature may have been timber-lined; however the evidence for this (1814) was only recorded in section. The north side of the new drain was fronted by a wall (174) of mortared sandstone blocks and slabs which rested on foundations (344) of masonry fragments bonded with clay. These foundations had partially filled the earlier drain.

A small section of a thoroughfare lay immediately outside the eastern exterior wall (3165) of the *praetorium*. It consisted of a well compacted surface (3123) of small stones and pebbles set over a cobble and pebble make-up (3311, 3314). Within the probable layout of the fort (see below p. 218), this road would have separated the buildings in the *latera praetorii* from those in the *retentura*. If so, then the position of this division is likely to have remained little changed during the occupation of this part of the fort. However, this could not be substantiated by full excavation as the road had been partly truncated by the western ditch of the reduced fort (Chapter 2 above p. 82).

PHASE 15 (FIG. 79)

Phase 15 was represented by alterations to certain of the rooms in Building 3.12, which was subsequently demolished.

Building 3.12 refurbishment

It was apparent, during the excavation of the *praetorium* that, although none of the principal structural elements were modified, certain of the rooms were refurbished. The modifications to certain of the internal arrangements of the *praetorium* may reflect a change of occupier, certainly not a change of function.

New sub-floors (089, 091\124, 094, 096, 111, 125\1943, 200\213\1980, 1986) yellow or grey-brown in colour were laid in Rooms A¹, B¹, C¹, D¹, F¹, G¹, K¹, P¹, and W¹. Each of these layers had an appreciably higher content of stone than was apparent in the earlier surfaces. In two rooms (B¹, D¹) the sub-floors were laid over rubble make-up deposits (112 and 093 respectively); the second surface in D¹ underlay a layer (090) of small masonry chippings and stones recorded in the south-eastern corner of the room.

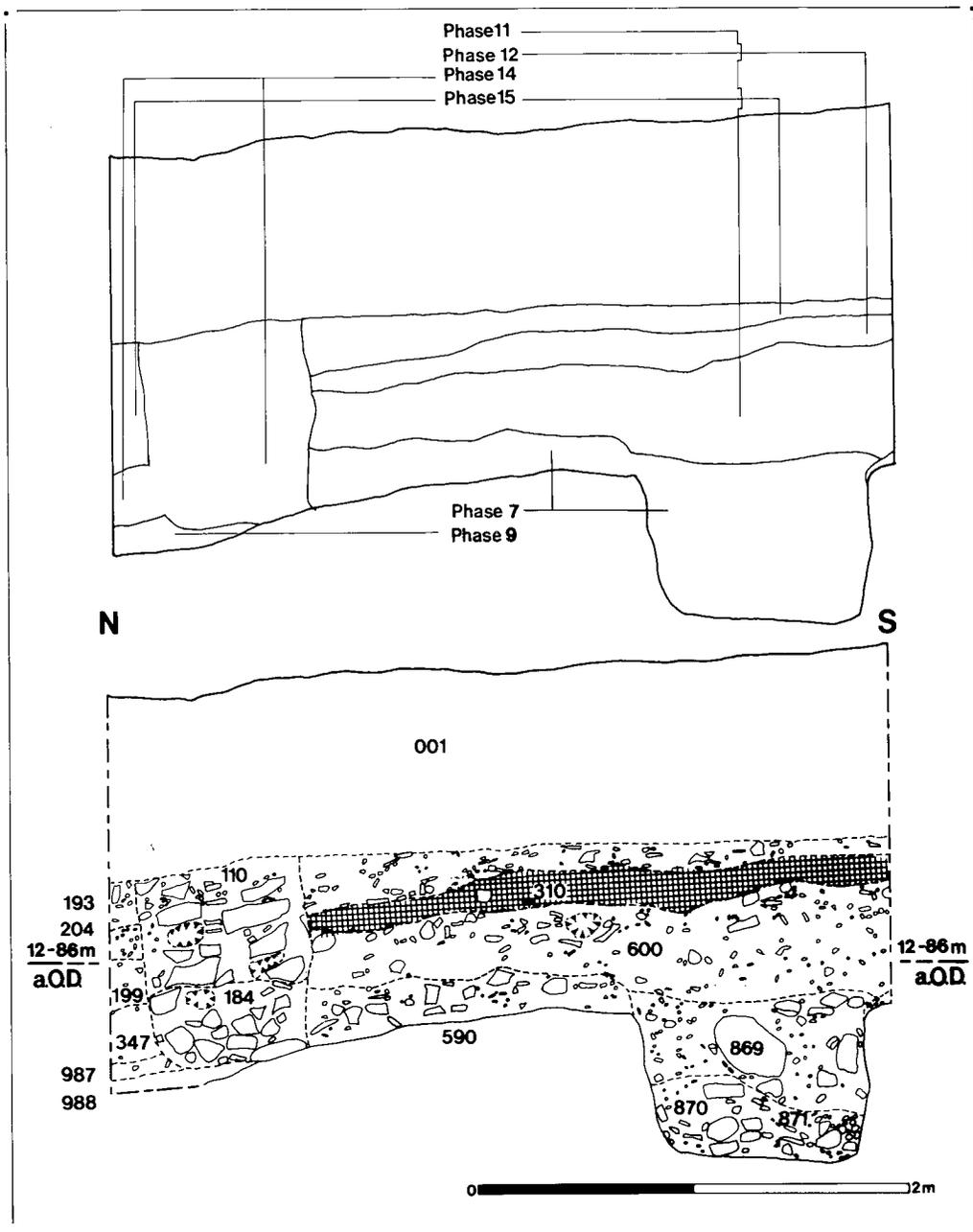


FIG. 80. Site 53: Upper Station House: west-facing section – central section.

It is, of course, possible that some of these surfaces were part of the original construction, and were laid as a result of the need to provide additional levelling material in certain parts of the building so that access from one room to another was eased. In G^1 and L^1 , however, settlement into earlier features (994\3601 Phase 9, 2029\3275 Phase 13 respectively) may have dictated the need to refloor these areas after laying down additional levelling material (192, 193, 199, 204, and 1952 respectively) as a result. The new sub-floors in A^1 and B^1 underlay simple hearths (189, 179 respectively), probably the product of the workmen's activity.

In K^1 and W^1 , the internal arrangements were altered. The various earlier elements of K , which were sealed by areas of mortar (265, 266) and other building debris including plaster (217, 239; FIG. 59) and other debris (249, 250, 264), were dismantled and the walls replastered and repointed prior to the laying of the new surface. Six scoops (4241, three not recorded on plan) which cut the new surface in K^1 are difficult to interpret but may reflect the location of shelving or furniture. In W access from D may have been improved by the demolition of the bench/shelving in the south-west corner.

Pads of rubble were inserted into Rooms C^1 and E^1 (254, 102 respectively), each encom-

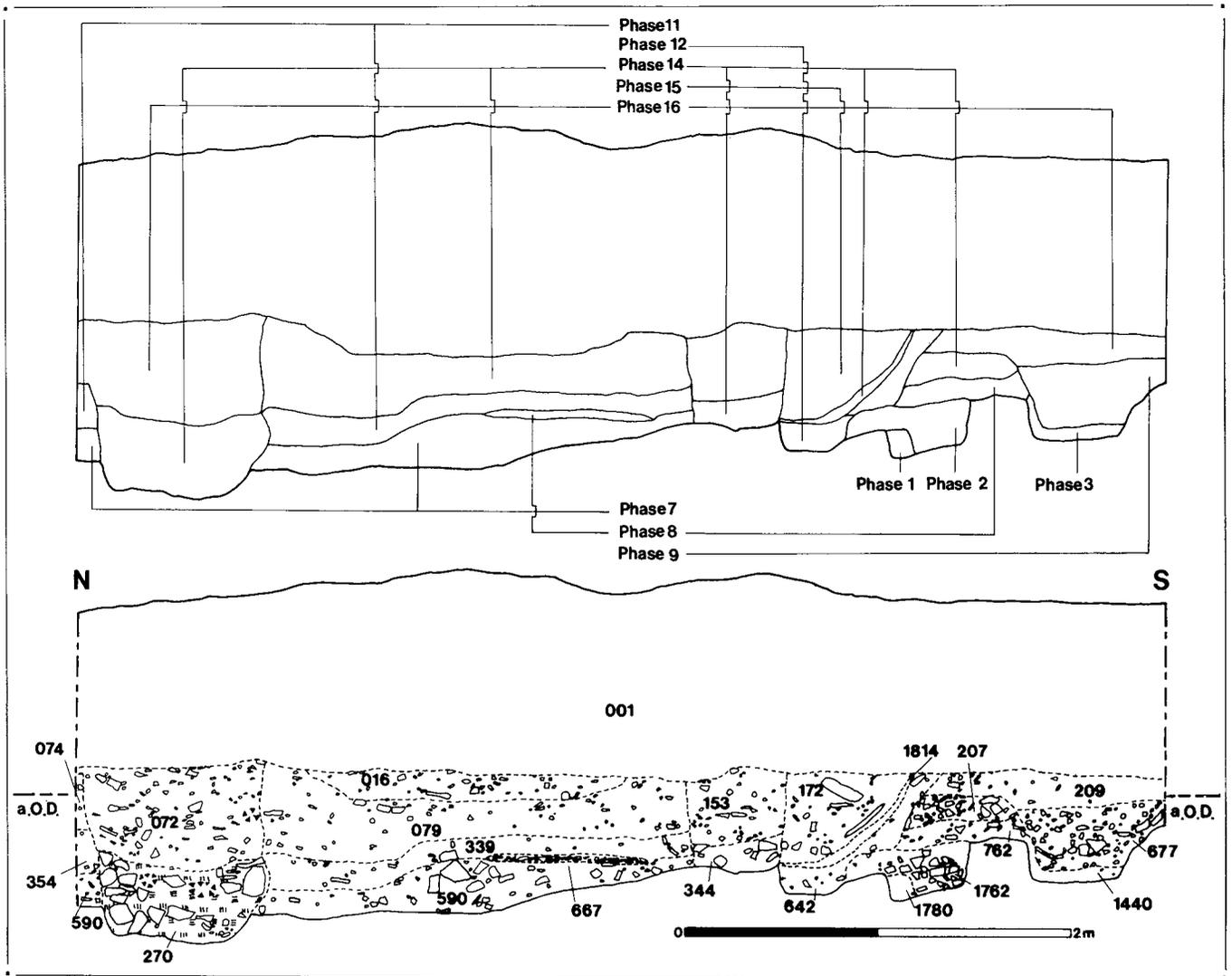


FIG. 81. Site 53: Upper Station House: west-facing section – south end.

passing an area in excess of 2.5 m². These did not have any apparent structural function, unless they were required to support a sagging roof or ceiling, and since all the other rooms were carefully refurbished it seems unlikely that these two would have been allowed to remain with props in the middle of the floors. An alternative interpretation of 102 in Room E¹ is that it may possibly be the base for either a statue or perhaps a *lararium*, as discussed by Boon (1983).

Building 3.12 demolition method

The secondary, and some of the primary surfaces, underlay deposits [4243; FIGS 59, 73 for 194, 1910, 1990) of collapsed plaster, masonry debris, and occasional pieces of tile spread over most of the site.

Despite the fact that much of the demolition debris had been removed from the site (probably in Phase 16 see below p. 184), the absence of daub or charred timber lends weight to the argument that the building was entirely constructed of stone with a roof of ceramic tiles or possibly timber shingles. In either case at least the upper part of the building must have been dismantled rather than being allowed to decay.

Roads

The *via praetoria* surface laid down in Phase 14 continued in use. At the end of the phase the

via praetoria drain was filled with a layer (172; FIG. 81) of clay and demolished masonry. The interval road was resurfaced with a layer (3310) of cobbles set in clay.

DATING EVIDENCE: PHASES 13–15

The numismatic material consists of Flavian issues (Cat. Nos 11, 19, 24, 41, 52). The coarse pottery and samian again contain considerable quantities of residual material but sufficient later forms to suggest an early to mid-Trajanic date. A date range for the occupation of Building 3.12 of 105\110 to 110\115 is suggested.

THE PRAETORIA: A DISCUSSION (FIG. 82) By E. M. Evans and A. G. Marvell

Introduction

Buildings 3.10, 3.12, and, on the weight of evidence, probably also 3.7 and 3.9 (more certainly in its first phase of use) are four examples of a type of structure commonly identified as being primarily the residence of the unit commander in the permanent stations of the Roman army. Excavations before the Second World War in Britain, Germany, and Austria exposed the outline plans of several stone *praetoria*, but it is only more recently that the full plans of timber examples have been recovered on a regular basis, through open-area examination rather than by cross-trenching. This has led to the recovery of far more detailed information about the plan, layout, design, construction, and use of these buildings and their component parts.

The majority of *praetoria* in auxiliary forts are timber or stone constructed buildings consisting of a central courtyard with four surrounding ranges of rooms, a style of building familiar from the peristyle houses of the Mediterranean (Webster, G. 1969, 191; von Petrikovits 1975, 145).³⁶ In its simplest form, as at Gelligaer and Birrens (Antonine 1), the overall ground plan of the *praetorium* consists of a central courtyard and surrounding veranda enclosed by four ranges of rooms. This format can be seen on a larger scale at Housesteads, Balmuildy, Oberstimm (Period 1b), and in our Building 3.12. To this basic plan annexes were sometimes attached. These may be represented by yards or compounds as for example at Rottweil (Planck 1975, 66–70), Hofheim (Ritterling 1913, 46–52), or Pen Llystyn (Hogg 1968, 130–2), although in some instances a more specific use can be detected, as with the stable wing in our Building 3.10.

However, although the *praetorium* with an enclosed central courtyard is the commonest, it is by no means the only type of layout employed. A cursory survey of buildings identified as *praetoria* in other forts suggests the presence of a wide range of building types (FIG. 82). An aisled commander's house was found at Templeborough (May 1922, 36–8). This particular building had a courtyard to one side, a feature also to be found in two other *praetoria*, the final 'Lunt' (Praetorium II) and Oberstimm (Period 1c) buildings.³⁷ At Wiesbaden the *praetorium* consisted of an entrance group of rooms flanked by two further ranges of rooms (Ritterling 1909, 28–30).³⁸ A possible three-sided *praetorium* of later date was excavated at Castell Collen (Evelyn-White 1914, 23–35); and a broadly similar arrangement can perhaps also be seen in the *praetorium* at Nanstallon, Cornwall (Fox & Ravenhill 1972, 75–9). A key observation from these variations in plan must be that the accommodation provided was one that was commensurate with status.³⁹

Whilst the fact that these buildings were the residence of the garrison commander and were derived from Mediterranean building types, however unsuitable for a North European climate, has long been recognised, various attempts to interpret the use of component parts have been misguided (e.g. Charlesworth 1975; Richmond & Macintyre 1938–9; Fox & Ravenhill 1972; Johnson 1983a and b; Schonberger 1978; Webster, G. 1969, 198), since they are based on a rather naive concept of how the commander's residence would have functioned in the running of the fort. There is no literary evidence for *praetoria*: this should cause no surprise, since the audience would automatically know the types of dwelling used by Roman military commanders. Similarly no epigraphic evidence is available; and the archaeological/architectural evidence has never been used to the best advantage. The assumption that these buildings had additional or different uses to those of other Roman domestic dwellings, despite the absence of evidence to support such assertions, has led to much ill-informed speculation.

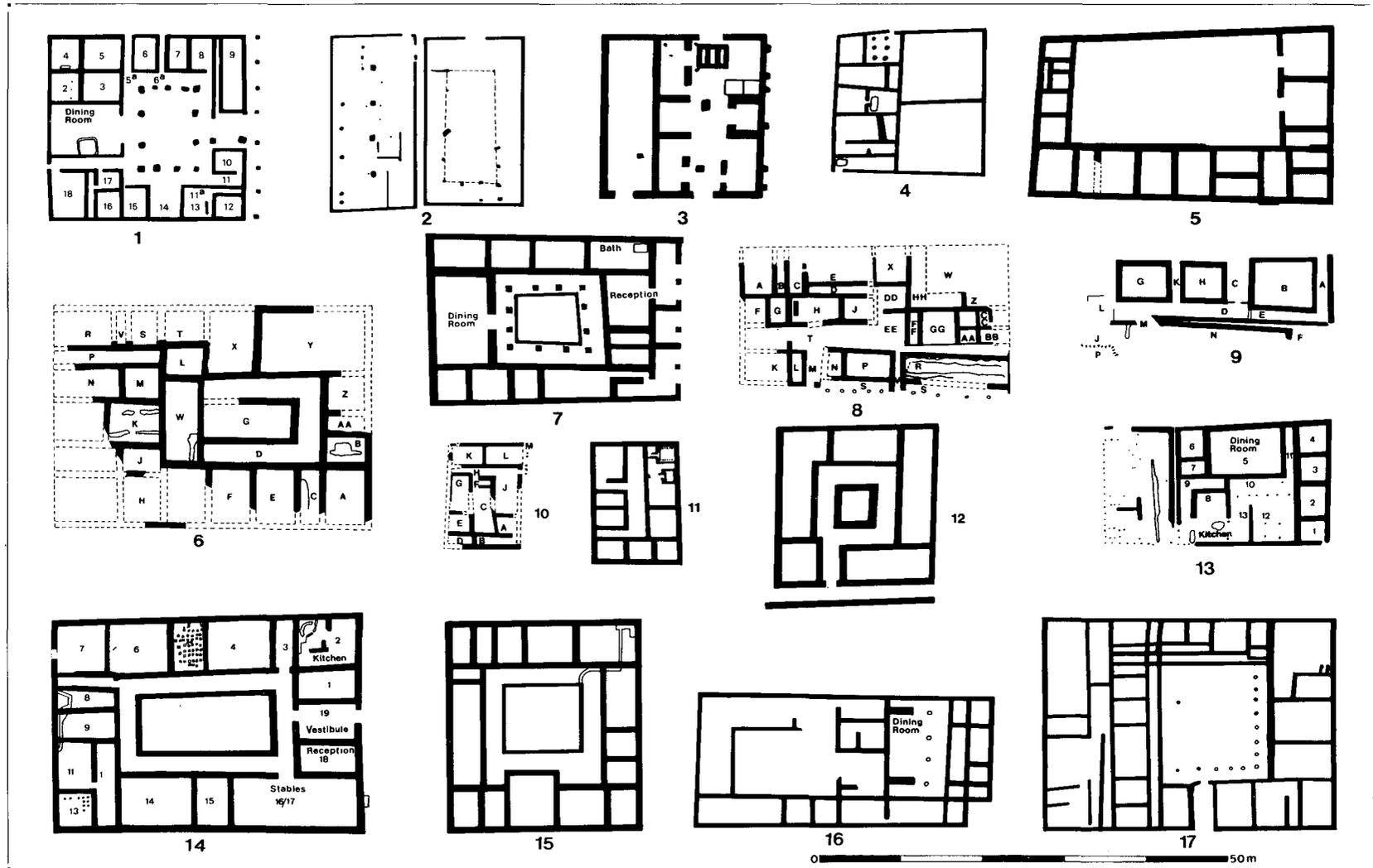


FIG. 82. Site 53: comparative block plans of timber- (Nos 1, 2, 4, 7-10, 13, 16 and 17) and stone-constructed (Nos 3, 5, 6, 11, 12, 14 and 15) *praetoria*.

Previous studies have conventionally dealt with *praetoria* by comparing the building(s) under examination with other excavated buildings of the same type and from similar installations. For most military building types, such as the granaries also discussed in this report, this yields useful results: in the case of the *praetoria* it does not. This is because the *praetorium* is not a self-contained building type. As already noted here, the *praetorium* is basically a Mediterranean town-house transplanted into a military context; i.e. it is a sub-set of a much larger group. This fact has been used to some extent in the past for the interpretation of various elements within the *praetorium*, but as the body of known *praetoria* has built up, comparisons have been made almost exclusively within this sub-set, with no reference (or hardly any) to the parent group. Meanwhile, study of the Mediterranean town-house has continued separately, accelerating markedly over the last ten years or so and discarding many of the preconceptions which had influenced interpretation over the previous fifty years. The two lines of research have tended to diverge with no feedback from one to the other. This is particularly unfortunate in that the Mediterranean material includes a huge corpus from Pompeii and Herculaneum where the preservation is such that the fittings in many rooms are almost intact and this together with the wall- and floor-decoration permits very sophisticated analysis of room functions and hierarchies.

How necessary is it to understand the Mediterranean material in order to reach a correct interpretation of *praetoria*? In our opinion it is fundamental. The Loughor material demonstrates fairly conclusively that each *praetorium* was custom-built; in other words it can reasonably be expected to have been built exactly as the commander who was to live in it wanted it. In these circumstances, the house is not just a building, it is a deliberately constructed environment for the commander's chosen life-style. The choice of the Mediterranean town-house plan-type, not necessarily well-suited to the climate of the country in which it is built,⁴⁰ is so that its residents can live in a style which is as far as possible the same as that which they would enjoy if they were at home. Any interpretation, therefore, which requires a substantial change in life-style is *ipso facto* improbable. It should cause no surprise if the closest parallels are not generalised 'Mediterranean' but belong to specific provinces or to areas of Italy from which officers of the appropriate rank would be drawn (Birley 1988, 161): if they commissioned houses in the style to which they were accustomed, we should expect such regional variations in house architecture to be related to the provenance of the officer concerned rather than to the province in which he was stationed.⁴¹

Social and architectural aspects

Crucial to any discussion of *praetoria* is an understanding of how the Roman house was used. As Wallace-Hadrill (1988, 58) points out, the modern concept of a divide between 'public' and 'private' life had no place in ancient Rome. The house was a showcase for its owner, who to a large extent 'worked from home'. There is no reason to suppose that the commander of a unit would expect to change his life-style as a result of being posted to a unit (unless he was actually on campaign or on manoeuvres) since for the upper classes military service was a part of the *cursus honorum*, not fundamentally different from a civilian magistracy. For this reason it is inappropriate to attempt the identification of 'private quarters': women and children⁴² used the same spaces as the men (Wallace-Hadrill 1988, 50–2), although there may have been a certain amount of temporal separation in the areas used throughout the course of the day.⁴³ It also may be inappropriate to envisage the commander as using offices in the *principia* (*contra* Fox & Ravenhill 1972, 76): clerks are as likely to have come to him in the *praetorium* for orders or to take dictation, as the other way round.⁴⁴

The house was the setting for two of the main rituals which were instrumental in ordering Roman society; in the morning the *salutatio*, which was largely concerned with the maintenance of client-patron relationships, and in the late afternoon the dinner party which helped to reinforce peer-bonds as well as being a form of patronage. Although a patron-client relationship can be inferred both between a military commander and his troops⁴⁵ and also between the commander and the local population,⁴⁶ we have little information as to whether the *salutatio* was transplanted to a military setting, apart from what is implicit in Josephus' description of the chain of greeting,

reporting, and instruction at the start of the military day.⁴⁷ It would perhaps also be the most natural way for a commander to fulfil his duty of hearing his soldiers' complaints (Birley 1988, 155). The layout of Building 3.12, with its axial 'audience room' (K), does strongly suggest that the inhabitant of this *praetorium* at least expected to stage the ritual (Wallace-Hadrill 1988, 90; Clarke 1991, 4–5). The evidence from other buildings is not so clear, particularly in Building 3.10 where the loss of the eastern side of the building prevents us from ascertaining whether there was a main axis to the courtyards, but there was nothing to prevent a dining-room from being used for other reception purposes (Tamm 1963, 189–205).

In discussions as to the identification of dining-rooms (above pp. 141, 162, 172), reference is made to sets of *triclinium* couches. The set of three couches which formed the standard dining suite,⁴⁸ and from which the dining-room gained its name, was arranged round three sides of the room away from the door, so that the right-hand couch (*lectus summus*) occupied the back right-hand corner, the middle couch (*lectus medius*) extended along the back wall from the *lectus summus* to the back left-hand corner, and the third couch (*lectus imus*) extended along the left-hand wall with one end against the side of the *lectus medius*. The width of the dining-room is therefore normally equal to the length of the *lectus medius* plus the width of the *lectus summus*, and its length greater than the width of the *lectus medius* plus the length of the *lectus imus*, since space had to be left at the door end of the room for serving. Different sets of couches could vary considerably in the amount of space they required. Some idea of the minimum area can be gained from examination of examples in masonry from Pompeii. The two smallest in the gazetteer published by Soprano (1950, 293, 299) measured respectively 2.3 (back) by 4.4 m (side) and 3.0 (back) by 2.7 m (side), but most are considerably larger.⁴⁹ A set of couches the size of the first example quoted would have just fitted into either Rooms J or L of Building 3.7, which are the smallest proposed as dining-rooms, with sufficient space left over for serving.

The concept that the kitchen should be close to the dining-room (e.g. Fox & Ravenhill 1972, 76; Charlesworth 1975, 21–2), although it seems to be natural to us, is a very modern one and does not seem to be found before the present century. On the evidence of house plans, the Romans seem to have classified kitchens as service-rooms, whereas dining-rooms were reception rooms. In large houses where there is a self-contained service-quarter, the kitchen forms part of it; otherwise it is tucked into an out-of-the-way corner.

A common misconception is the assumption that burnt features within a building must necessarily relate to its period of use, rather than perhaps to its construction or demolition phases. As a result, they are identified as hearths or ovens for cooking or heating and the function of the room attributed accordingly. The standard Roman hearth is a raised masonry work surface at waist-height or slightly above. Although floor-level hearths are known, they were less common (Frayn 1979, 105–6 – the example she quotes is from low-status housing). Domestic ovens are very rare indeed, and would certainly not occur in preference to a hearth: all cooking needs can be met using a hearth and access to a communal oven (particularly if the *batterie de cuisine* includes a portable oven) but only a limited number of cooking operations can be carried out if an oven is available but no hearth. We have preferred to interpret most of the hearth and oven features within the *praetoria* at Loughor as being related to construction phases, for reasons discussed at the appropriate points of the text (see above p. 162, p. 171). The only hearth probably associated with domestic use was Feature 418 in the re-conditioned Room P of Building 3.10 (above p. 165).

It should be noted that we do not attempt to identify any rooms as 'guest accommodation', even in Building 3.10 where there was a multiplicity of rooms and where more than one entrance can be inferred. The attempt to do so appears to us to be mistaken. Although Vitruvius⁵⁰ does describe the provision of guest accommodation with its own entrance, it is as part of his description of the *Greek* house as opposed to the Roman house: his account of this fascinating foreign custom is embellished with ethnographic details, showing that it was not something expected to be within the experience of the ordinary Roman. As a marker of Greek rather than Roman practice, it should not therefore be looked for in *praetoria* in forts in the north-western provinces, since the commanders of auxiliary units in these provinces were not normally drawn from the Greek-speaking areas of the Empire (Birley 1988, 161). Whilst it is true that the

commander of the fort probably put up travelling officials of suitable rank in the *praetorium*, the mechanisms of hospitality would have been rather different. Wallace-Hadrill (1988, 81) draws attention to a passage in Pliny's letters which shows that guests could be put up in rooms normally occupied by (higher-ranking) household slaves. He also points out (Wallace-Hadrill 1988, 92) that the evidence suggests the upper-class house did not contain a 'master bedroom', but that the master might sleep in one of a number of rooms:⁵¹ if this was the case, guests could be accommodated in rooms not currently being used. Putting up guests would, it seems, involve members of the household in moving round to accommodate them; who precisely had to give up their rooms presumably varied according to the relative status of the guest, members of his entourage, the host and members of his household.

All the *praetoria* excavated at Loughor represent different town-house types, some of which have been well studied, others less so. These provide a certain amount of information about the rank of the occupant. It is difficult to find parallels for the original Building 3.7 which is probably centred on a covered space with a light-well. This is not a particularly common type for a single-household dwelling, but it can be paralleled at Pompeii, in House I, 13, 8: the same device is also used in the service-quarters of the House of Adonis (VI, 7, 18).

This house appears to have been remodelled to form an *atrium*-type house. According to the conventional view, the *atrium* house had nearly reached the end of its currency as a house type by the time of the destruction in 79 of Pompeii and Herculaneum, where it is the dominant form (Boethius and Ward-Perkins 1970, 313). Recently, however, scholars have suggested that the type continued in use well beyond this date (Dwyer 1991, 29–31; Gazda (ed.) 1991, 8 and n. 26) and a building of the date suggested for ours, though few have so far been found, is not necessarily anomalous. It is, however, an unusual type to find outside Italy (and some of the more Italicised parts of Spain and Gaul). In an, albeit early, military context, the *praetorium* in the legionary fortress at Haltern in our opinion appears to incorporate a suite of rooms centring on an *atrium* as one of its main elements. Whilst the Pompeian evidence shows that in practice its occupants represented a wide spectrum of rank and wealth, from members of the local aristocracy to craftsmen and innkeepers (Evans 1980, 241–59), the *atrium* had particular associations with men in public life.⁵² This remodelling may therefore represent a conscious attempt to increase the dignity of the *praetorium* without actually rebuilding.

Building 3.9, if it was a *praetorium*, was arranged around a corridor. This type of dwelling was to become one of the commonest at Ostia, since it was well-suited for individual flats within the multiple-occupation blocks which were the norm here, as in Rome. The decoration of these flats does not however quite reach the standard of the single-household dwellings, and Packer (1972, 72) suggests that their occupants were below curial rank. It is to be noted that the decoration of this building is in the 'Nebenzimmer' style, used for rooms of lesser importance (Stroka 1979, 101–4). In a military situation, this plan-type was the standard one used for centurions' accommodation (Evans 1991, 118).

The double-courtyard house Building 3.10 has a number of distinctive features, particularly the relative scarcity of porticoes associated with the courtyards. In spite of this we have failed to discover any certain parallels. The single-courtyard house Building 3.12 represents the third of the most common Roman house types, and one which because of its extravagant use of space was particularly associated with high-class housing (this would also apply to a house with two courtyards). In spite of this it is marked as a building of distinction not so much by its plan type as by the refinement of its design, its size and the quality of its decoration.

Metrology and design

Without the complete plan of a building it is normally difficult to assess its metrology, particularly as in most instances there are too many imponderables in respect of both the original laying out and the modern record (Duncan-Jones 1980, 127–8; Millett 1982, 315). An inconclusive study (Walthew 1981, 15–35) suggested that both the *pes Monetalis* and the *pes Drusianus* were used by the Roman military planners. Whilst it is reasonable to suppose that military buildings were laid out according to rational principles, this may have involved the use of modules which

were not readily comprehensible in terms of Roman measurements (Evans, 1994).

At Loughor, with the exception of the 'upper' part of Building 3.3, the granaries were laid out in multiples of 5 pM (1 *passus*). In the case of the four *praetoria* the system of measurement used in each case has proved more difficult to establish, since the complete plan is not available. Moreover it was not possible to record accurately the total dimensions of any of these buildings. What is clear, however, is that the Roman surveyors had to face the considerable problems of the steepness of the natural slope and a site exposed to the prevailing south-westerly wind when marking out the position of the walls. This can be seen from the plans of all four *praetoria*, which show that more than one foundation trench was misaligned, although in some instances, e.g. the west wall of Room B in Building 3.9, the error was corrected when the posts were inserted.

All the *praetoria* appear to have unique ground plans which implies a degree of individual design, most clearly detectable in Building 3.12 (above p. 171). It is, therefore, reasonable to suppose that some thought was given to the internal proportions of each building. These assumptions can be tested simply, even without a complete ground plan, provided that the width and depth of a sufficient number of rooms is known and the usual caveats applied. The measurements of any whole room can then be expressed as a ratio of the sides, and the size of the module in the laying-out can be established. This was apparent in Building 3.12 (see above, p. 171), where a module of 2.5 m (frequently used double) was used to lay it out. As this is not a rational number in terms of any Roman system of measurement, it was probably derived from one of the building's overall measurements, although this cannot be confirmed.

From a consideration of proportions, it may then be possible to proceed to a consideration of the unit of measurement employed: the size of the rooms or the module can be analysed in terms of known Roman systems of measurement. If any one system fits a sufficient number of rooms then other metrological arguments can be advanced. This hypothesis was tried out on all four *praetoria*, but the only one in which a system of measurement could be identified was Building 3.9 (TABLE 8). It should be noted that certain of the dimensions were calculated from the inferred position of certain walls – thus for example the length of E is based on the assumption that the ends of that room were represented by a continuation of the south and north walls of B and the depth of C, G, H, and K from the assumption that the line used to set out the wall to the east of these rooms ran down the centre of the truncated post-trenches to the east of G and H. However, none of these suggested dimensions are unreasonable and, as is demonstrated below, even if an allowance is made for possible variations, the tenor of the whole argument is not seriously affected. All of the rooms, except D, which had the unusual proportions of 13:2 were well designed with an apparent common base unit of 1.70 m, which was discerned in A, C, G, H, and K and is almost 1 *passus* pD. As a check the metric dimensions were converted into the pM and pD equivalents (TABLE 8, cols (F) and (G)). Although there must remain a degree of uncertainty it is interesting to note that many of the more definite values such as the widths of Rooms C, D, and H were multiples of two and half pD and the *passus* or half-*passus* pD were apparent elsewhere. The greater frequency with which these values occur and the less uniform nature of the pM measurements are probably sufficient to argue that this is a building designed and constructed using the Drusianic foot and that for the most part it was intended that the rooms should be laid out in multiples or the major fractions of the *passus* pD (see col (H)).

Siting

The majority of known commander's houses are sited in the central range of buildings, usually fronting onto the *via principalis*. The building might extend from this road to the *via quintana* and from the *principia* to the *via sagularis*, as at Pen Llystyn for example, or it may have shared the area with one or more other buildings, often a granary. In Britain the majority of *praetoria* are sited to the left of the *principia*, in Germany to the right: the reasons for this are obscure.

TABLE 8: BUILDING 3.9 POSSIBLE METROLOGICAL DESIGN

(A) Room	(B) Width/Depth	(C) Ratio W/D	(D) Pro- portions (Actual)	(E) Pro- portions (Intended)	(F) W/D pM	(G) W/D pD	(H) W/D (Intended)
A	1.70 x 8.50	1:5	1:5	1:5	5'7" x 28'8"	5'1" x 25'7"	5' x 25'
B	7.60 x 6.40	1.188:1	25:21	9:8	25'8" x 21'7"	22'11" x 19'3"	22'6" x 20'
C	3.40 x 5.10	1:1.50	2:3	2:3	11'6" x 17'3"	10'3" x 15'4"	10' x 15'
D	16.25 x 2.50	6.50:1	13:2	13:2	54'9" x 8'5"	48'11" x 7'6"	48'9" x 7'6"
E	7.60 x 1.90	4:1	4:1	4:1	25'8" x 6'5"	22'10" x 5'9"	22' x 5'6"
G	6.10 x 4.90	1:0.787	50:37	5:4	20'7" x 16'3"	18'4" x 14'9"	18' x 15'
H	5.00 x 5.00	1:1	1:1	1:1	16'11" x 16'11"	15'1" x 15'1"	15' x 15'
K	1.70 x 4.90	0.347:1	8:23	1:3	5'9" x 16'7"	5'1" x 14'9"	5' x 15'

pM = 0.296 m
pD = 0.332 m

In the Claudian forts of Hod Hill and Oberstimm the *praetorium* was situated to the rear of the *principia*, a standard position in legionary fortresses. At Loughor the buildings were positioned in the north-west corner of the fort where the gradient of the natural slope was less steep than in the central area; even so it was still necessary to resort to substantial terracing in order to accommodate each structure. However it would have been even more difficult to use

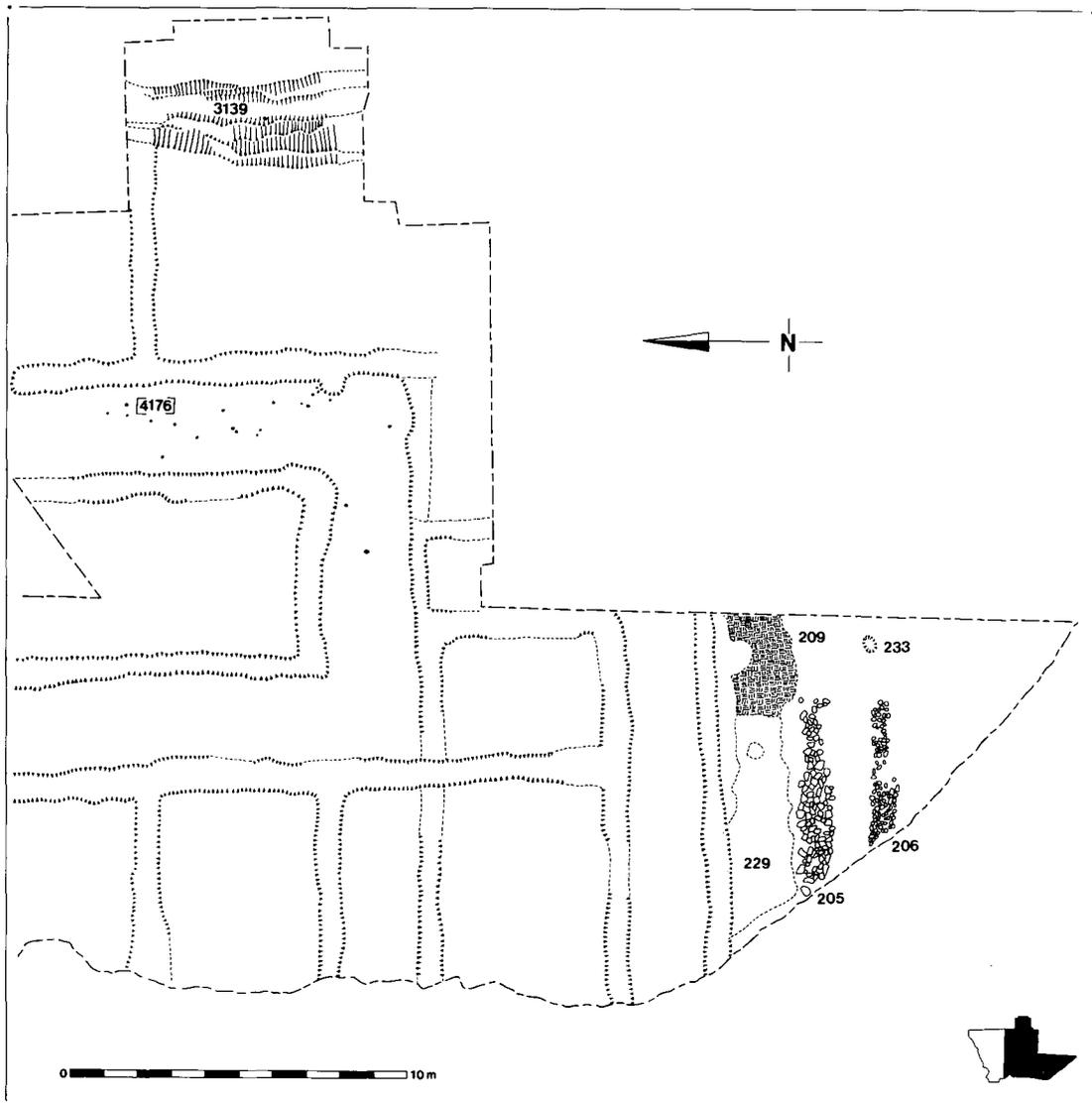


FIG. 83. Site 53: Phase 16.

this area for barracks, as the slope runs at an angle to the axes of the fort.

In Phases 1–3, the *praetorium* may also have been positioned at this end of the fort, but on the south side of the *via praetoria*, since here it would still have been built on the least steep part of the site. This suggested interchange of granaries and *praetoria* can to a certain extent be paralleled at Corbridge where it was suggested by Daniels (Gillam 1977, 57\8) that the reason for this was the need to build new granaries before the old were demolished. However at Loughor the evidence for this is equivocal (for a further discussion on the siting and significance of the Loughor *praetoria* see Chapter 4 below p. 218).

Although the topography is the most likely factor in the siting of the Loughor *praetoria*, the choice of this position may also have been influenced by a wish to enjoy the splendid views down the river over the estuary to the sea. Views, particularly sea views, were very much prized by the Romans (Clarke 1991, 19–20); and indeed the existence in Roman law of an action to protect a view suggests that it was held to contribute to the value of the property (Rodgers 1972, 129). The first *praetorium* to be built in this position, Building 3.7 did not actually make best use of it, since the views were partially blocked by Building 3.6 to the north and Building 3.8 to the west, although it was probably still visible between the two from the presumed verandah around the north-west corner of the *praetorium*. Room J, if a dining-room, was not best placed within the house to enjoy the view either, if it were accessible, as seems most likely, from Corridor H.⁵³

If there were an upstairs dining-room (see above p. 141), it might enjoy more advantages. The sea view of Building 3.10 was similarly partially blocked by Building 3.11, but Buildings 3.9 and 3.12 enjoyed an uninterrupted vista.

PHASE 16 (FIGS 73, 81)

Phase 16 was represented principally by the robbing of the walls of Building 3.12, and the excavation of a ditch (3139) in the extreme eastern part of the site (see Chapter 2 p. 82). Two cobble rafts of uncertain purpose were located above the final surface of the *via praetoria*. (This activity is associated with the reduction of the fort discussed above in Chapter 2 *passim*.)

Robber trenches [4244] and Stake-holes [4176]

The reduction of the fort would have necessitated the clearance of the ground immediately to the west and the remnants of the stone walls of the demolished *praetorium* were removed by a series of robber trenches. These were filled with layers [4245; FIGS 73, 81, for 072, 074, 119, 153, 1923, 1934, 1973] of light brown sandy loam containing appreciable quantities of building debris, whilst the robbed material would have provided a readily available source of building materials for construction within the new establishment.

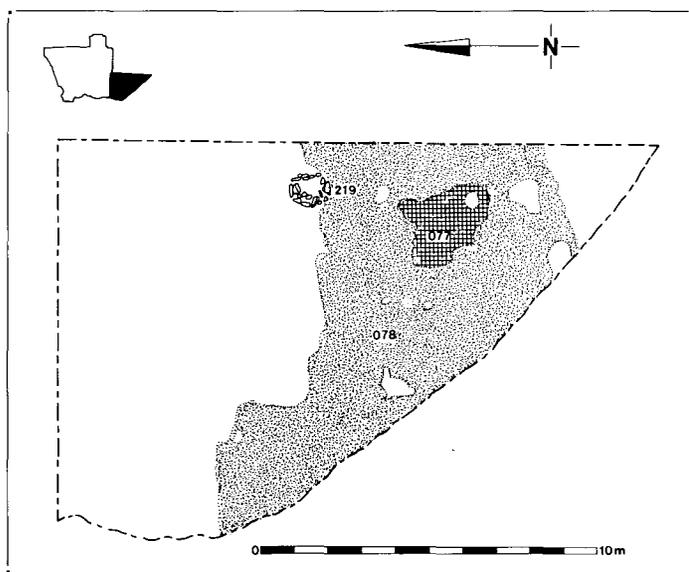


FIG. 84. Site 53: Phase 17, Contexts 077, 078, 219.

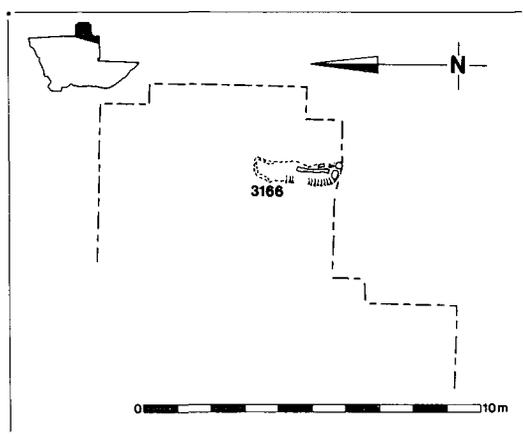


FIG. 85. Site 53: Phase 17, Flue 3166.

Twenty-two stake-holes [4176] were located in the area formerly occupied by the northern half of the veranda in Building 3.12. These features lay some three metres to the west of two thick areas of metalling (3147, 3149), perhaps the remains of hardstanding laid outside the new fort. The purpose of the stake-holes is not readily apparent.

Cobbled Rafts 205, 206 and Dumps 209, 229

The north half of the *via praetoria* surface laid down in Phase 14 underlay a dump of clay (209; FIG. 81), 0.05 m thick, which in turn underlay a more widespread deposit of broken masonry and tile fragments (229). Two cobbled 'rafts', formed from loosely packed sandstone cobbles and small boulders, were contemporary. These features, set 1.4 m apart, were on the same alignment as the underlying road. The more substantial raft, 205, was 1 m in width and stood to a height of 0.18 m, the other was narrower (0.80 m) and lower (0.10 m). A shallow (0.05 m) post-hole (233) was detected c. 1.5 m to the north of the southernmost raft. The presence of the cobble rafts would have blocked the road leading up to the west gate of the reduced fort, although it is possible that the later fort was furnished with a continuous system of defences, without a gate, on the west side. However, in either case it is unlikely that areas close to the fort would be allowed to be obstructed with debris, and therefore these features are probably more likely to be connected with activity occurring either shortly before or after the abandonment of the reduced fort (Phase 17 below).

PHASE 17 (FIGS 84, 85)

Layers 077, 078 and Post-pit 219

The cobble rafts were sealed by a metalled layer (078) perhaps representing a resurfacing of the former *via praetoria*. This was cut by a circular (0.9 m diameter) post-pit (219), which was typologically similar to features on Site 57 associated with a late reoccupation of the fort (see Chapter 2). This feature supported a circular (0.65 m diameter) post setting with a packing (198) of eight large upright masonry fragments. The post had evidently been pulled out or rotted *in situ*; there was no evidence of burning within the post-hole fill (197).

A layer (077) of burnt material, which overlay the central part of the metalled surface, was perhaps contemporary with the final withdrawal from the fort.

Flue 3166

The south end of the filled ditch (Chapter 2 above) of the reduced fort was cut by a tile-and-sandstone-lined flue (3166, 3180), which measured 2.30 m by 0.68 m. The feature was set on a base of dark grey clay densely flecked with charcoal (3181) and had been filled with layers of clay burnt to orange and brown colour (3182, 3183), which may have derived from the superstructure of the flue. This feature must have been cut after the fort had fallen into disuse.

DATING PHASES 16 and 17

Two Trajanic coins (Cat. Nos 60 & 62) were recovered from a dump (229) above the *via praetoria* surface associated with Building 3.12 and from a possible resurfacing (078) of that road. The pottery from these phases and the post-Roman contexts contains Trajanic and small quantities of later material. There is sufficient later material (see Webster below p. 384) to suggest a third- or fourth-century date for some of this activity.

THE WALL-PLASTER By A. G. Marvell

One of the more unusual aspects of the excavations undertaken in 1971 and 1973 was the comparatively large quantity of wall-plaster collected from the test sections dug in the gardens of Upper Station House and 6 and 8 Dock Street. (Ling & Ling 1979, 35–9, fig. 10). Excavation in the same area (Site 53) produced further large quantities of wall-plaster; plaster was only absent in Phase 1.

Introduction

The plaster was initially recorded on site, but in varying degrees of detail. This consisted for each context of counting the number of surviving fragments, in some instances weighing the total and in other instances also noting the quantity of plain or yellow/white fragments as opposed to those decorated in other colours. Certain groups of fragments or individual pieces unusually decorated were sent to University College, Cardiff for conservation as was a large section of collapsed plaster (from Context 616) from Building 3.9.

Much of the plaster, however, was destroyed in the fire that devastated part of the Trust's main premises in 1983. The site record indicates that more than 5,500 pieces were collected; only 1,270 now survive and 262 of these are unstratified, many of this last group are pieces retrieved from the fire debris, others became separated from their contextual origin in conservation. As only 23 per cent of the total collected was available for study, and particularly as 21 per cent of this was unstratified, detailed statistical analysis was not practicable: it is, for example, impossible to make any definite quantification of the proportions of white to coloured decoration. Consequently only those fragments showing particular decorative schemes are reported here, with the remainder retained in the archive. Likewise analysis of the mortar and pigments used is better reserved for a wider study.

Methodology

In determining the approximate surface areas I have used the method described by Roger Ling (in Ling & Ling 1979, 35 n. 13). The widths for bands, lines, and borders are as in Barbet (1974, 21), unless otherwise stated.

Techniques and decoration

In general terms there is little that needs to be added to Roger Ling's previous comments (1979, 35–9). (For a general discussion on plaster manufacture and application, see Davey & Ling 1981, 51–61; and also Barbet 1974.) Most of the plaster is fairly coarse and would have been mixed on site, probably using locally available materials. Some fragments have flecks of charcoal, crushed brick, straw impressions, or crushed *opus signinum* incorporated into the matrix, particularly in the lower courses, which no doubt served as a form of damp-proofing.⁵⁴ A few pieces are comparatively light but still have considerable tensile strength, these could conceivably have come from vaulted ceilings. Evidence of other building materials and methods of application was also apparent. Many of the pieces from the demolition debris of Building 3.10 still had daub attached and those recovered from the foundation trenches of Building 3.12 were attached to tiles, bricks, or *opus signinum*. Some of the pieces from Phase 15 had ridges to the rear denoting where the plaster had been applied to stone walls. The plaster varied in thickness from 30 mm to 740 mm. Two contexts (018, 1880) produced pieces decorated with two identical faces at right-angles, probably jambs, and two others (1911, 2933) corner or

quarter-round mouldings. Two other corner fragments (Nos 9 & 10) are described in more detail below.

Much of the plaster-work was painted solidly in white or yellow, often exhibiting signs of the decorator's brushstrokes as do some of the patterned pieces, although others are clearly the work of skilled painters. Several fragments had been resurfaced, prior to redecoration, with a thin (2–5 mm) rendering. Others show signs of pecking in preparation for resurfacing. Of particular interest is the fact that most of the plaster from the demolition debris from Building 3.9 (Phase 9) had been covered with a brushed-on lime slurry prior to redecoration which had not occurred before the building was destroyed.

Two groups of painted pieces show particular decorative skill. One was from contexts associated with Phase 10 (Nos 3–5, 16, 17), and came from a series of pits cut between two periods of building activity. These almost certainly derived from buildings elsewhere in the fort as they are not paralleled in any of the other groups. The other was from contexts associated with the stone-constructed *praetorium* (Building 2.12) (Nos 10–13, (?)14, 15). Some of the plaster found in the foundation trenches of Building 3.12 had perhaps also come from buildings elsewhere in the fort (see for example No. 9 below).

Much of the decorated plaster from Building 3.12, shows evidence of an apparent decorative scheme, albeit a fragmentary one. This consists of panels in red or orange with a black border and areas between the panels in a white ground under foliate or vegetal candelabra decoration in orange, black, green, or red. This decorative scheme shows similarity with other Romano-British decorated plaster of the Trajanic-Hadrianic period.

Catalogue

1. 821 Weight 60 gm, thickness 8–14 mm, surface area 37 cm². 8 fragments, coarse grey crumbly plaster with grey or black grits. White-washed with secondary orange-brown slip.
2. 1616. Weight 2 kg, thickness 9–34 mm (the majority are in the range 28–32 mm), surface area 1,526 cm². 68 fragments, all of a single layer of crumbly grey plaster with occasional grits and flecks of charcoal and tile decorated with a white ground with a black band over in the horizontal and vertical. The reverse of a single fragment exhibits a right-angled impression presumably from a timber upright. The decorative scheme perhaps consisted of a black band demarcating the dado with rectangular panels outlined in a black border. The plaster on all fragments had been covered by a thin yellow-brown lime-based slurry in places pecked for redecoration which had not occurred. The decoration is reminiscent of the so-called 'Nebenzimmer' style (Stroka 1979) associated with buildings of poorer status.
3. 592 (253). 1 fragment, greyish plaster with a relatively high proportion of grey and brown grits and slightly rough surface. The decoration consists of a pinkish white ground with green and red speckles and splashes, probably an attempt to reproduce a variegated stone effect. Similar to No. 17.
4. UCCC Lab. No. 3140. Weight 50 gm, thickness 20 mm, surface area 30 cm². 2 fragments, greyish plaster with a relatively high proportion of grey and brown grits. Composed of two layers, the lower (i.e. wall side), 6 mm thick, is lighter in colour and contains flecks of charcoal, the upper layer is 14 mm thick. The decoration is the same pinkish white ground as No. 3 with adjoining border and line of dark green and black respectively. The join between these two bands is highlighted by a further application of diluted paint to produce a lighter green against the green and a grey against the black

- border. Each of these highlights is painted, like the remainder, with confident brushstrokes.
5. UCCC Lab. No. 3140. Weight 50 gm, thickness 18 mm, surface area 39 cm². 1 fragment, greyish plaster of the same composition as No. 4 decorated initially in the same pinkish white ground. This is under a black band, next to a dark yellow area, 16 mm wide, under indistinct, but possibly foliate, decoration in green.
- Although not reconstructable in *strictu sensu*, enough of Nos 3–5 survive to suggest the following scheme: panels of coloured ground under ?foliate decoration divided by green and black borders with the division between the panels finely highlighted, the variegated stone effect perhaps comes from the dado.
6. 2022. Thickness 21 mm. 1 fragment, crumbly grey plaster with white and grey grits and tile fragments. Rough surface coated in white and underlying a black border, and traces of red.
7. 217 (057). Weight 10 gm, thickness 16 mm, surface area 20.67 cm². 15 fragments, coarse grey/brown plaster with a high proportion of white and grey grits with occasional charcoal and tile flecks. Very rough surface decorated with white ground under orange foliate decoration applied in long continuous brushstrokes.
8. 1954. 3 fragments, consisting of a lower layer, 6–16 mm thick of coarse grey plaster with a high proportion of grey and black grits, charcoal flecks and straw impressions, finely decorated in white on a smooth surface, and an upper layer, 10–17 mm thick of brownish plaster with grey and white grits and occasional charcoal flecks decorated with an orange ground under bands of green. The decoration on the upper piece is badly abraded. These pieces are clearly indicative of a substantial refurbishment. Seven other fragments of the lower layer were also recovered.
9. 1982. 7 fragments, grey plaster with grey and black grits. 3 of these pieces are attached to *opus signinum*. All have a very smooth final surface in pinkish white, except 1 small fragment decorated with a grey band adjoining a red border.
- The fragments forming No. 9 are dissimilar to the plaster recorded elsewhere from the site, and the appearance of *opus signinum* combined with the location of the material in wall foundations perhaps indicates an origin elsewhere in the fort possibly from the nearby bath-house.
10. 226 (058). Weight 590 gm, surface area 367 cm². 53 fragments, coarse grey plaster with white and grey grits. Some pieces have a lower and coarser layer of brownish plaster containing fragments of earlier decoration along with tile and daub flecks. The final surface is roughly finished and shows distinct signs of pecking. The fragments can be divided into three groups with all the pieces having an initial coat in white. 20 fragments some of which came from a corner were painted in red. A second group of 12 fragments has the same red ground separated by a black band painted over an area of white underlying foliate decoration in black and painted in continuous if rough strokes. The third group has orange spots and splashes over the white ground. This may be an attempt to produce a variegated stone effect, or alternatively is part of the same or similar decoration as in No. 13, but the decoration is too worn to be certain.
11. 1910. Surface area 127 cm². 13 fragments, the plaster is formed as No.

10. White ground with green foliate decoration over and painted in long continuous brushstrokes.
12. 1910. Surface area 83 cm². 15 fragments, the plaster is formed as in No 10. White ground with orange foliate decoration, possibly part of a vegetal candelabra, painted over.
13. 1910. Surface area 187 cm². 17 fragments, the plaster is formed as in No. 10, with badly abraded black border painted over the white ground.
- Nos 10–13 all come from the Building 3.12. A total of at least, 1,020 fragments were recorded from contexts associated with this structure (but excluding pieces recovered from the foundation trenches), 150 now survive including all of the coloured pieces bar 4. The proportion of coloured to plain or yellow\white pieces is calculated at 1:10. Nos 7, 14 and 15 may also belong to this group and form part of a scheme or schemes previously described.
14. 016. Weight 10 gm. 1 fragment of coarse grey plaster with dark grey grits and charcoal flecks. The decoration is white ground under red adjoining an orange border.
15. 1905. Weight 100 gm, thickness 8–20 mm, surface area 199 cm². 14 fragments with a lower coat of greyish plaster with black, white, and brown grits and occasional straw impressions under a thin (1 mm) final application of fine smooth grey plaster. One fragment comes from a corner and is decorated in white ground under orange, separated from an area of red ?foliate decoration including one spiral by a black line.
16. UCCC Lab. No. 3225. Weight 275 gm, thickness 14–27 mm, surface area 100 cm². 3 fragments, grey plaster with light and dark grey grits and distinct pinkish final application. The decoration is pinkish white ground underlying a dark grey border, in turn underlying a light grey central line.
17. UCCC Lab. No. 3225. Weight 50 gm, thicknes 6–14 mm, surface area 37 cm². A single fragment of plaster, now broken, formed as in No. 16. The decoration is green and red spots and splashes identical to No. 3.

Nos 16 and 17 probably belong to the same group as Nos 3–5.

THE BRICK AND TILE By E. M. Evans

Introduction

A very large assemblage of brick and tile was recovered from the first phase of excavation on the Station House Upper site, but unfortunately much of the material was destroyed in the fire before more than a cursory examination had been carried out. Certain material from the sites across the defences is also reported here. The full report and analysis is retained in the archive with only a summary reported here.

Methodology

Criteria for identification of types and fabrics

Types

The approach to identification of tile types has been to establish the tile type beyond reasonable

doubt. As a result, criteria which are common to more than one type of tile have not been accepted as diagnostic. The names used for tile types follow Brodribb 1987.

Fabrics

On most specimens the surface used for examination was a fresh break, preferably one which ran from the surface into or across the core. As far as possible breaks near the edge of the tile were avoided, so as to minimise any distortions caused by surface finish. In a few cases it was not practicable to break the tile, either because the fragments were too small or too hard, or to avoid unacceptable damage to possible display specimens; in these cases an old break was used for examination. The break was examined under x10 magnification. No thin-section work has been carried out.

The criterion used to establish each individual fabric was that it should be consistently recognisable at x10 magnification, which was the strongest magnification available for most of the work. This may have involved conflating two or more actual fabrics, but consistency was judged to be of more importance than attempting a fine separation of fabrics which could not be maintained.

Four main fabrics were identified, and up to another four were present, but most of the discussion of these must be regarded as provisional until a programme of thin-section work can be arranged for Roman tile in South-East Wales.

Fabric description

- A. Very fine, carefully prepared fabric, ranging in colour from light buff to orange or rose-pink, some examples being light buff with an orange surface. Contains hardly any inclusions, although a few fragments of brown, orange-brown, and cream rock are visible.
- B. Although no fine sands are visible at x10 magnification, the 'velvety' texture of the matrix suggests that they are present and could be seen at higher magnifications. Contains moderate amounts of larger quartz sands and small fragments of dark brown rock.
- C. Similar to (B), but texture dominated by abundant medium-sized quartz sands.
- D. Very similar to (B), but characteristically contains little white or cream specks, apparently fragments of shell. Further examination might reveal whether this is a truly separate fabric, or caused merely by minor variations in the clay source.
- E. Not well mixed, and may simply be a variant of (B). The most characteristic feature of this fabric is the swirls of orange and cream clay in the matrix. Although no fine sands are visible at x10 magnification, the 'velvety' texture of the matrix suggests that they are present and could be seen at higher magnifications. Contains quartz sands and pieces of cream and orange-brown rock.
- F. Although no fine sands are visible at x10 magnification, the 'velvety' texture of the matrix suggests that they are present and could be seen at higher magnifications. Contains white specks, and many platy inclusions and small lumps of sandstone.
- G. Typologically light ochre with a salmon-pink core. The texture is rough. Under x10 magnification a moderate amount of sand with angular grains can be seen, giving a laminar texture. Used only in 2-4 box-tiles from Site 57.
- H. May or may not be a variant of Fabric A, being carefully prepared and pale orange in colour, but it has a much higher proportion of mica than any of the other fabrics. Further investigation required.

Interesting questions are raised by the possibility that one Fabric D *tegula* with a triangular-sectioned flange was made in a mould possibly identical with that normally used for the normally Fabric C production of this type of tile (see below p. 193).

Use of brick and tile in buildings

The brick and tile studied was associated with four buildings, Nos 3.4, 3.9, 3.10 and 3.12 on the Upper Station House site (Site 53). There may be some distortion in the record, in that

some material was destroyed in the fire of 1983 before it had been examined. Context 584 in Building 3.4 contained a single large fragment of half-box tile weighing 9.45 kg (see below p. 192), and Building 3.9 brick and tile fragments of all types to a total of 16.30 kg. In neither of these buildings was brick and tile incorporated into the surviving fabric. Both Building 3.10 and Building 3.12 had brick and tile incorporated into the fabric and forming part of the destruction levels. Building 3.10 had 44.40 kg of all types incorporated within the fabric: this appears to have been used as hard core, so presumably derived from some other building either wholly or partly demolished at around the time that it was being put up. The 13.85 kg from other contexts associated with this building probably had a similar origin. In contrast, Building 3.12 had 307.10 kg of brick and tile incorporated within its structure, and a further 302.95 kg came from destruction deposits. Again, most of this appears to have been employed as hard core. Some of this material may have been derived from Building 3.10 or the nearby bath-house, but there is no way of establishing whether this was the case.

The tiles

Tile for cavity walling

Box-tile

For the purposes of identification, the following features were taken as diagnostic: sanded outer surface combined with manipulated inner surface; sanded inner surface combined with smoothed outer surface where there was either lattice (or some other form of keying) or the tile had been shaped round a right-angled former; vents; corners formed by the junction of two slabs of clay with either straight or bevelled edges, or with additional clay applied to the inside of the corner; thin strips of clay of rounded triangular section; extreme thinness (less than 10 mm).

All the box-tile was Evans and Staplehurst (1983–4) Type 2, with the possible exception of one small fragment from Site 53, which may be Type 1 with rounded outer corners in Fabric B. However, the piece was too small for a certain identification.

Enormous quantities of box-tile were recovered, particularly from the construction levels of Building 3.12 (Site 53) where it was used as hardcore. Unfortunately much of this material was destroyed in the fire before it could be properly examined, and very few examples have any indication of dimensions other than thickness. Fabrics A, B, D, E, F, G, and H are represented, the bulk of the material being in Fabric A and most of the rest in Fabric B. Fabric G is represented by joining fragments of two or possibly three tiles from contexts associated with the ovens on Site 57.

The box-tiles in Fabric A have butt-jointed corners, with the sides being butted against the faces. The external surface treatment is a scored lattice, but this is not always present. Presumably it was considered that the roughness created by the incorporation of the sand coating the mould would provide an adequate key: at any rate, mortar not infrequently survives adhering to these surfaces. The inner surfaces, making allowances for the presence of finger-made ridges, are very smooth, almost burnished. The almond- or (less frequently) diamond-shaped vents are, with the exception of one example, cut assymmetrically, so that one side of the hole is against, or impinges slightly upon, the inner surface of the front/back of the tile. The size and position of the vents was not usually possible to determine; in those examples where this was possible, they were 65–77 mm long and 67–105 mm from the ends of the tile. As far as could be ascertained, there were two vents on each side.

The thickness of the fabric was difficult to ascertain because of the method of manufacture, but it ranges between 7 and 20 mm.

The examples in Fabric B were mostly rather thicker, between 14 and 22 mm, with more in the upper part of the range (c. 20 mm). One example was 134 mm wide across the side with the vent in the middle, and with a length in excess of 210 mm. In most examples the corners were butt-jointed, but one or two may have been mitred, though it was not possible to be sure. Lattice was scored on some examples but not others. One example in Fabric D, had a side of

120 mm with the vent in the middle. It seemed to be made to the same criteria as the Fabric B examples.

Fabric E was represented by one fragment (53\1848). As this was extremely small it is impossible to say anything about it other than that the external surface had an extraordinarily dimpled finish. Three fragments in Fabric F came from Site 55 (Contexts 029, 045, and 063). The only example where it was possible to ascertain the details of the corner construction had a mitred corner. The thickness was at least 8 mm, though the corners were thicker. The same sand, with its inclusion of platy pebbles, was used for the exterior as for the temper.

The box-tiles in Fabric G from Site 57 were extremely coarse and crude. The thickness of the fabric was between 21 and 25 mm, the width 232 and 242 mm (face), and 162 mm (side) and the length 496 mm. There was no lattice, and the almond-shaped holes were cut 124 mm or 151 mm from the end and appeared to be close to the face.

Fabric H was represented by only a few fragments 12–18 mm thick.

Half-box-tile

There was only one certain example of this type (see also below p. 193, notes on rectangular-flanged *tegula*/half-box-tiles). This consisted of a considerable part of an example in Fabric B. The thickness was 40–6 mm, width was 431 mm and the length >330 mm. Two corners survived, both with the bosses extant. One boss was slightly larger than the other, but they both had a similar profile. At the end of the tile the boss was upright in profile like a standard *tegula* flange, with the inner edge sloping slightly to a rounded corner. Away from the edge, the inner side of the boss started to taper away and the surface of the tile to rise into the boss. Maximum length of boss 114 mm; maximum width 56 mm at bottom, 35 mm at top.

Other tile with latticed surface

- 1 53, 273. 1 fragment, 21–25 mm thick, with both sides smooth and one marked with an incised lattice of lines approximately 50 mm apart and at right-angles to each other.

Roofing-tile

Imbrex

Curvature was taken as a diagnostic feature for the purposes of identification, provided the thickness of the tile was not greater than 30 mm, the outer surface was smoothed and the inner surface sanded. Fabrics B, C, D, and F were represented, Fabric F by only a single example (from 53\891). There was no discernible difference between examples of the different fabrics.

Only a small amount of this type of tile was recovered from any of the sites, and in no example was the size of the fragments large enough to give any dimension apart from thickness (12–20 mm). Finger-marking was uncommon, though as the examples in Fabrics B and D tended to be underfired and therefore soft, their surfaces were frequently abraded.

2. 53, 112 (071). Fragment in Fabric D, pierced by a hole which appeared to have been made before firing, although the amount of abrasion makes it impossible to be certain.

Tegula

Two different types of *tegula* were present. One had the rectangular-sectioned flanges which are standard for this type of tile: in the other the flanges were triangular in section. Whilst examination of the tile assemblages from some sites in South-East Wales suggests that *tegulae* and half-box-tiles were made in similar fashion and can be distinguished by the presence or absence of cutaways and the length of the flanges (Evans, Dowdell & Thomas 1985, 117–18), there is no indication that flanged tiles were used here for cavity walling, though the fact that *tegula* cutaways seem to have frequently been made after firing makes it impossible to rule this

The majority of the brick fragments were between 40 and 55 mm thick, suggesting a target of 2 inches. However fragments in Fabric D from 53\1943, 53\2027, 55\092, and 57\023, which are 73 mm approximately (75 mm, 72 mm, and 70 mm respectively), suggest that a standard of 3 inches may also have been employed. Two other fragments in Fabric B, from 53\3220 are also extremely thick, one increasing from 80 to 85 mm over a distance of 120 mm, and the other being 95 mm thick. It is possible that these, especially the former, might have been solid voussoirs. Thinner brick, possibly made to a 1 inch standard, came from 53\988 (Fabric C, 25 mm thick), 1910 (Fabric D, 22–30 mm thick), and 57\085 (three fragments in Fabric B, respectively 25–31 mm, 31–35 mm, and 32–36 mm thick).

No complete bricks survived to be subjected to a full investigation: although a number were excavated, only two survived the fire, and of these one had lost a corner. Dimensions noted before the fire are given in TABLES 9 and 10. All the complete bricks were noted as being in Fabric B; there were four *bessalis*, one 11" square, two 14" square, and three 16" square. Among those bricks where one dimension was present, there were nine 8" across, one 9", and one 10".

From Site 55 came a number of bricks which had been cut down from a larger size. In three the finished size was approximately 100 mm square (two examples in Fabric B from Context 042, and one in Fabric D from 063). A fourth brick, from Context 020, seems to have been cut down to a size of 130 mm by 123\8 mm but as it was low-fired (Fabric B) and very abraded, it was impossible to be sure of this.

TABLE 9: COMPLETE BRICKS AND BRICKS WITH 2 SIDES SURVIVING

<i>Provenance</i>	<i>Type</i>	<i>Length</i>	<i>Width</i>	<i>Thickness</i>	<i>Weight</i>	<i>Fabric</i>	<i>Remarks</i>
55\061	<i>Bessalis</i>	189 mm	189 mm	41–9 mm	2.9 kg	B	Corner lost
53\009	<i>Bessalis</i>					B	Destroyed in fire
53\157	<i>Bessalis</i>					B	Destroyed in fire
53\594	<i>Bessalis</i>					B	Destroyed in fire
57\054	11" square	276 mm	268–70 mm	50–5mm	5.1 kg	B	Complete tiles destroyed
53\296	14" square				12.6 kg	B	Destroyed in fire
53\296	14" square					B	Destroyed in fire
53\296	16" square				13.2 kg	B	Destroyed in fire
53\296	16" square					B	Destroyed in fire
53\296	16" square					B	Destroyed in fire

TABLE 10: BRICKS WITH ONE SIDE SURVIVING

<i>Provenance</i>	<i>Type</i>	<i>Width</i>	<i>Thickness</i>	<i>Fabric</i>	<i>Remarks</i>
55\020	8" across	208 mm	45 mm	B	
54\055	8" across	205 mm	45 mm	B	Seems trimmed to length of 102 mm
53\157	8" across			B	Destroyed in fire
53\995	8" across	205 mm	35–42 mm	B	
53\1044	8" across	200 mm	45–9 mm	B	
53\1822	8" across	204 mm	37 mm	D	
53\1999	8" across	196 mm	40–1 mm	B	
53\3182	8" across	193–4 mm	37–41 mm	D	
53\3219	8" across	202 mm	41 mm	B	Split into 2 triangles
53\079	9" across			B	Destroyed in fire
53\3220	10" across	266 mm	59 mm	B	

Tiles of other form and other ceramic object

4. 53, 568 (214).

Thickness 37–40 mm, diameter of boss (at base 75 mm). *Tegula mammeata* in Fabric B. The boss is in one corner, but as it is broken it cannot be determined whether this tile is of Brodribb Type 1 or 2.

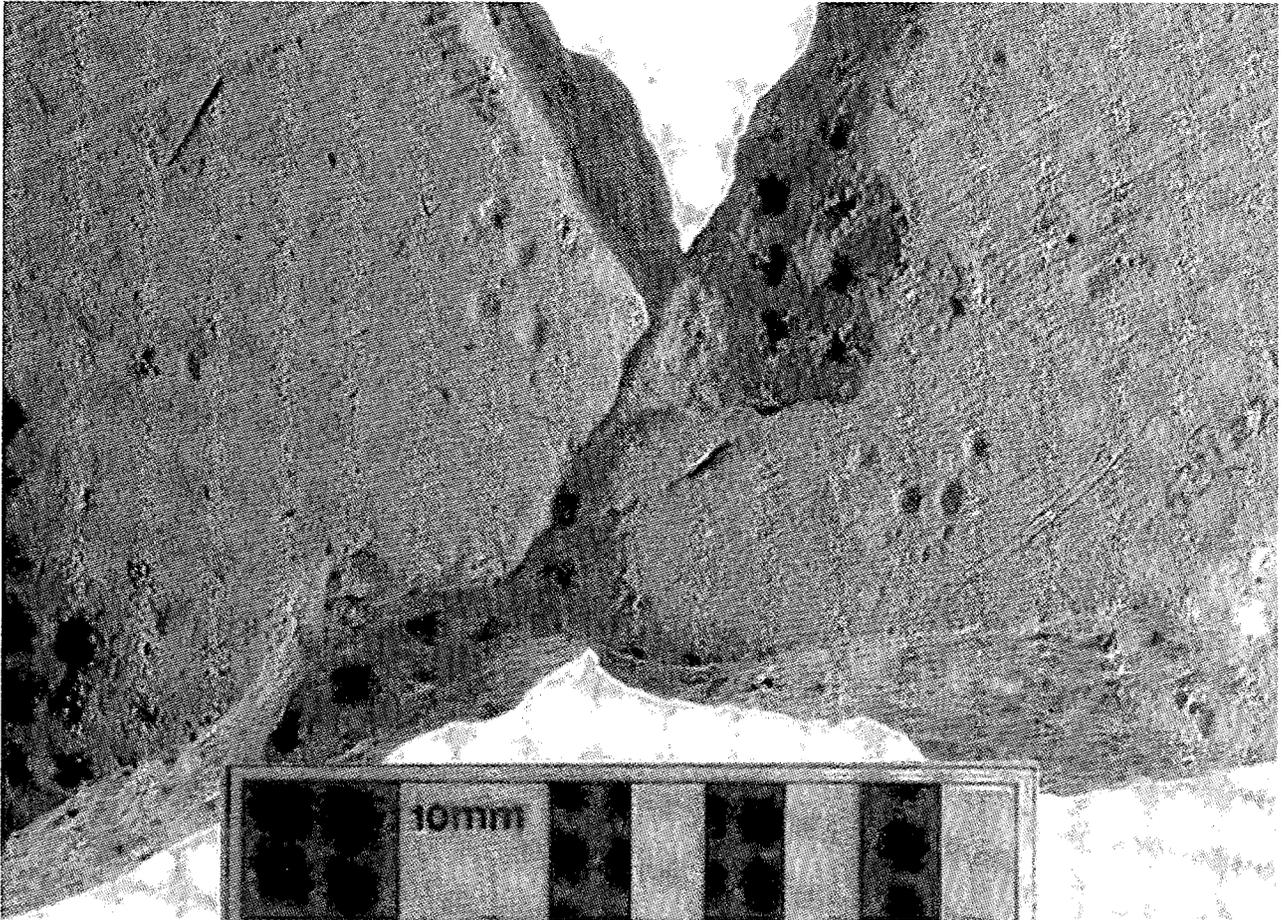


PLATE XVI. Brick and tile: weasel footprint.

5. 55, 053 (286). Dimensions 59 mm x 84 mm. Possible fragment of pipe in Fabric B. This was wheel-thrown. The thickness was 100 mm at one end of the fragment, increasing to 200 mm at the other, and the diameter 180 mm.
6. 53, 1905 (855). Fragment in Fabric B with a bell-shaped profile. The shape in plan is uncertain, as the surviving fragment is irregular.

Markings on tiles and bricks

*Stamps*⁵⁵

7. 53\249 (061). From the tracing made on site, this appears to have been Boon Type A ii 6 with the bar on the 'A' absent (the initial 'LE' was also missing).

Signatures

There are no complete signatures either extant or recorded on tiles which were lost in the fire. However one undiagnostic tile in Fabric D from 53\1960 bore on one edge most of a signature based on a 3-finger arc.

Tally-marks

Two extant tiles (Nos 8 and 9), both Fabric B, bear tally-marks and these were also noted on two tiles lost in the fire (Nos 10 & 11)

8. 53, 1958 (851). Reads 'IIIVXX';
9. 53, 1960 (850). Reads 'X' with the character broken along '/'.

10. 53, 157 (112). Reads 'VIII' with the tile broken along the final 'I'.
 11. 53, 1943 (555). Reads 'XX', 'XXI', or 'XXI.'

*Prints*⁵⁶

TABLE 11: PRINTS ON TILES AND BRICKS

<i>Provenance</i>	<i>IF no.</i>	<i>Type</i>	<i>Fabric</i>	<i>Print</i>
53\310		UD	D	shod human
53\316		UD	B	shod human
53\603		UD	B	shod human
53\309+623		UD	B	shod human
53\1908		UD	B	shod human
53\2701		UD	B	shod human
53\147	532	brick	C	dog
53\316	106	brick	B	dog
53\335	113	teg/half-box	D	probable dog
53\502	245	brick	E	cat
53\2211	531	UD	B	weasel (PL. XVI)
53\142	290	UD	B	possible mustelid
57\143	289	UD	B	roe deer

APPENDIX: CONTEXT PHASE LISTS AND GROUP NUMBERS

Context phase lists

These are lists of context numbers ordered by stratigraphic phase for Site 53. The list includes all numbers, including voids (negative features), structure numbers, and group numbers. It commences with those that can be assigned to the earliest phase of activity. Contexts are placed in the earliest phase group possible.

Group numbers

Wherever possible groups of contexts have been collectively numbered to reduce intrusion into the text of the structural report. The lists below only include the group and context numbers for groups of layers in order to facilitate reference between the structural report and the finds reports. Other group numbers in the text provide a link with the archive and report plans. Some finds were collected during cleaning of the site prior to photography and were recorded either under numbers assigned for this purpose or under the building numbers; these are given at the end of each list.

Context phase list*Phase 1*

1419, 1462, 1491–1501, 1503, 1504, 1527–1537, 1708, 1754, 1756–1761, 1763–1766, 1768, 1775, 1780–1787, 2632, 2640, 2648–2657, 2677, 2683–2685, 3901, 3911, 3912, 3945, 3951–3956, 3980, 4002–4011, 4027, 4028, 4033–4044, 4075, 4076, 4081–4085, 4105, 4106, 4110–4112, 4115, 4177

Phase 2

212, 784, 1218, 1221, 1222, 1239, 1240, 1243, 1244, 1247, 1248, 1254, 1255, 1258, 1259, 1269, 1272, 1273, 1276–1279, 1427, 1428, 1431–1434, 1441, 1442, 1473, 1474, 1482, 1502, 1520, 1524, 1525, 1563, 1564, 1588, 1589, 1591–1603, 1607, 1608, 1611–1620, 1622–1634, 1639–1656, 1661–1665, 1669–1676, 1679–1687, 1689–1692, 1694–1707, 1709, 1710, 1727, 1737–1753, 1762, 1767, 1769–1774, 1777, 1842, 1843, 1845, 1847, 2491, 2515–2522, 2547–2549, 2611, 2637–2639, 2647, 2658–2661, 2671, 2672, 2686–2697, 3609, 3642, 3643, 3759–3762, 3779, 3820–3825, 3853, 3880–3883, 3886–3889, 3899, 3900, 3906–3909, 3913–3915, 3931–3940, 3943, 3944, 3947, 3948, 3958–3969, 3973–3978, 3981, 3982, 3986–4001, 4012–4019, 4021–4026, 4029–4032, 4045, 4060, 4065–4068, 4071–4074, 4087–4093, 4095, 4096–4098, 4102, 4103, 4104, 4116–4129, 4174, 4178–4182

Phase 3

585, 736, 737, 786, 788–790, 797, 798, 807, 808, 810–813, 978–983, 989, 990, 1139, 1142, 1170–1173, 1180–1186, 1189, 1190, 1193–1196, 1199, 1200, 1203, 1204, 1208–1217, 1219, 1220, 1223–1230, 1233–1238, 1241, 1242, 1245, 1246, 1249–1253, 1260, 1261, 1264, 1266–1268, 1270, 1271, 1274, 1275, 1280–1285, 1290–1336, 1341, 1342, 1356–1368, 1377–1382, 1392–1397, 1402–1409, 1411–1418, 1420–1426, 1429, 1430, 1435–1438, 1440, 1443, 1444, 1446 – 1454, 1457–1460, 1464–1466, 1468–1470, 1475–1481, 1483–1490, 1505–1516, 1538, 1540–1550, 1555–1557, 1569, 1570, 1573–1587, 1609, 1610, 1635–1638, 1657–1660, 1677, 1678, 1688, 1711, 1728, 1808–1811, 1841, 1844, 2373, 2374, 2405–2408, 2486, 2487, 2490, 2491, 2530–2546, 2567, 2570–2600, 2610, 2612–2631, 2641–2646, 3818, 3819, 3896, 3949, 3950, 3983, 4183–4185.

Phase 4

514, 530, 531, 533, 534, 566, 567, 927, 929–933, 1159, 1160, 1168, 1169, 1231, 1232, 1256, 1257, 1286–1289, 1369–1376, 1383–1391, 1398–1400, 1439, 1445, 1455, 1456, 1461, 1517–1519, 1521, 1560, 1561, 1566, 1567, 1571, 1572, 1776, 2556, 2557, 2568, 2569, 2601–2609, 2633–2636, 4099–4101, 4107–4109, 4186–4189

Phase 5

570, 571, 926, 1050–1126, 1143–1147, 1150, 1152–1156, 1161, 1162, 1165–1167, 1174, 1265, 1471, 1590, 1729, 1829, 1830, 1832, 1834–1840, 1846, 2290, 2294, 2296, 2297, 2304–2324, 2325–2350, 2371, 2372, 2375–2394, 2396–2400, 2402–2404, 2410, 2412–2474, 2478, 2479, 2485, 2488, 2489, 2492, 2497–2514, 2523–2529, 2550–2566, 2662, 2665–2670, 2673–2675, 2698, 2699, 2700, 3571, 3622–3625, 3638, 3639, 3650–3657, 3678, 3679, 3691, 3715–3724, 3730–3737, 3750–3758, 3763–3778, 3782–3791, 3794, 3795, 3800–3817, 3826–3839, 3842, 3843, 3846–3848, 3850, 3856–3859, 3864–3879, 3884, 3885, 3890–3895, 3902–3905, 3916–3929, 3946, 3972, 4020, 4130–4144, 4190–4195

Phase 6

939, 1000, 1001, 1008, 1010, 1016, 1018, 1035, 1036, 1039, 1040, 1042–1049, 1136–1138, 1174–1179, 1187, 1188, 1191, 1197, 1198, 1201, 1202, 1205–1207, 1337–1340, 1343–1355, 1401, 1463, 1522, 1523, 1539, 1551–1554, 1605, 1606, 1668, 1712–1726, 1731, 1734, 1736, 1778, 1799, 1800, 1803–1807, 1813, 1826, 2279, 2302, 2411, 2480, 2481, 2483, 2484, 3607, 3608, 3615–3621, 3647–3649, 3666–3677, 3688–3690, 3714, 3725, 3746, 3747, 3780, 3781, 3792, 3793, 3796–3799, 3840, 3841, 3844, 3845, 3849, 3854, 3855, 3860–3863, 3897, 3898, 3961, 4061–4064, 4145–4154, 4196–4203

Phase 7

578, 601, 740, 796, 817, 818, 822, 823, 833, 834, 845–847, 867–872, 885, 887, 903, 904, 914, 921, 922, 924, 925, 944, 975–977, 984–986, 991–993, 995–999, 1004, 1006, 1007, 1011, 1013–1015, 1017, 1019, 1020, 1021, 1037, 1038, 1133–1135, 1163, 1164, 1262, 1263, 1467, 1472, 1558, 1562, 1565, 1568, 1666, 1667, 1802, 1812, 1824, 1825, 2351, 2678, 3596, 3597–3600, 3610, 3611, 3626–3632, 3633, 3636, 3637, 3658, 3659, 3681–3687, 3692, 3693–3711, 3726, 3727, 3748, 3849, 4204–4209

Phase 8

232, 379, 494, 496–500, 511, 512, 586, 596, 621–623, 634, 636–639, 640, 644, 649–655, 659, 661, 663–669, 670–676, 682, 684–703, 705–735, 741, 743, 762, 779, 782, 785, 787, 791–795, 799, 800–806, 809, 815, 820, 821, 825–832, 835–843, 848–860, 862, 863, 865, 866, 873–884, 886, 893–902, 905, 913, 915–920, 923, 928, 934–938, 940–942, 945–968, 970, 971, 972, 973, 974, 1009, 1012, 1022–1034, 1041, 1158, 1604, 1732, 1827, 1828, 1831, 1833, 2361, 2362, 2475, 2482, 2679, 2680, 3324, 3472, 3473, 3474, 3644–3646, 4175, 4210–4212

Phase 9

405, 555, 557, 588, 591, 594, 597–599, 603, 616, 618–620, 629, 647, 660, 677, 678, 739, 742, 744, 747–761, 770, 771, 774–778, 780, 781, 783, 816, 819, 844, 861, 864, 888–892, 987, 988, 994, 1002, 1127, 1130–1132, 1140, 1141, 1148, 1149, 1151, 1157, 1822, 1823, 1847, 2284–2289, 2291–2293, 2295, 2298, 2299, 2352–2360, 2363–2369, 2401, 2409, 3477, 3548–3551, 3555, 3560, 3601–3605, 3612, 3660–3665, 4155, 4175, 4213–4217

Phase 10

589, 592, 595, 613–615, 624–627, 648, 656, 662, 680, 824, 833, 1621, 1733, 1735, 3304, 3306, 3318, 3546, 3547, 3552, 3553–3557, 3594, 3595, 3606, 3613, 3614, 3634, 3635, 3640, 3641, 3970, 3971, 3979, 4218–4226

Phase 11

223, 338–341, 345, 351, 352, 353, 354–356, 359–376, 381–389, 390, 391–398, 399, 400–404, 406–417, 422–430, 432–464, 465–468, 469–481, 482, 484–489, 493, 495, 501–504, 507, 509, 513, 515–528, 532, 535–554, 558–560, 562–565, 568, 569, 572–577, 579–584, 587, 590, 600, 602, 604–612, 628, 630–633, 635, 641, 643, 645, 646, 657, 658, 738, 746, 768, 769, 772, 773, 943, 2035–2045, 2047–2092, 2094–2122, 2124–2185, 2188–2190, 2198–2210, 2213–2235, 2237–2249, 2251–2278, 2280–2283, 2300, 2301, 2493, 2676, 2681, 3158, 3281, 3284–3289, 3307–3309, 3319–3323, 3326–3329, 3332, 3333, 3335–3369, 3373, 3375–3386, 3388, 3389, 3391–3408, 3410–3422, 3425–3470, 3475, 3476, 3478–3481, 3483–3486, 3488–3520, 3521–3545, 3553, 3558, 3559, 3562–3593, 3712, 3713, 3728, 3729, 3738–3745, 3930, 3941, 3942, 4156–4173, 4227–4229

Phase 12

310, 348–350, 357, 358, 374, 377, 378, 380, 406, 418–421, 431, 483, 490–492, 506, 529, 556, 642, 2030, 2034, 2046, 2186, 2187, 2192–2197, 2200, 2236, 2987, 2989, 3137, 3168, 3179, 3282, 3283, 3290, 3298–3303, 3305, 3313, 3322, 3325, 3370–3372, 3374, 3387, 3390, 3471, 3472, 3482, 3561, 4230–4232

Phase 13

335, 337, 2014–2016, 2021, 2022, 2024, 2026–2029, 2191, 2211, 2212, 2476, 2477, 3150–3153, 3157, 3186, 3187, 3190–3194, 3200–3210, 3216, 3275, 3276, 3291–3293, 3330, 3331, 3334, 4233–4238

Phase 14

079, 098, 103–105, 107, 110, 120, 121, 126, 128, 129–139, 146–148, 152, 155–157, 161, 163, 164, 174, 184, 187, 190, 191, 195, 196, 201, 207, 208, 217, 222, 224, 227, 228, 234–242, 248–251, 255, 258–285, 288–299, 303–309, 311–332, 334, 336, 342–344, 347, 505, 561, 679, 681, 683, 745, 1003, 1005, 1814, 1818–1821, 1936–1941, 1942, 1944–1950, 1953–1969, 1981–1985, 1989, 1991, 1994–2013, 2017–2020, 2023, 2025, 2032, 2033, 2093, 2395, 2915, 2917, 2919–2921, 2937, 2938, 2950, 2965, 2982, 2986, 2988, 3123, 3125, 3131, 3134, 3136, 3142, 3144, 3163–3165, 3167, 3169–3173, 3175, 3195, 3196, 3197, 3198, 3212, 3213, 3215, 3217–3220, 3224, 3273, 3274, 3278–3280, 3294–3297, 3310–3312, 3314–3317, 3409, 3487, 4239, 4240

Phase 15

088–091, 093, 094, 096, 102, 108, 111, 112, 124, 125, 127, 172, 177, 179, 180, 182, 189, 192–194, 199, 200, 204, 213–216, 220, 221, 225, 226, 243–247, 254, 256, 257, 1910, 1943, 1951, 1952, 1975–1980, 1986, 1990, 3143, 3161, 3162, 3199, 4241–4243

Phase 16

062, 063, 069–072, 074–076, 097, 106, 109, 113, 118, 119, 123, 140–142, 145, 150, 151, 153, 158, 160, 162, 165–168, 169, 173, 205, 206, 209, 229, 286, 287, 233, 333, 1903, 1904, 1906–1909, 1911, 1918, 1919, 1921–1935, 1971–1974, 1992, 1993, 2923, 2925, 2930–2933, 2959, 2960, 2978, 2979, 3139, 3147, 3149, 3175, 3178, 3211, 3214, 3221–3223, 3225–3572, 4176, 4244, 4245

Phase 17

077, 078, 197, 198, 218, 219, 2682, 3148\3156, 3166, 3180–3183

Post-Roman (Phases 18 and 19)

001–061, 064–068, 073, 080–087, 092, 095, 099–101, 114–117, 122, 143, 144, 149, 154, 159, 170, 171, 175, 176, 178, 181, 183, 185, 186, 188, 202, 203, 211, 230, 231, 252, 253, 300–302, 508, 510, 1128, 1129, 1815–1817, 1848–1879, 1880–1902, 1905, 1912–1917, 1920, 1970, 1987, 1988, 2701–2908, 2910–2914, 2916, 2918, 2922, 2926–2929, 2934–2936, 2939–2949, 2963, 2964, 2966–2977, 2980, 2981, 2983–2985, 2993–3048, 3050–3117, 3119, 3121, 3122, 3124, 3126–3130, 3132, 3133, 3135, 3138, 3140, 3141, 3145, 3146, 3154, 3155, 3159, 3160, 3174, 3176, 3177, 3184, 3185, 3188, 3189, 3277, 3423, 3424, 4077–4079, 4246

Group numbers

<i>Phase</i>	<i>Context (Group No.)</i>	<i>Contexts</i>	<i>Function\Identity</i>
1	4177	1754, 1756, 1760, 1761 1766, 1768, 1775\2640	Fills of Pit 1786
2	4178	1218, 1427, 1428, 1591– 1603, 1665, 1685	Fills of post-trenches in Building 3.1
2\3	2515	2518\2520, 2516, 2517 2519	Oven
2\3	2521	2518\2520, 2522	Oven
2\3	4179	3973, 3988, 4012, 4053 4067, 4117	Fill of post-trenches in Building 3.2
2\3	4180	3852\4051\4071, 3882\ 4073, 4049	Fill of possible post- trenches in Building 3.2
2\3	4181	3760\3761\3820\3913\ 3943\3944\4025, 3880 3759\3762, 3947, 3958 4021, 4095	Layers filling the majority of the slots in Building 3.3
2\3	4182	3966, 3968, 4023, 4103	Layers filling the slots in the south-west corner of Building 3.3
2–4	2672	1688\1841, 1752, 1753 1767\1842, 1843, 1845	<i>Via sagularis</i>
2–6	4174	1520\2491\4095, 1777 3719–3721, 3725, 3804\ 3809, 3896	Interval road
2–15	1847	207, 208, 212, 232, 342 405(=777, 778, 780, 781) 784	<i>Via praetoria</i>
3	4183	1180–1182, 1185, 1186, 1208, 1209, 1219, 1358– 1362, 1426, 1538	Layers filling post- trenches in Building 3.4
3	4184	1266\2618, 1296\2530 1297\2531, 2567, 2594	Layers filling post- trenches in Building 3.5
3	4185	2610, 2622, 2626	Layers filling post- trenches in loading bay part of Building 3.5
4	4187	1159, 1168, 1231, 1256 1286, 1288, 1439, 1560 1566, 1571	Fills of pits and gullies cut through demolition debris from Buildings 3.4 & 3.5
4	4189	2556, 2633, 2635	As 4187, but filling gullies cut at the north end of the site
5	4190	570, 571, 926, 1050\1837 1152, 1161, 1162\1729\ 2505, 1167, 1265, 1471 1590, 1837–1840, 2403 2404, 2489, 2494, 2495 2504\2506, 2508, 3571 3691, 3750, 3752–3756 3807, 3808, 3810–3817 3836, 3837, 3848, 3850 3902–3905, 3946, 3972 4020	Layers dumped down prior to the construction of Buildings 3.6, 3.7 & 3.8
5	4191	2296, 2550\2558\2560 2552, 2554, 2562	Layers filling post- trenches in Building 3.6

5	4192	2412-2416, 3622\3801 3715\3826, 3731\3758\ 3864, 3782, 3828\3830 3834, 3842, 3876	Layers filling post-trenches in Building 3.7
5	4193	2294, 2528, 3802, 3846	Layers filling possible post-trenches in Building 3.7
5	4194	1062, 1063, 1090, 1093 1106, 1150, 1165, 1830 1832, 1834	Layers filling post-trenches in Building 3.8
5	4195	2396, 2402, 2410, 2488 2503, 2509, 3717	Layers filling pits and gullies on either side of Buildings 3.6 & 3.7
6	4196	939\1010\1826, 1040 1136, 1137, 1174	Layers sealing Building 3.8
6	4197	3619\3690\3849, 3647- 3649, 3677\3688, 3689 3961	Layers sealing part of Building 3.7
6	4198	3616, 3618, 3621, 3746 3796	Layers filling new post-trenches in Building 3.7
6	4199	3666-3669, 3672-3675	Hearth in Room J
6	4200	1000\2279, 1001\2302 1047\1049, 3607, 3608 3676, 3714	Layers sealing Buildings 3.6 & 3.7
6	4202	1035, 1036, 1042, 1044 1088, 1138, 1175, 1178 1187, 1188, 1401, 1522 1553, 1605, 1668, 1720 1799, 1800	Layers filling post-pits in Upper Station House part of the site
6	4203	1043, 1191, 1197, 1201 1715, 1716	Layers filling post-holes in post-pits filled by 4202
7	4204	578, 601, 740, 796\2351 817, 818, 822, 823, 868 885, 903, 904, 944, 993 996-999, 1004,1011-1015 1017, 1019, 1020\1824\ 1825, 1021, 1133-1135 1163, 1164, 2280-2282	Layers deposited at the start of Phase 7
7	4208	834, 845, 991, 1006, 1666 3597, 3600, 3700	Layers filling post-pits cut through 4204
7	4209	869-871, 914, 921, 975 976, 995, 1467, 1558, 1562 1802, 3611, 3692, 3696 3698, 3704, 3706, 3708 3762, 3748	Layers filling pits cut through 4204
8	4210	596\877, 815, 820, 821 856, 857, 863, 856, 866 928, 941, 1009	Layers filling post-trenches in Building 3.9
8	4211	886, 923, 940, 967, 1603	Layers filling possible post-trenches in Building 3.9
8\9	4212	2361, 2475, 2482, 3324\ 3474, 3473, 3644-3646	Reconstituted interval road
9	4213	588, 591, 593, 594, 597 599, 603, 616, 647, 678 742, 767, 1822, 3477, 3548 3551, 3555, 3560, 3605	Building 3.9 demolition debris

9	4215	2352–2357, 2367, 2369	Layers filling pit cutting Road 4175
9	4217	2284–2286, 2291, 2292 2298	Layers filling slots to the north of Road 4175
10	4219	589, 592, 595, 614, 656 824, 1621	Layers filling pits in the south-west corner of the site
10	4220	615, 624, 1735	As 4219
10	4221	613, 617, 680	As 4219
10	4224	3547, 3595, 3970, 3971	Layers filling pits to the north-east of 4219
10	4225	3614, 3635, 3641	As 4224
10	4226	3552, 3554, 3556, 3606	Demolished hearths?
11	4227	223, 558, 581–584, 590 2280–2282, 2300, 2301 3592, 3593	Layers deposited prior to the construction of Buildings 3.10 & 3.11
11	3158	3285, 3395, 3539, 3582	Courtyard surface in Building 3.10
11	4228	602, 606\612, 608, 609 611, 628, 641, 643, 646 738, 2035, 2049, 2090\ 2493, 2100, 2155, 2205 2231, 2237, 2238, 2241 3281\3528, 3287, 3289 3308\3309\3332\3930 3498, 3512, 3581, 3712	Layers filling post-trenches in Building 3.10
11	4229	407, 461, 463, 502, 537 563, 607	Layers filling beamslots in Building 3.10
12	4230	3322, 3325, 3471, 3472 3842, 3283, 3290	Collapsed walls in Building 3.10
12	4231	310\350\492\506\2030\ 2046\2186, 2987\2989\ 3137\3168\3179\3282\ 3298–3301\3305\3307\ 3313\3370	Building 3.10 demolition debris
12	4232	348, 357, 378, 431, 2187 3303, 3371, 3372, 3374 3387, 3561	Burnt timbers under 4231
13	4234	335, 2022\3291,2026\ 3276, 2027\3291	Layers filling Pits 337, 2029\3275
13	4235	2014, 2024, 2191, 2211 2212, 2476, 2477	Layers filling Pit 2028
13	4236	3186, 3190, 3192, 3331	Layers filling pits in the north-east part of the site
13	4237	3202, 3204, 3206, 3208	As 4236
13	4238	3150, 3152\3153, 3200	As 4236
14	4239	079, 305, 306, 309, 313– 316, 347, 505, 561, 1952 3167, 3169, 3224	Layers deposited prior to the construction of Building 3.12
14	4240	2919, 2921, 2950, 3125	Layers forming surface in Building 3.12 Room Y
15	4242	214, 216, 243, 245, 1975 1976	Layers filling pits cutting surface in Room K ² in Building 3.12
15	4243	088, 108, 194, 225, 226	Building 3.12

		259, 1910, 1951, 1990	demolition debris
		3143, 3161, 3162	
16	4245	062, 069, 071, 072, 074	Layers filling Building
		076, 097, 106, 109, 113	3.12 robber trenches
		118, 119, 123, 140–142	
		153, 286, 1903, 1906–1909	
		1911, 1918, 1921–1923	
		1934, 1971, 1973, 1992	
		2923, 2931, 2933, 2960	
		2978\2979, 3214	

Building numbers

<i>Building</i>	<i>Context No.</i>
1	1709
2	2686
3	2694
4	1490
5	1414\2600
6	2324
7	2474
8	1115
9	640
10	376
11	–
12	128

Other numbers

Geological substrate

210, 1755, 1779–1798, 1801, 2990, 2991, 2992, 3910, 3957, 3984, 3985, 4070, 4094, 4113

'Cleaning' contexts

346, 704, 969, 1526, 1559, 1693, 1730, 2031, 2123, 2250, 2370, 3120, 3680

Unused/discarded contexts

814, 2663, 2664, 2909, 2923, 2924, 2926, 2951–2958, 2961, 2962, 3049, 3849, 3851, 4047, 4069

NOTES to Chapter 3

1. *Ex inf.* Mrs Wood of No. 4 Dock Street. Not recorded on plan.
2. On stratigraphic grounds Pits 3912 and 4115 may also be assigned to Phases 2 or 3.
3. It should be noted that, on stratigraphic grounds, Buildings 3.2 and 3.3 could also have been constructed in the succeeding phase.
4. e.g. Varro, *Rerum Rusticarum* LVII.3: 'Supra terrem granaria in agro quidam sublimia faciunt, . . . , guae non solum a lateribus per fenestras, sed etiam subtus a solo ventus refrigare possit.'
5. Pliny, *Naturalis Historia* XVI.15: 'Scandula e robore aptissima mox glandiferis aliis fagoque, facillima ex omnibus quae resinam ferunt, sed minime duram praeterquam e pino.'
6. Tacitus, *Annales* I.35.5.8: '. . . duritiam operum ac propinis nominibus incusant vallum, fossas, paluli materiae lignorum adgestus, et si qua alia ex necessitate aut adversus otium castrorum quaeruntur'. Vitruvius, *De Architectura* II.9.2: 'Ergo si ea ratione et eo tempore, quod est supra scriptum caeditur materies, erit tempestiva'.
7. The occurrence of Buildings 3.4 and 3.5 together clearly dispels the misheld conception that timber granaries with the trenches set along the longitudinal axis are earlier than those with their trenches set transversely.
8. A small quantity of carbonized grain was recorded in two post-holes at Pen Llystyn (Hogg 1968, 133).

9. Vegetius, *Epitoma Rei Militaris* III.3.15–16: ‘Frumenti vero et aceti vel vini nec non etiam salis omni tempore declinanda’.
10. I would like to thank Dr Glynis Jones for all her help and advice and without whom this report would not have been possible. Any errors are, however, my own.
11. This is probably an over-simplification as Apicius includes it as an ingredient in at least two recipes. We are grateful to Dr Edith Evans for this information (AGM/HSO-J ed.comm.).
12. A. E. van Giffen, *Jaarveslaag van der Vereeniging voor Terpenonderzoek 1940–1944*, 109, op. cit. Manning (1975), n.11).
13. *Naturalis Historia* XVIII: ‘Alibi contra suspendunt granaria lignea columnis et perflari undique malunt, atque etiam a fundo’.
14. We are reasonably certain that Building 3.5 would have been delimited to the north by the road located in the No. 4 Dock Street part of the site.
15. See note 5.
16. Both corridor and courtyard *horrea* are shown on a plan of Rome preserved on marble slabs and compiled during the reign of Septimius Severus. G. Carretoni, A. Colini, L. Cozza and G. Gatti, *La Pianta Marmorea di Roma Antiqua*, op. cit. Johnson (1983a, chapter 5 n. 157).
17. e.g. Columella, *De Re Rustica* I.13: ‘sed et lacibus distinguntur granaria ut separatim quaeque legumina penantur’.
18. Polybius, *Histories* VI.12.
19. Fink 1971, Nos 78, 79 & 81.
20. *Agricola* 22.2: ‘. . . nam adversus moras obsidionis annuis copiis firmabantur’.
21. Columella, *De Re Rustica* I. 14: ‘Parietes oblinuntur amurca . . .’
22. It should be noted that the pits and gullies described here as well as the surviving structural elements of Building 3.6 could on stratigraphic grounds have their origin in Phase 6.
23. See for example at Pompeii the House of Julius Polybius (IX, 13, 1–3) and the House of Paquius Proculus (I, 7, 1) (Spinazzola 1953, 75).
24. As in the house of the second *Cenaculum* (IX, 11, 4) at Pompeii (Spinazzola 1953, 716). Such tiles, though rarely recognised, are known from Britain: two examples are quoted by Brodrigg (Brodrigg 1987, 20) and a third was found at Caerleon in 1986 (Zienkiewicz b).
25. e.g. the House of Potitus Poppaeus (VI, 14, 37), the House of C. Caesius Restitutus (IX, 9, 6) at 4.8 x 5.7 m.
26. *De Architectura* I. 3.2: ‘Testudinata vero ibi fiunt, ubi non sunt impetus magni et in contignationibus supra spatiosae redduntur habitationes’.
27. The features located in this part of the site may on stratigraphic grounds also be assigned to Phases 8 or 9.
28. All of the contexts described here, with the exception of Pit 994\3601, the layers filling it, and the three stake-holes to the south of it, may on stratigraphic grounds also be assigned to Phase 10.
29. These contexts may on stratigraphic grounds also be assigned to Phase 10.
30. This plan is the standard one used for centurions’ quarters; the possible implications of this are discussed further in Chapter 4.
31. The presence of a courtyard (or other) water-tank is a key point in Schonberger’s argument (1979) for Valkenburg ZH Building 3.11a serving as a *fabrica*, but as Groenman-van Waateringe (1991) rightly points out: Building 3.11a at Valkenburg is of the same size as the *praetorium* at Oberstimm not the *fabrica*; there are only two finds of industrial waste from the whole building, and even for these the provenance is uncertain, as opposed to the large quantities of domestic finds which cannot be ignored; Valkenburg ZH is not a supply-base, but rather a frontline station, with a garrison probably commanded by a high-status officer expecting accommodation appropriate to his rank; a central water-basin does not obstruct the courtyard of a *praetorium* and there are a number of parallels – Vindobanda III, Obernberg, Oberscheidental, and Neckarbrucken (all *ex. inf.* D. Baatz).
32. On the destruction of this building by fire, it is interesting to note Vitruvius’ opposition to wattle-and-daub construction. *De Architectura* VIII. 20: ‘raticii vero velim quidem ne inventi essent; quantum enim celeritate et loci. Laxamento prosunt, tanto maiori et communi sunt calumitati, quod ad incendia uti faces sunt parat’.
33. For a similar arrangement see the House of the Stags at Herculaneum (Maiuri 1958, 247).
34. Vitruvius, *De Architectura* VI. 4.1.
35. Suetonius, *Divus Iulius* 46 records that Julius Caesar was notorious for carrying mosaics and *opus sectile* floors with him on campaign. These would have been prized personal possessions, and therefore subject to particular care in transport, use, and removal. The floors need not necessarily have been

- mosaics or *opus sectile*, tiles are another possibility. Timber floors would have been supported on points, and as the plaster came down to the clay surfaces this seems unlikely.
36. The term *praetorium* applies to any official residence, with an essentially private function. (See the article by W. Schleiermacher in *P-W Supplement Band IX* cols 1180–1181; and also Mommsen 1900, 437.) Here, however, discussion is restricted to the residences of commanders of auxiliary units and also those of the legionary tribunes. In Polybius' description (*Historiae* VI. 33.314) of the Republican camp the space in the front of the general's tent was termed the *principia*; other authors (e.g. pseudo-Hyginus) refer to the entire area, commander's tent and the area in front of it, as the *praetorium*. Early excavations of Roman military sites therefore tended to refer to the headquarters building as the *praetorium* until this was rejected by von Domaszewski (1899, 157) and subsequently confirmed by two important inscriptions that confirm the presence of *principia* and *praetoria* as separate entities in the same fort (*RIB* 1912, 2145).
 37. In the case of the 'Lunt' building the attached courtyard was not suggested by the excavator but can be reasonably inferred from the plan in the light of other examples.
 38. This corridor structure like the *praetorium* at the *numerus* fort of Kastell Hesselbach (Batz 1973, 31–2) has distinct affinities with the quarters of centurions in legionary barracks.
 39. Hence the downgrading of the *praetorium* at Housesteads when the fort was occupied by 'barbarian' units with a commanding-officer of lower rank.
 40. This is contrary to Vitruvius' recommendations; *De Architectura* VI.1.1.
 41. Since space within the fort was limited, it was the town-house which was most likely to be taken as the model for the *praetorium*.
 42. The presence of the commander's family was previously attested by two inscriptions from Birdoswald (*RIB* 1909 and 1919, and the occasional finds of women's and children's shoes. Two altars, *RIB* 1685 and 1686, from Vindolanda are dedicated amongst others to the *genus* of the *praetorium* and also to the household gods). However the contents of certain of the recently discovered writing-tablets from Vindolanda, located within the remains of the *praetorium* or in demolition deposits immediately outside the walls and from a building of contemporary date with those excavated at Loughor, have provided certain evidence for the presence of auxiliary commanders' wives, families, and social life (Bowman and Thomas 1986, 120–3; 1987; 126–30, 137–40).
 43. In the same way as in the use of public baths.
 44. For the personal staff of commanders in the *militia quarta* and *militia tertia* see von Domaszewski (1967, 40–59 and XIV–XIX). However, it is not certain where they were accommodated. It is more probable that they were attached to individual centuries (*turmae*) and accommodated in the barracks, rather than separately as a group of specialists. There is no reason to suppose that they would have been quartered in the *praetorium*. There is also no particular reason to suggest that they worked out of the *praetorium* rather than the *principia*. Although it has been tentatively suggested that there were offices in auxiliary *praetoria* (e.g. Schonberger 1978, 87), and also in some legionary tribune's houses, as attached blocks (e.g. Inchtuthil: Pitts & St Joseph 1985, 140), there is nothing to support this suggestion.
 45. *Scriptores Historiae Augustae, Vita Hadriani* 17.
 46. *RIB* 311.
 47. *Bellum Iudaeum* III. 97–100.
 48. Tombstones from Roman Britain frequently depict the deceased reclining alone on a couch to eat (e.g. Liversidge 1955, 3, pls 1–8, 10–12). This, however, seems to represent the deceased as dining alone ('the soul's celestial banquet in the other world': Toynbee 1964, 184), like the adolescent in the House of the Gem Cutter at Herculaneum who met his death on a couch in a small room with the remains of his lunch on a table in front of him (Deiss 1966, 100). The Roman custom for dining in company was for several people (notionally three) to recline on each of the three couches, according to strict rules of precedence.
 49. It was not infrequently necessary to make slight recesses in the side walls of rooms used for dining, so that the couches could fit properly, as for example in the *tablinum* of the House of the Carbonised Furniture at Herculaneum which was some 3.5 m.
 50. *De Architectura* VI. 7.4.
 51. Attempts, therefore, to identify particular rooms as living-quarters can therefore be rejected (e.g. in the first *praetorium* at Oberstimm where a group of rooms (2–5) which lay immediately to the north of the suggested dining-room were presumed to have been set aside for this purpose and a further group (16–18) as a sleeping area (Schonberger 1978, 79–81); Nanstallon (Fox & Ravenhill 1972,

74–6); and at Housesteads where it was suggested that the private quarters were situated in the quietest part of the building (Charlesworth 1975, 20)).

52. Vitruvius, *De Architectura* VI.5.1–2.
53. This arrangement seems intended to make the best use of the internal view, provided we are correct in our interpretation of F as a light-well.
54. Vitruvius, *De Architectura* VII.4.1–3.
55. Two stamped tiles were noted, and recorded on site, but both examples were lost in the fire before further work could be done on them. There is, therefore, no note of the fabrics on which the stamps were made. Only one is reported here.
56. The identification of the animal prints was kindly carried out by Peter Howlet of the Sub-Department of Vertebrate Zoology, National Museum of Wales.

CHAPTER FOUR

HISTORICAL AND TOPOGRAPHICAL SUMMARY

By A. G. MARVELL

SUMMARY OF PRINCIPAL PERIODS OF ACTIVITY (FIGS 86, 87, 88, 89)

The excavation sites at Loughor were recorded as discrete units. The recovered sequence of activity on each site has been separated into stratigraphic phases; these represent either a complete or partial change in the activity encountered on the particular site. The number of stratigraphic phases for each site reflects, to some degree, the location of particular sites. Thus certain sites (55, 57, 69) across the defences, although occupied chronologically longer than the principal internal area examined (Site 53) (as a result of the reduction of the fort in the second century) have fewer stratigraphic phases. The dating evidence from Sites 55, 57, and 69 has enabled the broad chronological framework for the occupation of the fort to be established; that from Site 53 provides the detail for the Flavio-Trajanic period.

Following construction, the occupation at Loughor can be separated into eight major chronological divisions (Periods); the first six associated with the primary fort, the last two with the reduced fort. On each site activity dated after the abandonment of the fort is grouped under Period IX; activity in each period (except IX) is summarised below and in TABLE 12, which includes Period IX (p. 217).

CONSTRUCTION AND PERIOD I (c. 73/4–c. 80)

Site phasing

Site 53

Phase 1 – Site clearance, terracing, marking-out features.

Phase 2 – Construction of Buildings 3.1 (granary), 3.2, and 3.3, ovens, *via praetoria*, *via sagularis*, and minor streets.

Site 55

Phase 1 – Site clearance, terracing, marking-out features.

Phase 2 – Construction of rampart, gate tower (Building 2.1), and Building 2.2.

Phase 3 – Construction of *via principalis* and *via sagularis*.

Site 57

Phase 1 – Site clearance, terracing, marking-out features.

Phase 2 – Construction of rampart, construction and use of Building 2.3.

Phase 3 – Pits, gullies, and other minor features.

Phase 4 – Construction of *via sagularis* and ovens.

Site 66

Phase 1 – Construction of primary defences.

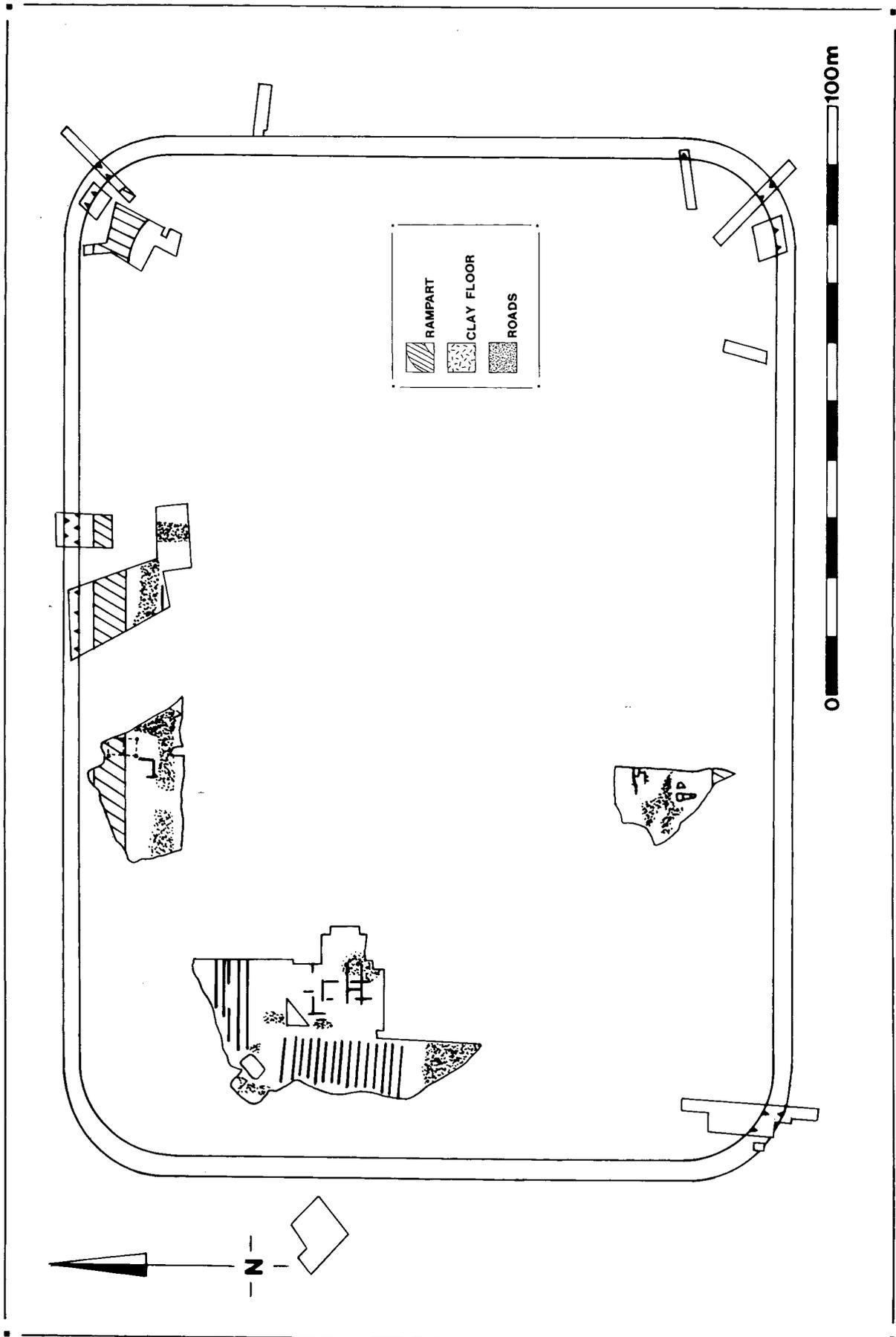


FIG. 86. Loughor: Period II.

Site 69

Phase 1 – Site clearance, terracing, marking-out features.

Phase 2 – Construction of primary defences, *via sagularis*, and *via quintana*.

Summary

Initially both surface vegetation and the turf cover were cleared, the latter presumably for re-use in the ramparts; there was no evidence for a buried turf-line from any of the sites. This was followed by the cutting of terraces into the natural substrate forming the glacial moraine on which the fort was sited, in order that the major elements of the defences, streets, and internal buildings could be more easily accommodated. The position of the terraces must have been surveyed in advance, although no evidence for this survived, perhaps as it had been removed during the terrace-cutting operation. Either at the same time or as a secondary operation, the position of the principal streets and buildings was marked out. Evidence for this survived on Sites 53, 55, 57, and 69 as lines of stakes or posts set in shallow trenches.

The sequence of construction across the fort is not certain. The defences, including the gate(s), were certainly constructed before the *intervallum* road and the *via principalis*, and by analogy it is probable that all the streets were laid out before the internal buildings were constructed. In the first use of the fort these certainly consisted of a granary (Building 3.1) and two small (?) stores buildings (Buildings 3.2 & 3.3) and an annex (Building 2.2) attached to the north gate (Building 2.1). Other structures assigned to this period are the probable ovens found on Sites 53 and the short-lived Building 2.3 on Site 57.

Dating

Although there are a number of certain pre-Flavian finds, principally coins (Nos 1–11; see commentary by Sell below p. 231), but also a Haltern 70 amphora (No. 4; see commentary by Evans below p. 326) and some mortaria (see commentary by Evans and Hartley below p. 315), which might lend support to the possibility of a pre-Frontinian construction of the fort, the overwhelming bulk of the pottery is Flavio-Trajanic and cannot support a Neronian or earlier establishment (see Webster below p. 339). The demolition of the first granary cannot be precisely dated, but is unlikely to be much later than 80.

PERIOD II (c. 80–c. 85) (FIG. 86)

Site phasing*Site 53*

Phase 3 – Replacement of Building 3.1 (granary) with Buildings 3.4 and 3.5 (granaries).
Resurfacing of *via sagularis*.

Site 55

Phase 4 – Resurfacing of *via sagularis*.

Summary

During Period II, the primary granary was dismantled and replaced by two new granaries (Buildings 3.4 & 3.5), perhaps but by no means certainly reflecting a change of garrison. The *via sagularis* here and on Site 55 was resurfaced. At the end of the period the buildings on Site 53 and the annex to the north gate were destroyed, the former possibly on evacuation of the fort. The ovens on Site 57 are presumed to have continued in use.

Dating

The demolition date of Buildings 3.2–3.5 cannot be precisely dated, but should probably not be extended much later than c. 85. The demolition of the ovens on Sites 53 and 57 probably also occurred before this date.

PERIOD III (c. 85–c. 100)

Site phasing*Site 53*

Phase 4 – Site clearance, fences, pits.

Phase 5 – Construction and use of Buildings 3.6, 3.7 (*Praetorium* 1) and 3.8.

Phase 6 – Rebuilding 3.7, construction of Post-pit group 4201.

Phase 7 – Levelling dumps, minor features, cremation burial (3610).

Site 55

Phase 5 – Resurfacing of the *via principalis* and *via sagularis*.

Site 57

Phase 5 – Pit Group 566, Pit 407 and other minor features.

Site 69

Phase 3 – Resurfacing of *intervallum* road.

Summary

The third period of activity saw an apparent downgrading of the status of the fort. Following clearance of the granaries on Site 53, only approximately half the available space was taken up in this part of the fort. Occupation here was represented by the construction of a small *praetorium* (Building 3.7), which in itself perhaps reflects the nature of the garrison (below p. 221), and two adjacent structures (Buildings 3.6 and 3.8). Elsewhere, although the principal roads were resurfaced, no building activity was discerned. The presence of a cremation burial on Site 53 above dumps of turf and other material implies an abandonment of the fort, even if only a temporary one, at the end of this period.

Dating

There is no evidence for any great hiatus between Periods II and III. A commencement date of c.85 is therefore probable, a *terminus post quem* for the end of this activity is provided by two coins of Domitian and one of Nerva; one of the Domitianic issues (Cat. No. 47) dating to 92–94 came from a Phase 5 pit-fill on Site 57, the other coins (Cat. Nos 44 and 51) came from the dumps sealing Building 3.7 on Site 53. A *terminus* for this period of activity cannot, however, be extended much later than 100.

PERIOD IV (c. 100–c. 105)

Site Phasing*Site 53*

Phase 8 – Construction of Building 3.9 (*Praetorium* ?), resurfacing of *via praetoria*, construction of minor roads to east of Building 3.9.

Phase 9 – Modifications to Building 3.9.

Site 54

Phase 1 – Construction of bath-house (Building 2.15).

Site 55

Phase 6 – Resurfacing of *intervallum* road.

Site 57

Phase 6 – Building 2.9 and reduction of *intervallum* road.

Site 69

Phase 4 – Repair of primary ditch, resurfacing of *via sagularis* and *via quintana*, construction of Buildings 2.6 and 2.7.

Summary

Period IV is associated with a major refurbishment of the fort, presumably associated with the arrival of a new garrison (below p. 221). All the principal roads (except the *via principalis*) were resurfaced or reconstructed and a new (?) *praetorium* constructed on Site 53 (Building 3.9). This went through at least one phase of modification, perhaps representing a change of use. Elsewhere two buildings (2.6 & 2.7) were constructed on Site 69, and another (Building 2.9) on Site 57. Part of the north defensive ditch was repaired. Even though the occupation in this period was apparently more intensive than that in Period III, it is clear, on the basis of the areas examined, that all the available space was not used. It is not certain when the bath-house was constructed, but such evidence as is available (see Webster below p. 355) implies an early Trajanic foundation and use and, therefore, construction of this building is best placed in Period IV.

Dating

The dating evidence for the closure of Period III, provides a commencement date for Period IV, which cannot be extended much beyond c. 105.

PERIOD V (c. 105–c. 110)

Site phasing*Site 53*

Phase 10 – Construction pits.

Phase 11 – Construction of Buildings 3.10 (*Praetorium* 3) and 3.11, resurfacing of *via praetoria*.

Phase 12 – Modifications to Building 3.10.

Site 57

Phase 7 – Construction of Building 2.4.

Site 69

Phase 5 – Resurfacing of the *via sagularis* and *via quintana*.

Summary

A new *praetorium* was constructed on Site 53 and a small structure erected above the *intervallum* road on Site 57. The replacement of the *praetorium* at the start of this period must certainly reflect a change of commander and presumably the garrison (below p. 221) as well. The roads on Site 69 were resurfaced.

Dating

The dating evidence from Sites 53 and 57 places this activity in the first decade of the second century and probably in the later part of this period.

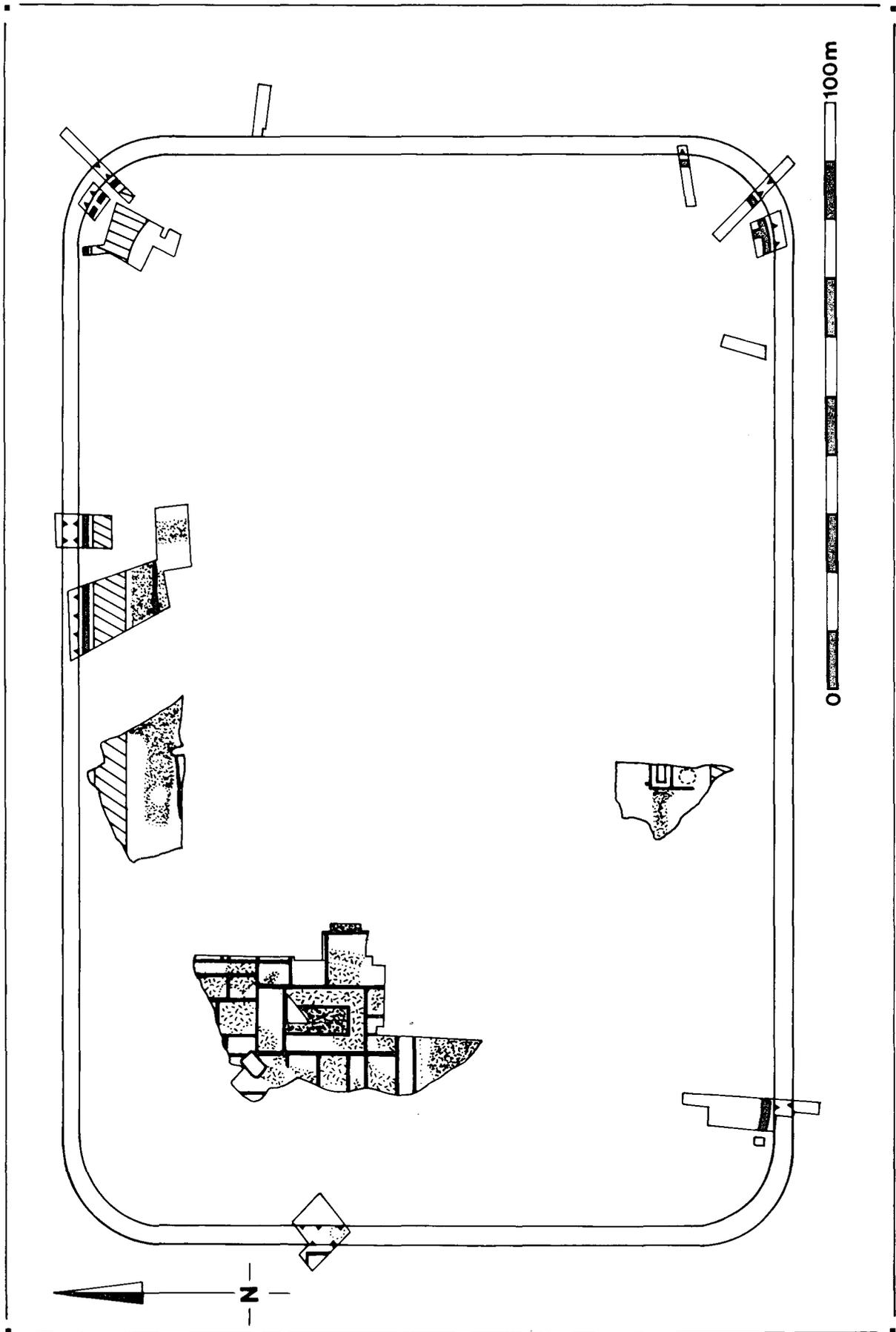


FIG. 87. Loughor: Period VI.

PERIOD VI (c. 110–c. 115\120) (FIG. 87)

Site phasing

Site 53

Phase 13 – Construction pits.

Phase 14 – Construction of Building 3.12 (*Praetorium* 4), resurfacing of *via praetoria*.

Phase 15 – Modifications to Building 3.12.

Site 54

Phase 2 – Timber-lined ditch cut.

Site 55

Phase 7 – Building 2.5 constructed, *via principalis* and *via sagularis* resurfaced.

Site 57

Phase 8 – Latrine and well constructed.

Site 66

Phase 2 – Secondary ditch cut to accompany revetment of defensive bank in stone.

Site 69

Phase 6 – Construction of stone revetment wall and new ditch, resurfacing of *via sagularis*, construction of Building 2.8.

Summary

Period VI saw a further major refurbishment of the fort, presumably associated with a change of garrison (below p. 221). The rampart was revetted and a new ditch cut on all sides of the fort; to the west this may have made the bath-house unusable. Internally, a new stone commander's house was built on Site 53 and all the major roads resurfaced. Building 2.4 on Site 57 was converted into a latrine and a well may have been subsequently dug to the south of this building. Parts of other timber-constructed buildings were located on Sites 55 and 69.

Dating

The finds from the contexts in this period cannot be extended much, if at all, into the Hadrianic period and a closure of this period much beyond c.115\120 is unlikely.

PERIOD VII (within c. 115\120–c. 260)

Site phasing

Site 53

Phase 16 – Robbing of Building 3.12 wall foundations, blocking of *via praetoria*, construction of reduced fort ditch.

Site 54

Phase 3 – Primary fort ditch filled.

Site 55

Phase 8 – Construction of west rampart of reduced fort and Building 2.10.

Phase 9 – Resurfacing of *via sagularis*.

Site 57

Phase 9 – Construction of west rampart of reduced fort and oven\kilns.

Site 66

Phase 3 – Primary fort ditch filled.

Site 69

Phase 7 – Levelling deposits.

Phase 8 – Modifications to the north rampart (?) palisade constructed.

Summary

For convenience we have grouped this activity together, but, for reasons discussed below, various elements could belong to Periods VI or VIII.

In Period VII the primary fort was replaced by a new establishment approximately two-thirds of the size of the original. A new line of western defences, represented by a clay-and-turf rampart located on Sites 55 and 57 and a ditch located on Site 53, was constructed; this was tied into the earlier defences to the north and south, which along with those to the east continued to be used. In the interior of the new fort the northern line of the *via sagularis* was resurfaced, and a new *intervallum* road constructed on the south and west perimeters. A building (2.10) of uncertain function, was constructed close to the defences on Site 55. Elsewhere activity seems to have been confined to structures and features perhaps associated with industrial activity.

Dating and discussion

Precise dating of the activity in Period VII is difficult. There is clearly a hiatus between the Flavio-Trajanic occupation of the primary fort and the better-dated activity in Period VIII (below p. 216), which must be mid- to late third century: however, there is sufficient evidence (Webster below p. 339) to suggest some activity in the later second century. This leaves us with a problem with regard to dating the reduction of the fort. There are a number of factors which have a bearing on this matter. Firstly Building 3.12 was deliberately demolished, there was no evidence for gradual decay and collapse at the end of Period VI. This may have occurred simply as a result of the withdrawal of the garrison at the end of Period VI, but it would certainly have had to be demolished before the construction of the western defences of Fort II. Secondly, the fort wall had also been deliberately slighted at the end of Period VI. Thirdly, there is no evidence to suggest that the western defences need have been constructed any later than c. 130. Fourthly, the main building activity in the reduced fort is confined to the later half of the third century and early fourth century.

Given the above there are a number of options, firstly that the fort was reduced at the end of Period VI. This would fit with the dating evidence for the construction of the new western line of defences, although the material here may simply all be residual, but it seems odd that the fort wall was also slighted at the same time. It is not inconceivable, however, that the defences were prepared to take a reduced garrison, but a change in plan resulted in abandonment before building work started in the interior, and in such an instance the reduction of the fort wall is explicable. That the fort, whether reduced or not, was abandoned by c. 120–130 is demonstrated by the presence of three cremation burials inside the north rampart (Ling & Ling 1979, 117).

The second possibility is that the fort was not reduced until the mid- to late third century when the main building activity within it occurred (Period VIII below). At first sight this option seems the more attractive, but it does not fit well with the dating evidence for the western defences of the reduced fort (above) or Building 2.10 (below). It is, however, certain that the defences of the reduced fort were modified in the mid- to late third century.

The third possibility envisages a reduction of the fort in the mid- to late second century. There is certainly sufficient evidence (above) to support such a date for the activity on Sites 55 (Phases 8 and 9) and 57 (Phase 9). Three options are, however, possible: either this short-lived

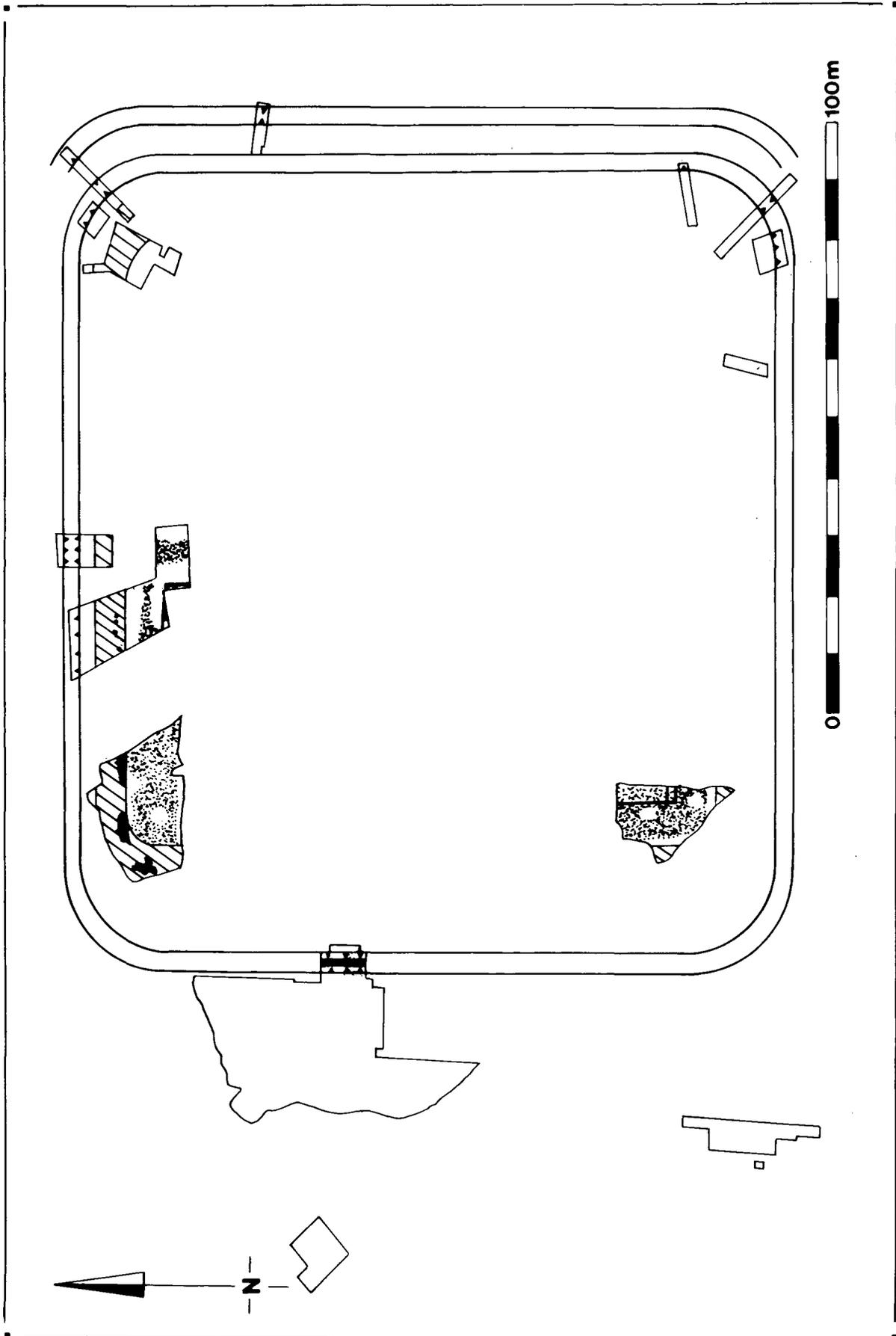


FIG. 88. Loughor: Period VIIa.

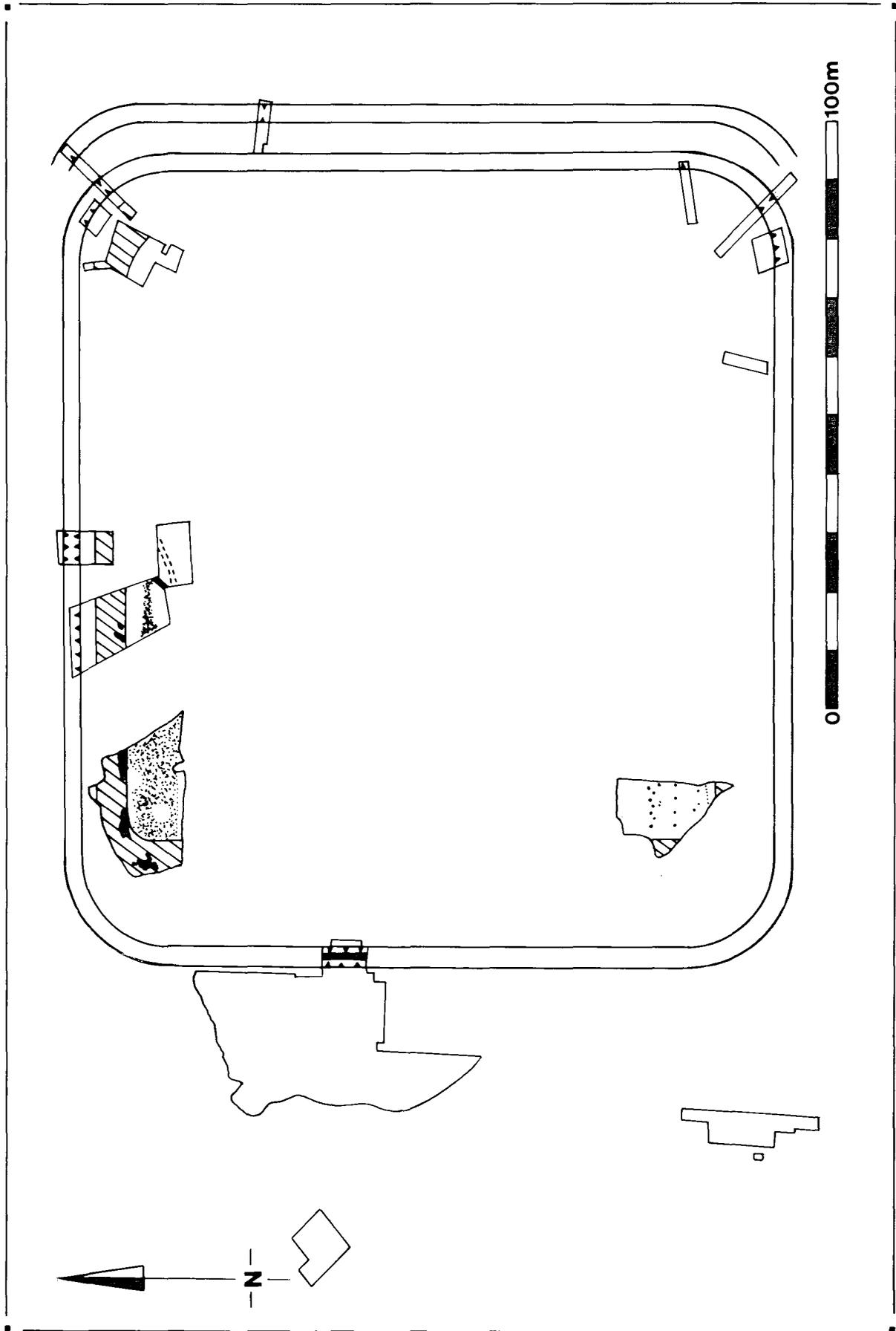


FIG. 89. Loughor: Period VIIb.

activity occurred simply within the confines of the abandoned primary fort, thereby implying that the reduction of the fort did not occur until the mid- to late third century; or this short-lived activity occurred within a reduced fort constructed *c.* 115\120–*c.* 130 and then abandoned before completion; or this short-lived activity is associated with the reduction of the fort in the mid- to late second century. Which option is preferable depends to some extent on the weight of evidence for an early second-century reduction as opposed to a mid- to late third-century reduction. One factor that needs to be considered is the dating of Building 2.10: there was little directly associated evidence for the date of this building, but that from stratigraphically associated contexts suggested a mid- to late second-century date for Phase 8 on Site 55. If this is correct then the building is oddly sited, as it was cut through the *via sagularis*, if it was built within the confines of the primary fort, but this is not the case if it was built within the reduced fort.

We cannot conclusively prove which of the possibilities for the dating of the reduction is correct, but we would argue that the evidence is in favour of an early second-century date for the construction of the defences of the reduced fort (II), followed by abandonment before the buildings in the interior were constructed, and that subsequently Fort II was briefly occupied in the mid- to late second century, before a more intensive period of occupation in the mid- to late third\early fourth century. However, it should be noted that our excavations were sited across the defences of the reduced fort and further work in the interior may help to elucidate a better chronology.

PERIOD VIII (*c.* 260–310+) (FIGS 88, 89)

Site phasing

Site 53

Phase 17 – Contexts above *via praetoria*, flue in reduced fort ditch.

Site 55

Phase 10 – Rampart capping wall and cobble casing, partial resurfacing of *via sagularis*.

Site 57

Phase 10 – Construction of Building 2.13 and new *via sagularis*.

Phase 11 – Modifications to Building 2.13, construction of ‘corndrying’ kiln.

Phase 12 – Construction of Building 2.14.

Phase 13 – (?) Resurfacing of *via sagularis*.

Site 69

Phase 9 – Building 2.11, new roads.

Phase 10 – Resurfacing of *via sagularis*, construction of Building 2.12, ditch filled.

Phase 11 – Rampart capping wall and cobble casing(?), partial resurfacing of *via sagularis*, drains.

Summary

Period VIII is represented by activity within the reduced fort that can be dated to the mid- to late third\early fourth-century re-use of the second fort. On the north side, this was represented by the construction of a stone wall on the crest of the rampart, the rear of which was encased with cobbles. At least two phases of building activity were detected here on Site 69, the last being replaced by two drains. On the south side of the fort, a new *via sagularis* was constructed, fronted by a timber building (2.13). The road and building were subsequently replaced by a new structure, marked by stone-packed post-pits.

Although we have grouped this activity into a single period, that in the interior can be subdivided (VIIIa, VIIIb). VIIIa consists of Buildings 2.11, 2.12, and 2.13, VIIIb consists of Building 2.14 and the drains on Site 69.

Dating

This activity is associated with a late third-century\early fourth-century re-occupation of the fort. The commencement date is uncertain, but is unlikely to have been much earlier than 260: two coins of Carausius (Nos 74 and 75) provide a secure date of 291 before which Building 2.14 could not have been constructed. Occupation cannot be extended much into the fourth century. The latest numismatic evidence is a coin of Constantine II as Caesar (324 – 330) recovered by Lewis in silt above the demolished north-east corner-tower (Ling & Ling 1973, 118).

TABLE 12: LOUGHOR: MAJOR PERIODS OF ACTIVITY

		PERIODS								
		I	II	III	IV	V	VI	VII	VIII	IX
<i>P</i>	Site 53	1-2	3	4-7	8-9	10-12	13-15	16	17	18-19
<i>H</i>	Site 54				1		2	3		4
<i>A</i>	Site 55	1-3	4	5	6		7	8-9	10	11
<i>S</i>	Site 57	1-4		5	6	7	8	9	10-13	14-15
<i>E</i>	Site 66	1					2	3		4
<i>S</i>	Site 69	1-2		3	4	5	6	7-8	9-11	12

FORT I
FORT IIa
FORT IIb
POST-
ROMAN

THE LAYOUT OF THE FORT

FORT I

Size and topography

The fort at Loughor is of the rectangular playing-card shape typical of so many Roman auxiliary stations. Although there are some slight discrepancies along the length of the defences, due no doubt in part to the difficulties posed for the Roman surveyors by the local terrain, the average length and width between the ditches is calculated at 172 m and 125 m respectively. An area of some 2.15 ha was, therefore, enclosed by the ditches. The breadth is slightly more than two-thirds the length. The legionary *mensores* presumably intended the overall dimensions to be in the order of 120 m by 180 m (approximately 3 1/3 *actus* by 5 *actus*). The internal area (i.e. that enclosed by the *intervallum* road) is estimated as 145 m by 85 m, with a probable intended dimension of 144 m by 84 m (4 *actus* by 2 1/3 *actus*) or 1.23 ha. In Period VI the defences were extended westwards by *c.* 13 m. This increased the overall fort area between the ditches to 2.31 ha, and perhaps added *c.* 0.05 ha to the available building space within the perimeter road.

Defences

It is assumed that the fort was originally entered through four gates. The only one to be located was set approximately half-way along the north side and probably led out onto a ford (or bridge) across the river. A second entrance is presumed to have existed on the opposite side of the fort. This gate would have led out onto the marshland formed by the course of the River Lliw, on the edge of which the fort cemetery may have been established (below). The subsidiary role of this entrance is perhaps emphasised by the blocking of the *via sagularis* on the nearby 1 and 3 Dock Street site by the construction of Building 2.4. Other entrances into the fort probably existed in the centre of the west and east sides. That on the west side would have given access to the bath-house in Periods IV, V, and possibly VI, and perhaps also to wharves, the other would have been sited close to where Castle Street crosses the line of the fort defences; here the road from Neath ought to have entered the fort. As yet no turrets have been found and only a single corner-tower. This was located in the south-east angle (Lewis 1975). Ling and Ling

suggested (1973, 108–9) that all traces of the north-east angle-tower had been removed by later activity. Any trace of the angle-towers at the other end of the fort would have been destroyed in the mid-nineteenth century. The type and form of the single gate excavated have already been discussed at length; it need only be noted here that the other portals would not necessarily have been identical.

Streets

Even though only parts of the fort have been examined, sufficient is known to suggest a preferred scheme for the original road system. The principal elements of this system in the first fort would have consisted of the *via principalis*, *via praetoria*, *via quintana*, *via decumana*, and the *via sagularis*. The *intervallum* road was identified on Sites 53, 55, 57, and 69. On the north side of the fort it remained in the same position, but on the south side (Site 57) its alignment shifted slightly to the north, and as noted above it was subsequently blocked (p. 68). On Site 53 the *via sagularis* was only present in Phases 2 and 3, after which it was presumably moved slightly westwards, a factor that may eventually have dictated the slight westwards extension of the defences in Period VI. The *via principalis* was located on the Castle Street site where it crossed the *intervallum* road to enter the north gate. The eastern limit of the *latera praetorii* would have been defined by the *via quintana* a small section of which was located on Site 69 where it met the *intervallum* road. This road was presumably joined from the east by the *via decumana*. The *via praetoria* was located at the extreme southern end of Site 53. A further road which probably crossed the full width of the fort and thereby divided the *praetentura* was located in the 4 Dock Street part of Site 53. Minor roads (*via vicinariae*) were found in some of the phases on Site 53, and would also have been laid out elsewhere in the plots defined by the principal thoroughfares. This road system remained largely unchanged, apart from minor alterations such as the widening of the *via praetoria* and the slight shift in the alignment of certain sections of the *intervallum* road.

Buildings

These arrangements provided a division of the fort into three. The *latera praetorii* was defined by the *via principalis* and *via quintana*, the *retentura* lay to the east of the *via quintana* and the *praetentura* to the west of the *via principalis*. Although the local topography did not preclude a regular plan in respect of the defences, it affected the internal arrangements. The *principia* would have been sited in the centre of the fort under the site of St Michael's Church, and at the highest point of the moraine. However, from the apex of the gravel spur the ground slopes far more steeply to the north and south than to the east and west, consequently the other principal buildings – the *praetorium* and granaries normally found in the central range of the fort – were sited at the west end of the *praetentura*. Although only one half of this area of the fort was examined, we suggest that the whole of the western two-thirds of the *praetentura* was occupied by these buildings. Thus when the *dextra* section of the *praetentura* was occupied by granaries, the *sinistra* area would have contained the *praetoria*, and vice versa. A similar alternation of these buildings was noticed through various stages of rebuilding in the *latera praetorii* at Corbridge. This led Daniels to suggest (Gillam 1977, 55–6) that this occurred as a result of needing to keep the old granaries in commission whilst new ones were built on the site of the former commander's house, but this was clearly not the case here, except possibly at the end of Phase 3 on Site 53, as granaries were succeeded by granaries and *praetorium* by *praetorium*.

The position and alignment of the barracks and other buildings within the fort is more difficult to determine, as no complete plans have been recovered. However, where traces of possible buildings were located on the excavations (Sites 55, 57, 69) opened out across the defences, these were for the most part aligned east–west (the exceptions being one or two small structures located on Site 57). This alignment would have been determined by the local topography. If these linear buildings had been laid out on a north–south alignment, it would have been necessary to have built them on split-levels; while feasible this would have entailed additional and needless difficulties in their construction.

Given the probable internal division of the fort outlined above, it seems probable that all, or, at least the majority, of the barracks would have been located in the *retentura*. The width of the plot in the *praetentura* between the road to the east of the granaries and the *praetoria* and the *via principalis* is at 30 m likely to have been too small; very few barracks of the Flavio-Trajanic period have been found that are less than 30 m long, and these have mostly been recorded in Germany (see, for examples, Davison 1989, 80). In the same period the majority of barracks fall within the range *c.* 30–50 m in length (Davison 1989, 79–80, FIGS 2.3, 2.4) with widths ranging from 5–12 m. The variations in width reflect the different types of barrack plan. Barracks of this order could easily have been accommodated in the *retentura* at Loughor, and depending on the unit stationed at Loughor (for the possibilities see below), stables, stores, or workshops could have been situated in the *latera praetorii*, or the eastern part of the *praetentura*.

Elsewhere along the defences a stone-built corner-tower was found in the south-east angle (Lewis 1975), but not in the north-east angle (Ling & Ling 1973, 108–9); this was probably constructed at the same time as the fort wall, but probably continued in use. A sequence of timber-constructed buildings, perhaps service structures, was found to the rear of the north-east angle of the defences (Ling & Ling 1973, 111–116 and 118 for a Flavio-Trajanic date).

To conclude, despite the difficulties of the local topography, the first fort at Loughor was probably not particularly unusual in plan. In overall terms it was well proportioned with a regular street plan. Internally, at least initially if our arguments above are correct, it was possible to keep some degree of regularity in the location of the buildings, the main exception being the need to site the granaries and *praetorium* at one end of the fort rather than in the *latera praetoria*. Although, many similarly sited forts have highly unusual plans, at two (Housesteads and Lease Rigg) regularity was maintained (see Davison 1989, 105–106 with reference to forts with irregular plans as a result of their siting); at Loughor it seems probable that at least the different building types were kept together.

FORT II

Size and topography

The second fort was almost square (133 m x 125 m between the ditches) and almost three-quarters the size of its predecessor, encompassing an area of 1.66 ha between the ditches. In terms of Roman measurements this equates to almost 3½ *actus* in either direction. The internal area (i.e. that enclosed by the *intervallum* road) is estimated at 90 m by 90 m, an area of 0.81 ha or in Roman measurement terms 2½ *actus* in either direction. The internal layout of the fort is more difficult to determine.

Defences and streets

The stone corner-tower identified by Lewis (1975) may have continued to be used; a solitary post-hole may have indicated the presence of a further tower at the north-west corner, but the evidence is too scant for this suggestion to be advanced with any certainty. It also seems likely that the original south, east, and north gateways continued to be used, but not necessarily on the west, where this would have led out onto the earlier line of the *via praetoria*, which may have been blocked (above p. 185). Although this would have left a fort with an unusually small *praetentura* (or *retentura* if the second fort faced east rather than west), there was no evidence to suggest that the gateway on Site 55 had been blocked and more particularly to suggest that the *via quintana* of the first fort had been re-utilised as the *via principalis* in the later establishment. In the latter instance, if this had been the case, then evidence for a gate ought to have been found on Site 69 opposite the point where this road met the *via sagularis*. The *intervallum* on three sides of the fort continued to be used but a new section detected on Site 57 was laid inside the west defences of the reduced fort.

Buildings

Too little of the interior of the second fort has been examined for either the position or type of

buildings present to be proposed with any degree of certainty. It is probable that the *principia* continued to be sited in the centre of the fort under the site of St Michael's Church, perhaps re-oriented to face east. The main unit accommodation must have been in the eastern half of the fort. Other buildings, perhaps including the *praetoria* and granaries, which need not have been as large as in the primary fort, must now have been sited on either side of the *principia*. These arrangements are of course speculative, but it may be noted that the Severan reduction at Castell Collen (Evelyn-White 1914, RFW 2, 74–7) resulted in the complete removal of the earlier *retentura* leaving the former *latera praetorii* and existing buildings in one half of the new fort, and the new garrison accommodated in the former *praetentura*; an occurrence not that dissimilar to that here, where the *praetentura* rather than the *retentura* was shortened, but the principal buildings retained at the end of the fort rather than in a new central range.¹ The buildings (2.10, 2.11, 2.12, 2.13, 2.14) partly uncovered through our work are probably barracks, stable, or stores.

THE GARRISON

FORT I

It seems probable that during the fort's lifetime it was occupied by a variety of units, as it was apparent from the excavation of Sites 53 and 57 in particular that on some occasions not all the available space was utilised, but on others it was necessary to encroach onto the *via sagularis*. As no epigraphic evidence has yet been found to indicate the garrison of the fort, it is not possible to suggest the exact unit occupying the fort at any given time. However, in the absence of other factors such as the complete internal plan of the fort or at least the plan of some of the barracks, which would be helpful in determining the garrison (Breeze & Dobson 1974, 13–19; Hassall 1983, 96–131), the overall size of the fort can be used to suggest tentatively the possible original garrison. Loughor at 2.15 ha (Periods I–V) and 2.31 ha (Period VI) compares well with its nearest neighbours Neath 2.26 ha, Llandovery 2.38 ha, and Coelbren 2.14ha.

Bennet (1986) reporting a preliminary statistical survey of auxiliary forts and their garrisons or potential garrisons notes a general trend, from cluster analysis, that forts of 2–4 ha were appropriate in size for *cohors peditata quingenaria*, *cohors peditata miliaria*, *cohors equitata quingenaria*, and *cohors equitata miliaria*. Forts for similar units also varied in size from province to province: thus in Britain all the forts known to have been garrisoned by quingenary strength non-mounted cohorts fall in the range 1.38–3.11 ha, but in Germany these forts are larger; for those garrisoned by an *ala quingenaria* the range in Britain is 2.34–3.14 ha. It must, of course, be remembered also that there are many examples where parts of different auxiliary units and/or legionary detachments were accommodated together.

In the case of Loughor, of the various possible regiments, the quingenarian *cohors equitata* and milliary *cohors peditata* are the most probable assuming that they were at full strength. The fort would have been too small to hold a *cohors miliaria equitata* or *ala*. It is also unlikely that the fort was designed to accommodate a *cohors quingenaria peditata*. A unit of this size would only have required space for six barracks in addition to the principal buildings. At Loughor the barracks for such a unit would have been easily accommodated in the *retentura* and, with the position of the principal buildings more or less certain, this would have left approximately a third of the internal area free, although part of this might have been taken up by stores and other minor buildings. A *cohors miliaria peditata* would have required space for at least ten barracks. If these were of average width, c. 9–10 m, and separated by *via vicinariae* 2–3 m wide, then four pairs of barracks aligned *per strigas* could have been contained in the *retentura* but the others would have to have been laid *per scamna* in the central part of the fort, but this could only have been done with difficulty for the reasons already given (above p. 218). The remaining space in the *latera praetorii* and the eastern part of the *praetentura* would have been occupied by stores and ancillary buildings. Although the earliest documentation (*CIL* xvi. 31) for a milliary infantry cohort dates to 85, these units were probably, but not certainly, a Vespasianic creation (Holder 1980, 6). However, milliary units are far less common than the quingenary cohorts and

alae. Three well-known diplomas from Britain (*CIL* xvi. 43, 48, and 51) for the years 98, 103, and 105 show only one milliary infantry and two mixed units as opposed to 28 quingenary cohorts or *alae*. Although these documents do not show the whole provincial force but only those units where men were being discharged, it is clear that milliary units are in the minority, and it is difficult to argue that Loughor was designed to hold such a garrison.² A more likely unit would have been a *cohors equitata quingenaria*. This unit would have required six barracks for the centuries and two for the four *turmae*. The *milites* would have had to be accommodated in the *retentura* and the troopers could have been housed in the remaining two barracks here, if these buildings were of the order indicated previously. Alternatively the *turmae* could have been housed in four barracks laid *per strigas* in the central part of the fort and their mounts in the stables in the *retentura*. If this garrison was disposed as suggested, then other buildings such as stores, latrines, workshops, and a hospital could have been fitted with ease into the remaining available space in the *latera praetorii* and the eastern part of the *praetentura*. Some circumstantial evidence reinforces the possibility that at least the initial garrison was most probably a *cohors equitata quingenaria*. In both Phases 2 and 3 on Site 53, the granaries would have provided sufficient annual capacity for a quingenary unit (using Manning's criteria (1975, 115–18)); in Phase 3 the eastern part of Building 3.5 may have been used to store hay, and this, together with the presence of quantities of barley, perhaps indicates the presence of a whole- or more probably part-mounted unit. Horse accoutrements were found across the fort in all periods of use, but only two items can be associated with the initial period of occupation (Copper-alloy Cat. Nos 138, 143).³

There can be little doubt that the garrison of the primary fort changed on a number of occasions. This almost certainly occurred in Periods III, IV, and VI, and may also have necessitated the rebuilding detected in Periods II and V. The garrison in these instances is virtually impossible to detect with any degree of certainty in the absence of the excavation of the barracks, but some general observations can nevertheless be made. The apparent reduction in the amount of space required in Periods III and IV may reflect the presence of a reduced garrison and this is discussed further below (p. 227). In the case of Periods V and VI, the construction of Buildings 3.10 and 3.12 must reflect the likelihood of a full garrison. Consideration of the available space (above p. 217) is a determining factor in the possible garrison, which ought to have been similar to that occupying the fort in Periods I and II. Building 3.12 must, however, have been built by an equestrian officer of high status with attendant social aspirations.

As we have already argued (above p. 179) the *praetoria* were custom-built and therefore must to some extent reflect the status, and perhaps also the aspirations, of the occupier. Buildings 3.7 and 3.9 (at least in its first phase of use) should therefore have been occupied by persons of lower status or rank than those living in Buildings 3.12 and 3.10. Buildings 3.7 and 3.9 were occupied *c.* 85–*c.* 105. Buildings 3.10 and 3.12 were occupied *c.* 105–*c.* 115/120. We have already noted that Building 3.9 has affinities with centurions' quarters, but for Building 3.7, and particularly in its second phase of use, we know of no parallels in a military context. Although the command of units in the *auxilia* in the Flavio-Trajanic period was restricted to equestrian officers normally, but not necessarily, progressing through the *tres militiae*, it was still occasionally possible for legionary centurions to command these units, usually at the end of their military career (Holder 1980, 75–83). However, the examples are few, and by the end of the first century the career of equestrian officers in the *auxilia* had become completely divorced from the centurionate and the *primipilares* (Holder 1980, 142–3). It was still, however, possible for a legionary centurion or decurion to be placed in temporary command of an auxiliary unit as a *praepositus*. The centuries or cohorts of the legions could also be seconded from the main unit, either in times of war as vexillations, or in peacetime for building and other activities. Buildings 3.7 and 3.9, if correctly identified as *praetoria* and there seems little reason to doubt this, are particularly small when compared with most other auxiliary *praetoria* (see FIG. 82) built in the late first/early second century. The implication must be either that a legionary centurion or decurion has been placed in temporary command at Loughor or that part of a cohort has been seconded here as a temporary garrison. There is no epigraphic evidence to assist us here, and

clearly further excavation in the interior of the fort may help to resolve this matter, but there is certainly something unusual occurring. Consideration of the known historical context in this period may, however, assist us. This is discussed further below (p. 227), but it may be noted here that pressures elsewhere in the Empire in the late 80s necessitated the withdrawal of part of the British garrison, and led to the abandonment of Agricola's conquests in Scotland. The South Wales garrison would not have escaped the effects of these troop transfers and movements. In a territory that had only been conquered some ten years previously, and was still under military control, it would not have been feasible to abandon forts without giving up the conquest, but it may not have been possible to maintain the level of garrison established here in the governorship of Frontinus. In such circumstances the splitting of some units, whether legionary or auxiliary, and the placing of experienced officers, probably legionary centurions, in command of these detachments may have been the best solution to ensure continuing control of recently won territory. The Loughor evidence does not, of course, prove that this occurred, but would fit well within such a scenario; and if this was the case, then we should not be surprised to see such officers taking the opportunity to provide themselves with accommodation that would be recognisable as being in accord with their rank but reflect their slightly enhanced status.

FORT II

The size of the reduced fort militates against any garrison other than a *cohors quingenaria peditata*. This would, however, apply only in the earlier period of use; the garrison during the late third/early fourth century, and particularly following the Diocletianic army reforms, is less certain.

THE ENVIRONS OF THE FORT

THE APPROACHES TO THE FORT

The only known road leaving the fort is that to the east running towards Neath, which follows the line of the modern A470 to Swansea. Three practice camps have been recognised in close proximity to this route; two (Glam Invent 743–4), 23 m and 25 m square respectively, are sited to the north of the road on Garn Goch Common (SS 6080 9718), the other (Glam Invent 742), a much larger example encompassing an area of c. 0.24 ha on Stafford Common to the south of the road (SS 5914 9713). The lines of other routes can only be conjectured. A road, which would have joined the Neath road just outside the fort, may have run north-eastwards along the river bank at least as far as Hendy, the next feasible river crossing point some six miles upstream, and perhaps from here continued northwards as far as Llandeilo to link with the main Camarthen-Brecon route. There would have been little point in siting the fort at Loughor if the river crossing could not have been utilised, and a road running towards Loughor can be traced from Carmarthen, where it follows the B4309 until the junction with the B3406 to Hendy is reached: further sections of the road have yet to be confirmed, but it may follow the A484 between Llanelli and Loughor, alongside which Roman material was found during the construction of the Trostre steel works (Ling & Ling 1973, 104).

The sea/river approaches were, of course, a critical factor in the siting of the fort. The position of the wharves is, however, unknown; these may have been removed by topographical changes to the estuary or by the construction of early post-medieval docks below and above the fort site.

THE (?)VICUS AND CEMETERIES

Although a *vicus* may have developed at Loughor its position is unknown, but it could only have been sited to the east, north-east, or south-east of the fort. Chance finds in this area include quernstones (Morgan 1899, 21), a coin of Antoninus Pius,⁴ and a possible pottery kiln, on land to the rear of 'Pen-y-Banc' on the north side of the A470 (SS 5658 9815), excavated by members of the Llŵchwr Society in 1954 following the structure's discovery in 1934. Finds from the site in 1934 included fragments of Roman pottery and tile dated by Nash-Williams to the late first/early second centuries.⁵

Other chance finds have been recovered in the marshes to the south-west of the fort. These include samian ware recovered from a drainage channel (SS 5632 9785) (Ling & Ling 1973, 104, 130–2) and a coin of Trajan found in 1828.⁶ In the same area two cremation burials were discovered during survey by the Royal Commission (Glam Invent 733) and may indicate the general area of a cemetery.

Other finds from the immediate vicinity of the fort consist of chance discoveries through metal-detecting activities, and include a dupondius of Trajan dated to 112–115 (unpublished),⁷ and two denarii with a copper-alloy disc brooch and spoon, and also other coins.⁸ Two coins, one of Constantius Gallus (351–354), the other of Valentinian II (378–383), have been recovered from the west bank of the river near Bynea; the provenance of these is uncertain and they may have formed part of a hoard.⁹ Further afield, but within the area of influence of the fort, a hoard covering the period 69–158 was recovered during the construction of Gowerton County School for Girls (SS 5999 9572),¹⁰ and a dupondius of Antoninus Pius was found during the building of Gorseinnon hospital.¹¹

SOURCES OF SUPPLY

A full integration and statistical analysis (cf. Casey *et al.* 1993) of the evidence provided by the various specialist reports for the sources of supply and the implications for economic activity, both within the fort and its local environs, has not been possible within the post-excavation framework and funding limits. Some aspects, however, have been discussed by individual specialist contributors. In particular P. V. Webster has been able through statistical analysis across the periods of occupation to establish trends for the supply of coarse pottery to the fort with both chronological and economic implications, and this forms a framework within which similar studies of the other finds could be accommodated. There would undoubtedly be considerable value in undertaking such an exercise, as has been clearly demonstrated by the Segontium report. However, a few general points and considerations may be noted here.

Building materials

The primary fort structures were of timber and earth construction, with material probably obtained locally. The question of the organisation of timber supply to the army in Britain has been addressed by Hanson (1978, 293–305). It seems probable that most parts of the province would have been able to furnish the requirements of the army. In South Wales birch, oak, alder, hazel, and ash were all available. Unfortunately the large collection of timbers collected from the fire-destroyed *praetorium* (Building 3.10) were all lost in the fire of 1983, before even preliminary identification had been undertaken. On the question of whether the timbers arrived unseasoned as argued by Hanson (1978) or were previously stockpiled (Hobley 1982, 257–72), the evidence from Loughor is equivocal. Although most different types of military buildings show a broad conformity in plan, the surviving structural arrangements often, as is the case also here, seem to reflect an *ad hoc* construction programme, with irregular spacing of uprights, misalignment of foundation trenches, and the occasional use of different construction techniques in the same building. However, one of the second series of granaries (Building 3.4) was clearly built according to a given design, but not necessarily using pre-fabricated timbers. It is perhaps significant that generally such structures for which pre-fabrication can be best argued are granaries (Richmond & MacIntyre 1939, 151) or gateways (Hobley 1982, 271, n. 12). Both types of structure are of relatively simple design and could be quickly erected. Provision of effective protection to fort entrances and safe storage of supplies would have been matters of priority in the construction or refurbishment of a fort and it is, therefore, perhaps not surprising that certain of these structures have simple designs suitable for pre-fabrication.

Both turf, from the clearance of the site, and clay, from the marshes of the River Lliw, were available for the construction of the ramparts; and the latter for the walls and floors/sub-floors of buildings and the construction of hearths and ovens. No Roman quarries have been located in the vicinity of the fort, but Millstone Grit, Limestone, and Pennant Sandstone were locally

available, and all were used throughout the fort. Some of the limestone was evidently processed, as a kiln was located outside the north-east angle of the defences (Ling & Ling 1973, 110–11). Although ditch or pit sand (*harena fossica*) was preferred in the making of mortar, river (*harena fluviata*) or sea sand (*harena marina*) were acceptable alternatives,¹² provided additional materials, such as crushed potsherds were added to the mix.¹³ Cobbles and gravel for use in roads and foundations would have been obtained from the glacial moraine on which the fort was sited.

Provisions

The range of edible supplies obtained by the Roman army was far more varied than may be assumed from the writings of ancient commentators. The potential range has been discussed by R. W. Davies (1971), and more recently reinforced and enhanced by some of the Vindolanda writing-tablets (Bowman & Thomas 1983). The range of edible supplies recorded at Loughor has been discussed in part in detail by certain of the specialist reporters (Probert, Evans, and Sadler), but some wider aspects are explored here.

In Wales until recently the provisioning of forts, and in particular the effects on local economies, has not been well understood, although the results of the work at Segontium (Casey *et al.* 1993, 75–7) have gone some way to redressing the balance at least for North-West Wales. Here it is clear that the grain was locally supplied, but there are no comparative bone assemblages from native sites to indicate whether the major meat-producing animals were of local origin.

At Loughor by far the greatest amount of evidence comes from the Flavio-Trajanic occupation. Evidence from possible local producer sites is scant. Both the Vale of Glamorgan and Gower are fertile lowland zones, which have been subjected to widespread agricultural exploitation from the Neolithic onwards. The Vale in particular has produced widespread evidence for Romanisation, but the evidence from the Gower Penninsular is less certain, although the large numbers of later coin hoards are clearly indicative of substantial settlement and exploitation (Robinson 1988). More significantly, although there is not necessarily a hiatus in the occupation of native sites, the main effects of Romanisation in the Vale of Glamorgan, particularly in terms of adoption of building styles, only appear to start in the second century following the reduction in the military garrison (cf. Robinson 1988, xii–xiii).

Grain

At Loughor as at Segontium, the grain had been fully processed before storage, with spelt as the dominant crop but evidence also to suggest that barley, as animal fodder or for malting, was separately stored. Bread wheat was also present but it is not certain whether this was a separate crop or a contaminant of spelt. The double-threshing of the crop resulted in the removal of weeds and other contaminants, consequently it is difficult, if not impossible, to detect the point of origin. The double-threshing of the crop may, however, be a point in favour of local production as this would have rendered the crop more vulnerable to insect or fungal infestation, and the risk would have been exacerbated if the supplies had to be transported for any distance. In North Wales the grain was stored unthreshed on at least some native sites, and the processing of the material is seen as taking place between the point of supply and delivery (Casey *et al.* 1993, 75).

In South Wales, there is little empirical evidence for grain production at native sites in the Flavio-Trajanic period except at Whitton in the Vale of Glamorgan (Jarret & Wrathmell 1981). Here a sequence of small granaries, reminiscent of their larger military counterparts, were constructed from *c.* 115 but abandoned before 160, by which time the South Wales auxiliary garrison had been almost entirely removed (Davies, J. L. 1980). The granaries at Whitton may reflect Romanisation simply in terms of the adoption of a building style to enhance an existing functional need: the effective storage of grain for the indigenous community; or perhaps are indicative of increased demand, necessitating a greater and also more efficient storage capacity.

Animals

The range of animals consumed at Loughor is far more diverse than has been encountered on the excavated local Romano-British sites (e.g. Whitton: Kinnes 1981, 232–8; Biglis: Whitbourne 1988; Llandough: Whitbourne 1988), and as at Segontium the comparanda is of little use in identifying sources of supply (Casey *et al.* 1993, 76–7). The collection is mostly from the Flavio-Trajanic occupation and statistical analysis to show varying trends in the age of death or proportions of cattle to sheep or pigs over time has, therefore, not been undertaken. As is common, the larger-boned vertebrates form the majority of the collection, although the total sample has no doubt been affected by varying rates of post-depositional survival and collection during excavation.

However, the bulk of the evidence comes from Site 53, which for most of its use was occupied by a succession of *praetoria*, and therefore the wide range of species present may be no more than an indication of the higher quality of life enjoyed by the garrison commander and his family. Cattle appear to have led useful working lives before butchery and at least some of their meat was probably smoked (Sadler, below p. 401). Cattle and pigs were probably brought to the site, but the certain presence of foetal lambs suggests that sheep may have been reared close to the fort. As has been noted on a number of sites, marginal resources were also exploited, at a site close to the coast the presence of fish, shellfish, and even the whale should come as no surprise: other meats obtained through hunting include deer, hare, gamebirds, and fowl.

Pottery and glass

Evidence from the survival of containers again overwhelmingly relates to the Flavio-Trajanic period. Little needs to be added to the analysis by Webster (p. 333), and the comments of Dickinson (p. 296), Evans (p. 325), Allen (p. 387), and Evans and Hartley (p. 315). The range of sources, as might be expected, is widespread and in some cases may even reflect where a garrison, or officers, were moved from (see Evans & Hartley p. 315). There are also a few unusual vessel sources, but these do not militate against either the overall chronology, or trends of supply. The incidence of local pottery production (Fabrics a and b) in the early years of occupation and the similarity of the local mortaria Fabric C3 to Fabric b, is important as the producer sites are not known. Although, on the evidence of coin hoards these sites ought to have existed in the Gower Peninsular or in the South-East Dyfed, their precise locations are not known.

We have stated elsewhere (above p. 180 etc.) our case that at least one of the *praetoria* (Building 3.12) was the residence of a high-status occupier, but two other *praetoria* (Buildings 3.7 and 3.9) may have been the residence for a commanding-officer of lower rank. Webster notes in his analysis of the coarse pottery by function (below p. 340) that the pottery is dominated by the needs of the kitchen rather than those of the table, and in particular the relative lack of finewares, even given the less-prolific occurrence of such wares in the late first/early second centuries. Examination of the analysis of coarse pottery sources for Site 53 (TABLE 26) does not aid the issue. Could this in some cases, given the short spans of occupation, mean that such wares did not outlive their lifespan, and were removed when a particular garrison departed? Or is it really a reflection of the status of the commander? Perhaps so, in the case of Buildings 3.7 and 3.9, but if our argument for the quality of surroundings in which the occupier of Building 3.12 lived is correct, then not only may he have eaten using metal tableware, but would also have expected high standards of cleanliness, with detritus removed well away from his living space. Here, we may also note the wide range and quality of the glass tableware items from the site (Allen p. 387). However, the ratio between kitchen and table wares is consistent for Site 53 and other areas in the fort, and therefore the implication that the needs of the kitchen were the primary concern for the occupiers of the fort cannot be ignored.

Other equipment

The range and sources of equipment present are discussed and reported in detail by Lloyd-Morgan (p. 234), Scott (p. 288), Dawson (p. 273), Greep (p. 409), Bailey (p. 386), and

Parkhouse (p. 411). As a collection; this is the largest yet recovered from an auxiliary fort in Wales, and is one of the larger assemblages from similar sites in Britain. The range of material present naturally reflects the overriding military purpose of the site, and includes a number of pieces of exceptional intrinsic interest. As might also be expected, sources of supply are widespread, and here no further comment is merited.

THE HISTORICAL CONTEXT

The occupation of the first fort has been divided into six chronological periods (above); these can be grouped into three larger chronological divisions – Periods I and II, Periods III and IV, Periods V and VI – each of which reflects significant changes in the history of the fort's occupation: these and the evidence for pre-establishment activity need to be considered in a wider context.

Loughor is one of a series of auxiliary forts,¹⁴ in South-East Wales, whose construction is conventionally assigned to the first years (73–4) of the governorship of Julius Frontinus, following the incorporation of the southern and western parts of the territory of the *Silures* into the Roman province. We have no literary evidence, apart from brief comments by Tacitus,¹⁵ for the nature of these campaigns or the reason behind them. The campaigns of Gallus, Veranius, and Suetonius had certainly pacified the tribe, and even if at least part of their territory had not been incorporated into the province, Roman influence and control must have extended well beyond the frontier defined by the Clyro-Abergavenny-Usk-Cardiff axis. Whether this frontier was maintained after the Boudiccan revolt is uncertain; the evidence from Usk suggests at least a reduction in garrison, if not abandonment, but Cardiff might have continued (Davies, J. L. 1980, 260–1). Evidence for occupation of forts beyond this line is scant, and is extremely unlikely in the case of Neath (Heywood & Marvell 1992, 290). This still leaves Llandovery, where the earliest fort can be linked with a few pre-Flavian sherds (RFW2, 95–6). This fort was sited at a key control-point on the Towy-Usk river corridor separating the Glamorgan uplands from those in Mid-Wales. Llandovery is easily linked to Loughor by the valleys of the Rivers Loughor and Cennen, which is a tributary of the Towy. I have argued elsewhere (1992, 291–2) that the corridor between Neath and Coelbren, reinforced with the small installations at Hirfyndd and Rheola was not only a major campaign route as attested by the marching camps at Coelbren, Melincourt, and Blaen-Cwm-Bach but after the Frontinian conquest served to control and limit east–west movement between what was formerly Silurian and Demetaean territory. At Loughor, there is some evidence for pre-Flavian activity. Whilst it is not sufficient to argue for pre-Frontinian construction date, it could reflect earlier military activity in the vicinity of the fort. If so, do we perhaps glimpse here an earlier attempt to exploit the Loughor–Llandovery axis, perhaps in an attempt to encircle and separate the *Silures*? The notion is tempting, but the evidence is extremely limited; moreover both forts would have been too isolated from the main frontiers, without other stations in between, and there is no evidence yet for these. The alternative is to accept that unusual items in the material evidence, and this is perhaps easier for the ceramics, tell us more about the continuity of supply to sites than their dating.

The Frontinian conquest probably consisted of a short season of campaign to remove any final opposition, and was a necessary precursor to more difficult operations against the *Ordovices* in Mid- and North Wales completed by Agricola.¹⁶ Although operations against the *Brigantes* had been conducted by Cerialis before the arrival of Frontinus, it was necessary to complete the conquest of Wales and consolidate the Roman hold on Wales before a push northwards could begin. It is against this background that the foundation of the fort at Loughor is placed.

In South Wales, the forts and roads established by Frontinus formed a network controlling the main routes around and through the South Wales uplands and coastal plain. Loughor lay at the western end of this system; the relationship to Llandovery has already been noted, to the east the axis between Loughor and Neath would have exerted control over Gower, and to the west the fort would have overlooked the coastal plain and foothills of South-East Dyfed.

After construction, no doubt carried out by staff of *legio II Augusta*, who were established at Caerleon shortly before the final conquest of the *Silures*, the prime duties of the initial garrison

would have been policing and exploiting the resources of the newly won territory. In Periods I and II, which span the years *c.* 75–*c.* 85, we need not doubt that the fort was fully garrisoned, and the likelihood that the garrison was a part-mounted unit here makes eminent sense, given the need to respond to any local difficulties quickly. The garrison may have changed once during this period, at the start of Period II, as perhaps indicated by the rebuilding of the granaries on Site 53. Unless this was no more than a result of a need to replace these structures as a result of wear and tear, particularly since they would have been exposed to the prevailing south-westerly winds. If not, then a possible historical context would have been Agricola's advance into Scotland. What the evidence from Loughor reinforces is that despite the need to deploy troops to the north – and a hiatus in the occupation of some forts in Mid- and North Wales may have been connected with these events (Davies, J. L. 1980, 264) – the situation in South Wales was not yet secure enough to allow a depletion of the garrison.¹⁷

It is in Periods III and IV, *c.* 85–*c.* 100/105, that we see something unusual happening at Loughor. We have argued at length (above p. 221) that Buildings 3.7 and 3.9 (at least in its first phase of use) may have housed commanding-officers of lower rank, serving as *praepositi* over a depleted garrison. Even if this is not correct, it is still apparent from the limited glimpses into the interior of the fort that the full available space was not taken up. In contrast with Periods V and VI where buildings are found next to and even across the *via sagularis*, on Sites 55, 57, and 69, these areas, and more significantly parts of Site 53, were unoccupied in Periods III and IV. The fort was clearly not abandoned for any length of time, apart from perhaps a brief hiatus at the end of Period III when a burial was cut on Site 53, therefore some other explanation needs to be sought. It is well known that pressures on the Danube frontier in the mid-80s caused the withdrawal both of *legio II Adiutrix* in 86 or 87 and also a number of auxiliary regiments at about the same time from Britain, thereby depleting the probably already overstretched garrison, precipitating the abandonment of Agricola's gains in Scotland and necessitating the re-garrisoning or re-construction of forts in Lowland Scotland or Northern England to maintain the reduced frontier. Shortfalls in manpower could not however be compensated for by reducing the Welsh garrison further (Davies, J. L. 1980, 264).¹⁸ Nevertheless, the effects may have been such that in the following decade available resources had to be spread more thinly. Loughor seems to be an example of this, but without more extensive investigation of the interiors of their forts the full picture will not be apparent.¹⁹

In the later Flavian period the Welsh garrison began to be thinned, a gradual process which was to continue into the first quarter of the second century (Davies, J. L. 1980, 264–5). Although literary evidence does not assist us in the last decade of the first century and early years of the second, the picture in the frontier zones seems to be one of consolidation. There were nevertheless problems in Lowland Scotland at the turn of the century, and it is not until the successful outcome of Trajan's Dacian wars that attention could be turned to Britain. In Wales some further reduction can be detected from either the closure of some forts or the construction of smaller forts above their predecessors, but in South Wales only Cardiff appears to be abandoned and the garrison was for the most part maintained until *c.* 120, before needs elsewhere outweighed the continuing military control of South Wales. This is reflected at Loughor in Periods V and VI by the return of a full garrison and the subsequent consolidation in stone.

The occupation of the reduced fort is more difficult to place in historical context. Both Periods VII and VIII were short-lived. Here, we may note that the activity may be paralleled at Neath. There the fort was certainly garrisoned in the mid-second century, perhaps between 155 and 160, although a wider date range can only be given with any degree of certainty (Heywood & Marvell 1992, 290). Some reoccupation in the same period has been suggested for other sites in Wales (Davies, J.L. 1980, 269; Webster, P.V. 1984, 289–90), but with few exceptions this activity is short-lived and must reflect no more than the temporary stationing of troops before dispersal elsewhere. What it does tell us, however, is that these stations had remained under military control, even if they were not maintained.

The more certain re-occupations at Loughor in the late third and early fourth centuries compliments less-well defined activity at Neath (Heywood & Marvell, 1992, 291–2) in the same period. These forts must have formed part of a system of coastal defence along the Bristol

Channel, centred on the Saxon Shore type fort at Cardiff (RFW2, 70; Heywood & Marvell 1992, n. 11) and founded during the 'Gallic Empire' or by Probus. Outside Cardiff, Loughor has produced the most certain evidence for Carausian activity, but here as at Neath the site was probably finally abandoned sometime after the Empire was re-united by Constantius, and cannot have extended much into the fourth century.

CONCLUSION

Loughor formed part of a network of forts established by Frontinus to police the South Wales heartland of the Silures. The small quantities of pre-Flavian finds need not necessarily indicate an earlier occupation. The first decade of use probably saw a full garrison in post, perhaps replaced on one occasion, but a reduction in the size or type of force stationed at the site in the last fifteen years of the first century and the early years of the second century may be a microcosm of problems faced elsewhere. The return of the full garrison, the consolidation of parts of the fort in stone, and the continuing occupation into the early years of Hadrian, is well-paralleled elsewhere in South Wales, where a long period, nearly 50 years, of military control was needed before the garrison could be safely reduced. Some short-lived re-occupation can be detected in a reduced fort in the second half of the second century, perhaps associated with the need to house temporarily units withdrawn from Scotland, rather than in response to any local needs. Further re-occupations can be more certainly assigned to the late third century, when the site may have formed part of a system of coastal defence. The fort was abandoned in the early fourth century and played no further part in the military occupation of Roman Wales.

We have shown that extensive excavation of the defences can reveal a wealth of construction and other detail, which is not always apparent through limited area sections. In the interior of the fort open-area excavation has revealed a complex stratigraphic sequence which reflects the fluid dispositions of the Roman army in the Flavio-Trajanic period. The apparent continuous rebuilding and re-organisation, which must reflect the regular movement of troops, detected here and at the neighbouring fort at Neath cannot be localised phenomena, but for the most part remain to be identified elsewhere. We believe that there is sufficient evidence to support our identification of buildings in the south-west quarter of the fort as the residence of the unit commander and we have drawn attention to the fact that these would have been custom-built to reflect the tastes, background, and rank of the occupier. We have also drawn attention to the need to look at the literary and architectural evidence for similar structures in the Mediterranean to understand how these buildings were designed, constructed, and more importantly used. Just as the activities of the Roman army in Britain cannot be appreciated without recourse to the wider literary, epigraphic, and archaeological background, likewise the same evidence must be used to provide an appropriate contextual background for its buildings and their uses, and in the case of *praetoria* this has not always been the case. In this instance archaeology and an appreciation of how Roman social and domestic life functioned may have more to tell us about the daily relationships of a Roman commander with both his household and his officers and troops than other avenues of inquiry.

NOTES to Chapter 4

1. The fort at Tomen-y-Mur was also reduced by removing the *retentura* (RFW 2, 111–13).
2. Jarrett (1966, 28–34, RFW2, 14–18, in both cases following Birley 1952, 17–19) argued that the units in these diplomas could be assigned to 'legionary commands' based at Caerleon or Chester, and on this basis attempted to assign the units to various forts where there was not already existing epigraphic evidence. However, more recently Holder (1980, 167–8) has shown that the diplomas only relate to the garrison of a province as a whole and not to an individual legion. Even so these documents still show a preponderance of quingenary units and in particular *cohortes equitatae*, which make up 42 per cent of the total, even though we appreciate that the diplomas only give part of the provincial garrison.
3. These of course need not necessarily indicate the presence of cavalry as mounts would have been

provided for the officers and other animals used for transport, although the latter would have had different types of harness.

4. Found during construction work at the front of the Lower Loughor Post Office, *J Rom Stud* xvii (1927), 186.
5. The information on the discovery and excavation (unpublished) is held under file PRN 220w in the West Glamorgan County Sites and Monuments Record retained by the Glamorgan-Gwent Archaeological Trust.
6. OS 6'' maps, County SMR PRN 199w.
7. County SMR PRN 1449w.
8. *Arch Wales* xxxi (1991), 32.
9. *Ex inf.* Mr Davies, the owner.
10. *Bull Board Celt Stud* ix (1939-41), 292.
11. *Archaeol Cambrensis* ix (1936), 311.
12. Vitruvius, *De Architectura*, I.2.8.
13. Vitruvius, *De Architectura*, II.5.1.
14. The others are Neath, Caerphilly, Coelbren, Penydarren, Cardiff, and Gelligaer (cf. RFW2, Davies, J. L. 1980).
15. *Agricola* XVII.
16. *Agricola* XVIII.
17. There is no evidence for abandonment of any of the South Wales forts in this period, but the fort at Neath was probably slightly reduced in size, probably as a result of the arrival of a new garrison (Heywood & Marvell 1992, 289).
18. The auxiliary station at Usk, if it was not a supply depot for *legio II Augusta* was founded sometime shortly after 86.
19. The neighbouring fort at Neath appears to have been fully occupied in this period.

CHAPTER FIVE

THE FINDS

INTRODUCTION

By S. H. Sell and A. G. Marvell

The finds reports here have been ordered into four major groups: Metalwork – Coins (S. H. Sell), Copper alloy and Silver (G. Lloyd-Morgan), Ironwork (M. Dawson), Inlaid Plate from a First-Century Dagger Sheath (I. R. Scott); Pottery and Ceramic Lamps – Samian (B. Dickinson), Amphorae (D. R. Evans), Mortaria (D. R. Evans and K. F. Hartley), Coarse Pottery (P. V. Webster), Ceramic Lamps (D. Bailey); Glass – Glass (D. Allen), Intaglios (M. Henig); Objects of Bone and Stone – Skeletal Remains (J. L. Wilkinson), Faunal Remains (P. Sadler), Objects of Bone and Antler (S. Greep), Stone Objects (J. Parkhouse). The reports on the Burnt Grain (F. Probert), Wall-plaster (A. G. Marvell), and Brick and Tile (E. M. Evans) are included in Chapter 3 above. Reports on slag, daub, flint and material of medieval or later origin, apart from a few items noted in the metalwork reports below, are retained in the archive.

In most instances the finds publication reports represent only a small percentage of the total assemblage. The iron dagger scabbard plate, coins, skeletal remains, and intaglios are reported in full. For other classes of material, the percentage reported ranges from 5–25 per cent of the total assemblage. Selection of items for publication has been made in agreement with the relevant specialist. Only rare examples or those without well-illustrated parallels have been illustrated (in figure or plate), apart from some of the pottery groups which form in their own right important assemblages. Wherever possible, we have tried to indicate the full range of material available for study.

In conjunction with the specialists, we have edited the publication reports in order to present the information in a consistent manner, that should not only assist the reader in linking the information here with that in the structural report but also from one finds-report to another.

The site order (55, 69, 66, 54, 57, and 53) observed in the structural report is followed here: whether the material is presented by site and phase group – samian and coarse pottery; or by historic period – the coins; or by function – copper alloy and silver, ironwork, lead, worked bone objects, stone objects; or by class or fabric group – the mortaria, amphorae; or by type – the glass; or as a simple catalogue – inlaid dagger scabbard plate, ceramic lamps, intaglios, skeletal material. The exception is the report on the faunal remains, in which material is summarised by type/class with examples/exceptions from each site noted as appropriate.

The copper alloy and silver, ironwork, lead, worked bone, and stone reports are presented to follow the same thematic order by function as the small finds from Colchester reported by Crummy (1983). However, we have merged her Categories 7 and 8, have not used her Categories 9, 12, 14, 17, and items under her Category 18 are referred to under the heading miscellaneous or miscellaneous and *incerta*. The idea behind doing this was to assist the reader in identifying the full range of objects with particular types of function (e.g. items of dress or personal adornment), whatever the material, recovered from the excavations.

With the exceptions of the skeletal remains, inlaid dagger scabbard plate, ceramic lamps, and intaglios, each report includes a brief introduction/summary, with fuller discussion sections interposed in the catalogues as appropriate.

In each report catalogue the numbering is as in the following example 1.53\1029 (064) where 1. = the catalogue number, 53 = the site number, 1029 = the context number, and (064) the individual finds number. As the samian and coarse pottery are grouped by site and phase, the site numbers are omitted from the individual catalogue entries.

THE METALWORK

THE COINS (FIG. 90) By S. H. Sell

Roman coins¹

A total of 79 coins of the Roman period were recovered from the excavations at Loughor, of which 75 could be identified. As might be expected, activity represented by coin loss is greatest in the Flavian (49%) and Trajanic (19%) periods, which together account for 68 per cent of the identifiable total. The coin evidence supports other indications that abandonment took place *c.* 120; the only evidence for a continued presence at Loughor during the second quarter of the second century was provided by a sestertius of Hadrian (now unfortunately lost) from Site 69, which can be dated to the years 134–138.² The presence of a very small quantity of Antonine samian should, however, not be disregarded, and may indicate continued occupation at some slight level within the area of the reduced fort. Coin losses resume, except on Site 53, during the Gallic Empire period with issues of Gallienus (sole reign) and of Claudius II, and are concluded by five coins struck under Carausius; losses during this period of reoccupation account for 16 per cent of the total. The absence of coins from Site 53 is entirely consistent with this area being excluded from that of the reduced fort.

It will be noted that the excavations produced eleven pre-Flavian coins, representing 15 per cent of the total, but, more significantly, no fewer than nine of these would have been demonetised at the time of the earliest supposed date of military occupation, *c.* 73–74. Although these coins span a period of *c.* 270 years, their loss is most likely to have occurred during the Neronian period at the time when the latest of these, two Claudian copies, were in circulation. These Claudian issues are unlikely to have been lost much after their replacement by official bronzes of Nero, upon which production would have ceased, although it is perhaps significant that one example has been pierced, perhaps for later use as a talisman.³ Material evidence of pre-Flavian finds is otherwise almost entirely absent apart from a substantial part of a Haltern 70 amphora, and there is no certain structural evidence; the only early coin, however, which may not be residual (No. 4) was recovered from the rampart make-up along with brick, tile, and daub which must have belonged to the fort construction camp if not to an earlier period. It is interesting to speculate on the likelihood of some form of pre-fortification activity at Loughor, even if only in the nature of passing trade, from which these early coin losses have resulted.

FIG.90 presents a summary of the coin losses from the major sites at Loughor as a histogram, and TABLE 13 reproduces this information in tabular form, with details of comparative material from Roman sites in South Wales and elsewhere.

Post-Roman coins

One coin of medieval and three of post-medieval date were noted; they appear as entries within the appendix to the main catalogue.

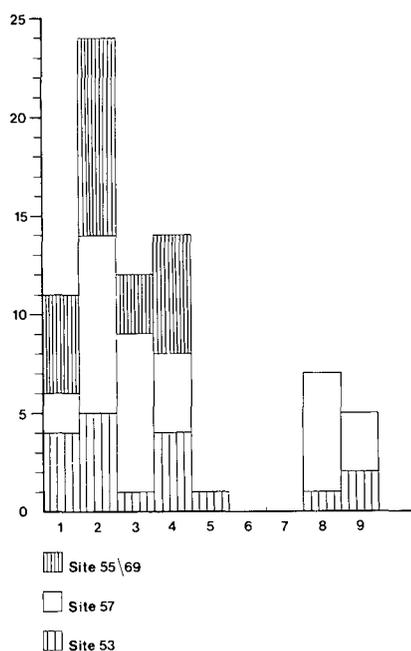


FIG. 90. Loughor: Histogram of coin losses.

TABLE 13: COINS FROM LOUGHOR BY ISSUE PERIODS

Period	Loughor sites						Comparative material					
	55	69	57	53	55\69	53\57	Total	RG	FB	B	U	C
Republican	1	—	2	3	1	5	6(1)	3	1	5(2)	15(2)	1(1)
Imperial	1	2	—	2	3	2	5(1)	3(2)	2(2)	2	239(33)	6(4)
Pre-Flavian	2	2	2	5	4	7	11(2)	6(2)	3(2)	7(2)	254(35)	7(5)
Flavian 1	4	1	9	10	5	19	24	37	18	12	12	22
Flavian 2	—	1	8	3	1	11	12	17	9	10	12	19
Trajanic	1	3	4	6	4	10	14	11	14	10	13	41
Hadrianic	—	1	—	—	1	—	1	4	9	5	7	16
Gallic Empire	1	—	6	—	1	6	7	77	28	3	15	48
Carausian	1	1	3	—	2	3	5	21	8	6	1	2

Sources of Comparative Material:

RG = Caerleon, Roman Gates (McKay 1991)

FB = Caerleon, Fortress Baths (Boon 1986)

U = Usk (Boon & Hassall 1983)

B = Brecon (Wheeler 1926)

C = Corbridge (Casey 1988)

Notes to TABLE 13

- (1) Not shown (above): one coin of Domitian from Site 60, one unstratified coin of Antoninus Pius from outside the excavated areas, and four unattributed coins from Sites 55 (2), 69 & 53.
- (2) Figures in parentheses indicate numbers of coins of pre-Flavian date whose loss is not inconsistent with the supposed earliest period of fortification at Loughor.
- (3) At Brecon coins of Flavian-Trajanic date which cannot be assigned to a particular period with any certainty have been omitted.

Catalogue⁴

	Issuer	Denomination	Reference	Issue Date	
<i>Period O Republican</i>					
1.	53\3327 (732)	Anonymous	Denarius	Crawford 114/1	206–195 B.C.
2.	53\930 (332)	L. Licinius etc.	Denarius	Crawford 282/4	118 B.C.
3.	57\014 (029)	C Vibius C f Pansa	Denarius	Crawford 342/5b	90 B.C.
4.	55\322 (221)	L Titurius L f Sabinus	Denarius	Crawford 344/3	89 B.C.
5.	53\016 (020)	C Considius Paetus	Denarius	Crawford 465/3	46 B.C.
6.	57\413 (267)	Mark Antony	Denarius	Crawford 544/29	32–31 B.C.
<i>Period O Imperial 14–43</i>					
7.	53\071 (044)	Tiberius	As	<i>RIC</i> 81	22–23
<i>Period 1 Claudian 43–54</i>					
8.	55\036 (032)	Claudius/Agrippina	Denarius	<i>RIC</i> 81	50–54
<i>Period 2 Neronian 54–68</i>					
9.	69\056 (098)	'Claudius'	As	copy	'55–70'
10.	69\056 (099)	'Claudius'	As	copy	'55–70'
11.	53\313 (089)	Nero	Dupondius	<i>RIC</i> 522	64–67
<i>Period 3 Flavian I: 68–81</i>					
12.	55\020 (048)	Vespasian	Dupondius	indeterminate	69–79
13.	55\276 (195)	Vespasian	Dupondius	indeterminate	69–79
14.	55\309 (212)	Vespasian	Dupondius	indeterminate	69–79
15.	55\159 (196)	Vespasian	As	indeterminate	69–79
16.	69\223 (148)	Vespasian	As	indeterminate	69–79
17.	57\317 (233)	Vespasian	As	indeterminate	69–79
18.	53\016 (001)	Vespasian	As	indeterminate	69–79
19.	53\242 (076)	Vespasian	As	indeterminate	69–79
20.	57\183 (194)*	Vespasian	Sestertius	<i>RIC</i> 424	70–71
21.	53\016 (022)	Vespasian	Sestertius	<i>RIC</i> 443	71
22.	53\1048 (398)	Vespasian	Dupondius	<i>RIC</i> 479	71
23.	57\085 (156)	Vespasian	Dupondius	<i>RIC</i> 740	72
24.	53\313 (104)	Vespasian	Dupondius	<i>RIC</i> 740	72
25.	53\1180 (496)	Vespasian	Dupondius	<i>RIC</i> 740	72
26.	57\089 (116)	Vespasian	Dupondius	<i>RIC</i> 739	72–73
27.	57\192 (211)	Vespasian	As	<i>RIC</i> 747	72–73
28.	53\1181 (493)	Vespasian	As	<i>RIC</i> 747	72–73
29.	53\1028 (466)*	Vespasian	Dupondius	(not known)	73
30.	57\149 (183)	Vespasian	As	indeterminate	75
31.	57\425 (259)	Vespasian	As	<i>RIC</i> 746	76
32.	57\245 (229)	Domitian Caesar	As	<i>RIC</i> 729	77
33.	53\585 (219)	Vespasian	Dupondius	<i>RIC</i> 754a	77–78
34.	57\164 (189)	Titus Caesar	Dupondius	indeterminate	77–78
35.	53\3333 (733)	Domitian Caesar	As	<i>RIC</i> 791a	77–78
<i>Period 4 Flavian II: 81–96</i>					
36.	60\006 (007)*	Domitian	Denarius	(not known)	81–96
37.	53\602 (242)	Domitian	Dupondius	indeterminate	81–96
38.	57\051 (051)	Domitian	As	indeterminate	81–96
39.	69\017 (008)	'Domitian'	As	copy	'81–96'
40.	57\088 (091)	'Domitian'	As	copy; as <i>RIC</i> 335	'81–96'
41.	53\3167 (730)	Domitian	As	<i>RIC</i> 300	85
42.	57\064 (065)	Domitian	As	indeterminate	85–96
43.	57\197 (222)	Domitian	As	<i>RIC</i> 335	86
44.	53\578 (203)	Domitian	As	<i>RIC</i> 335	86
45.	57\085 (149)	Domitian	Dupondius	<i>RIC</i> 406	92–94
46.	57\085 (155)	Domitian	As	<i>RIC</i> 408	92–94

47. 57\365 (244)	Domitian	As	<i>RIC</i> 408	92–94
48. 57\005 (068)*	Domitian	Dupondius	(not known)	93

Period 5 Trajanic: 96–117

49. 53\223 (054)	Nerva	Sestertius	<i>RIC</i> 76	96
50. 53\486 (182)	Nerva	As	<i>RIC</i> 64	96
51. 53\796 (296)	Nerva	As	indeterminate	96–98
52. 53\3292 (731)	Nerva	As	<i>RIC</i> 77	97
53. 55\020 (055)	Trajan	Dupondius	indeterminate	c. 98
54. 57\051 (047)	Trajan	As	<i>RIC</i> 392	98–99
55. 69\304 (167)	Trajan	As	indeterminate	98–99
56. 69\039 (039)*	Trajan	Dupondius	(not known)	98–117
57. 69\056 (092)	Trajan	Dupondius	indeterminate	98–117
58. 57\011 (022)*	Trajan	Denarius	(not known)	103–111
59. 57\005 (003)	Trajan	Dupondius	<i>RIC</i> 502	103–111
60. 53\078 (025)	Trajan	Dupondius	<i>RIC</i> 538	103–111
61. 57\084 (134)*	Trajan	Dupondius	<i>RIC</i> 641	114–117
62. 53\229 (065)	Trajan	Dupondius	<i>RIC</i> 665	114–117

Period 6 Hadrianic: 117–138

63. 69\020 (019)*	Hadrian	Sestertius	(not known)	134–138
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Period 18 Gallic Empire/Aurelianic: 260–286

64. 57\088 (099)	Gallienus	Antoninianus	<i>RIC</i> 230	260–268
65. 57\014 (030)	Claudius II	Antoninianus	indeterminate	269–271
66. 57\088 (094)	‘Claudius II’	Antoninianus	copy	‘269–271’
67. 55\012 (016)	‘Gallic Empire’	Radiate	–	271–286
68. 57\006 (017)	‘Gallic Empire’	Radiate	–	271–286
69. 57\051 (045)	‘Gallic Empire’	Radiate	–	271–286
70. 57\435 (270)	‘Gallic Empire’	Radiate	–	271–286

Period 20 Carausian: 286–296

71. 57\088 (100)	Carausius	Antoninianus	indeterminate	287–293
72. 69\005 (021)	‘Carausius’	Antoninianus	copy	‘287–293’
73. 55\036 (036)	Diocletian (Carausius)	Antoninianus	near <i>RIC</i> 9	290
74. 57\117 (114)*	Carausius	Antoninianus	(not known)	291
75. 57\117 (120)*	Carausius	Antoninianus	(not known)	291

Unattributed Coins

76. 55\038 (044)	filed blank (sestertius)
77. 55\183 (163)	Dupondius\As
78. 69\003 (038)*	Denarius (no information available)
79. 53\347 (134)*	fragment

Post-Roman Coins

- 57\006 (010). AR cut halfpenny, John, Class 5a, 1205–c. 1218. R. RICAR(D) mm cross pommee.
 - 53\3083 (714). AE farthing, Charles II, 1674.
 - 53\3782 (697). Tin halfpenny (perh. counterfeit), William and Mary, 1689–92.
 - 53\3010 (713). AE halfpenny, George III, First Issue, 1772.
- A copper-alloy disc (55\001 (001)) may be a badly corroded bronze penny of the post-1860 period.

OBJECTS OF COPPER ALLOY AND SILVER (FIGS 91–102) By G. Lloyd-Morgan

Introduction

The finds from Loughor are of particular interest as, in the main, the bulk of identifiable and datable items are of first- to second-century date. This is well illustrated by the collection of fibulae, all of which belong to this period, with an interesting number of early forms of brooch – as for example the Augen fibula No. 10 which has been found in continental contexts as early as the Tiberian period, and into Claudian/Neronian times. The Aucissa fibula No. 25 also

belongs to the later part of this period, as do the La Tène/Nauheim derivatives which are represented by three examples, Nos 11, 20, and 23. The penannular brooch, Fowler Type D5, has been dated from the early to mid-period of the first century. The plate brooch with applied trisceles plaque is also noteworthy, as it is paralleled by three closely related examples from Caerleon found within and without the *castra*. It is also interesting to note the fragment of bow brooch with serrate edges, related to the so called 'sawfish' type, which can be paralleled by a similar piece from Neath (Lloyd-Morgan 1992b, no. 1).

Bracelets tend to be more popular during the later part of the Roman occupation of Britain, though examples have been found in earlier contexts. One of the simplest types made of strands of wire twisted together is represented by the fragmentary No. 27. Another simple penannular type with flat expanded terminals and incised and punch-dot decoration can be compared with pieces from Brockworth, Glos.; and the small town of Alcester, Warwicks. The decoration appears to be related to the earlier forms of snake-headed bracelets, popular during the first and second century, imitating the pattern on the snake's head and neck areas and probably best identified as a viper.

Curiously enough there are only three finger-rings from the site, two of copper alloy, one of which was partially fused to an iron ring now in poor condition. Only one ring, No. 33, had a glass gem stone *in situ*. Of the two fused rings No. 34, the iron ring, appears to have had a paste or stone set in it at one time. Unfortunately the bezel of the associated copper-alloy ring is obscured by corrosion products, so no details of its shape or any setting can be distinguished.

Two 'dress fasteners' were identified, both from Site 55 (Nos 35 & 36), and like the fibulae they belong to the same overall period, the first to second century. Similarly the fragments of hand-mirrors are all first-century in date, or amongst residual finds of the earlier part of the second century.

Although no identifiable toilet instruments have survived, fragments of copper-alloy medical instruments have been found, including a probe and pieces of shaft from related implements, as well as the silver *ligula*, No. 44, for which no exact parallel has yet been located, though it is undoubtedly Roman in origin.

The domestic finds include a spoon with circular bowl typical of the first century, No. 52, as well as the piece with offset pear-shaped bowl typical of the second and third centuries. The best preserved vessel, No. 56, is virtually complete. This patera, den Boesterd's 'saucepan with bulging wall and flaring foot' is datable to the late first and second century, and can be compared with a related example with the stamp of the First Thracian cavalry unit, found at Caerleon and now in the Legionary Museum. Other vessels are represented by fragments or detached fittings.

The administrative side is represented by inkwells, No. 72 and the decorated top of another example No. 73, which lacks the hinged cover. Four fragmentary seal-boxes, two lids and two bases, were also identified as were parts of two balances. One, No. 78, is the arm of a crude beam balance, whilst No. 79 is the well-preserved end section of a steelyard arm with clearly marked divisions and numbered lengths.

Amongst the decorative studs are one silver example, now a little damaged, No. 84, and a smaller item, No. 83, which may have had an inlaid ring of enamel on the head. The concave-headed studs inlaid with a glass paste 'gem' are of a type found on a number of sites including Caerleon and Chester; Nos 81 and 94 are useful exemplars with No. 91 associated with a ring and sheet-metal loop fitting. Another stud is in the form of a narrow female bust shown full face (No. 87). Finally two studs are of well-known military type – No. 86 with punched decoration on the flat head and No. 92 with a stamped design showing the head of an emperor in right profile, a type belonging to a series dated to the second half of the first century and used to ornament the military apron.

Several keys, a lock bolt, and a fragment of what was probably a key-hole plate have also been noted.

Although there are some four dozen items of military equipment and fittings in various stages of preservation, there are some of considerable interest. Amongst these are fragments of scabbard binding of probably late first-century date, though it is not clear whether they were from a dagger, or more probably a sword scabbard. The most important piece, however, and possibly

the most significant find from Loughor, is the badly damaged openwork plaque from a sword scabbard with two decorative figured panels one above the other, No. 113. The upper panel shows a *vexillum* and part of the garment of an adjacent figure. The lower one again has a *vexillum*, with a Victory advancing holding a palm, and perhaps, in the missing section, a wreath for the victorious warrior. The piece can be closely paralleled by two better-preserved sword scabbards from the Netherlands, one of which has a panel which has been taken to refer to the Jewish Wars in the time of Vespasian. It seems likely that the Loughor piece came from the same workshop, making this, perhaps, the first example of this type to be recorded from Britain.

Other fittings include the buckles, strap fittings, and attachments from *loricae segmentatae*, whilst damaged scales, some still joined together with wire loops, attest the use of *lorica squamata* during the early occupation of the site. A poorly-preserved ear-guard from a later first-century helmet, No. 118, and beaded wire for the ornamentation of second- to third-century style helmets, as well as several finials, one of which, No. 145, was probably used to fix one end of the brow-guard to the helmet bowl, and another, No. 148, may have originally been intended for the top of the helmet, but was rejected as a flawed casting, demonstrate the range and variety of the surviving helmet fittings.

Amongst the belt fittings are six closely related pieces which may have been part of a single set. Four of these consist of a narrow half-cylinder with ribbed decoration and a small spherical knob at each end. Of the other two, one (No. 126) ends with a crescent-shaped terminal, the other has a hinge fitting along one side to take a pendant or other attachment, No. 128. They are probably mid-second-century in date. Another plaque, originally of rectangular shape, is inlaid with small triangles of blue enamel in four rows, and would have been attached to an ornamental buckle. It may be dated to the first half of the second century.

Cavalry fittings are also well represented. The silvered and incised pendant, No. 140, is typical of first-century horse furniture. There are two broken loops from harness junction-strap units; and another fragment with two integral rivets for attachment to a leather strap. The disc terminal of a silver harness clip, No. 135, suggests something of the pride with which the cavalryman dressed his horse, though this piece may have been part of a set for ceremonial rather than everyday use. There is also an interesting range of small leaf-shaped pendants, for which dates in the later first and second century would seem most appropriate. It is also interesting to note the buckle plate with rocked engraved decoration, No. 149, which is closely related to a number of finds from Britain and elsewhere which have been dated to the second half of the fourth century.

One of the smaller bells which have been found may well have been used to ornament, if not a cavalry horse, then the horses of other beasts used to pull transport wagons, or the *carpentum* and litters used by wives and family members.

Objects of sheet metal, wire, and other waste material such as slag are not uncommon finds on military sites where running repairs would use up some scrap when small fittings needed replacing. The slag would be a natural waste product when a mixed collection of scrap needed to be refined, or the purity of metal ingots needed to be checked.

Archive

The site archive consists of 565 entries of which 187 are repeated here.

Catalogue

Objects of personal adornment and dress

Brooches

Fragments of 34 brooches were recovered of which 26 are reported here. The omitted items are fragmentary brooch pins and springs.

1. 55\036 (024). Length *c.* 15 mm. Colchester derivative, being the upper section only with one wing surviving. The chord passes through the lug at the top of the head. One part of the spring with five turns survives, as does the axis. The bow is undecorated.

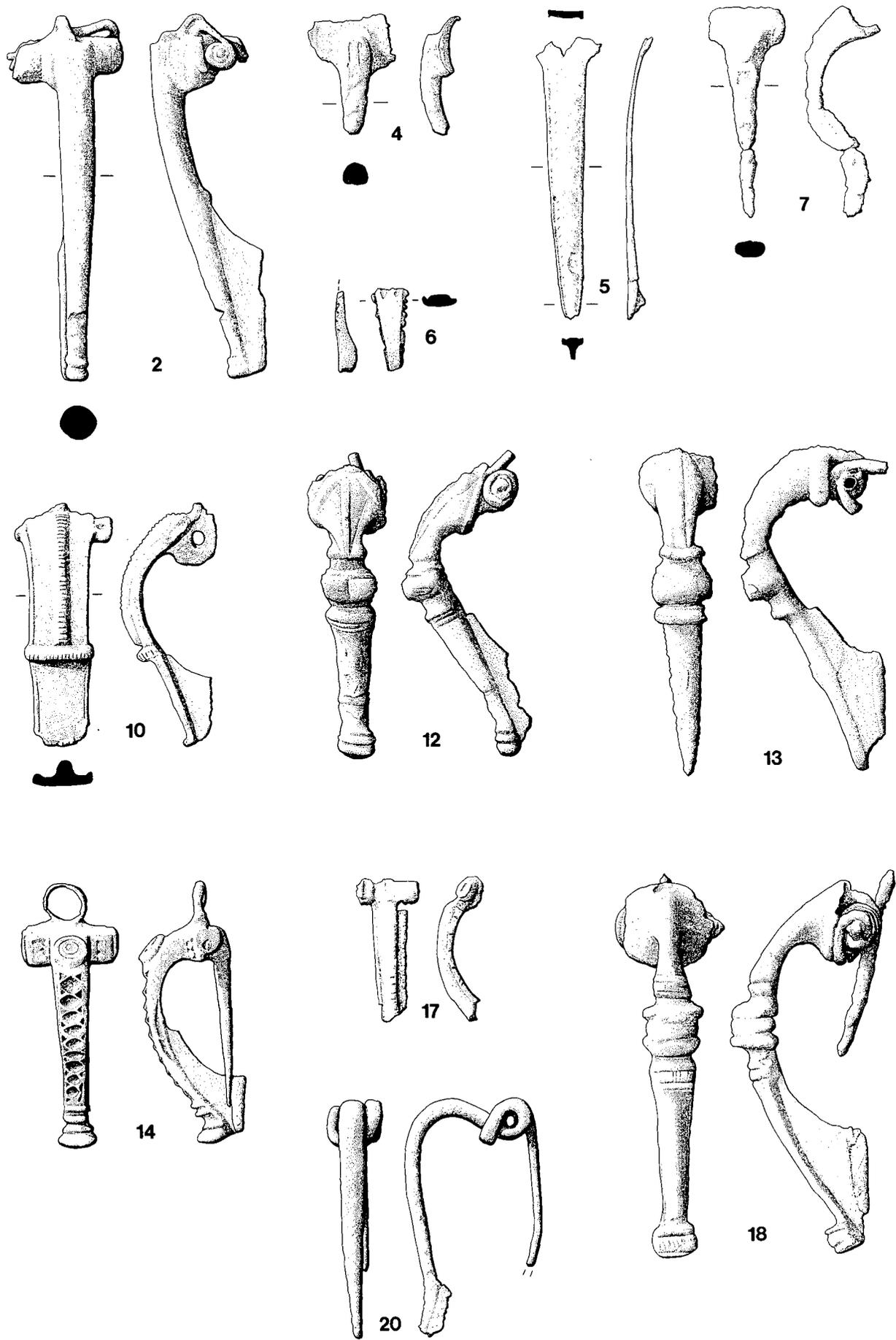


FIG. 91. Objects of copper alloy and silver. Nos 2, 4, 5, 6, 7, 10, 12-14, 17, 18, 20 (1:1).

Compare the piece from Cirencester, described as 'probably first century' (McWhirr, Viner & Wells 1982, microfiche frame A13 no. 1, fig. 52 no. 1) and the piece from Baldock, Herts., found in a third-century context (Stead & Rigby 1986, 112, fig. 43 no. 68). (Not illustrated).

2. 55\179 (181). Length 62.6 mm. Fibula, probably a Colchester derivative, with a straight bow of tapering circular cross-section. The complete chord passes through an upright pierced lug. The axis is still *in situ*, the pin is broken and mostly lost. One wing is damaged – the surviving one only covers part of the spring. A rounded moulding on either side of the head can be compared with those found on the Polden Hill fibulae.

The piece is comparable to the more angular and elaborately decorated example found during excavations in the Arthur John Car Park at Cowbridge (Lloyd-Morgan forthcoming, 41\001 (038)).

3. 55\140 (113). Length *c.* 13.3 mm. Fibula fragment, probably a first-century type (?Colchester derivative) consisting of the eroded upper part of the bow only, with some traces of tinning\silvering on the head. A further tiny fragment and a short length of the pin also survive. (Not illustrated).
4. 55\159 (190). Length 20.4 mm. Langton Down fibula consisting of the damaged upper part of the head, with most of the spring cover lost. There is some light linear engraved detail on the head and along the bow where the surface still exists. The spring and pin survive in part but are badly damaged.

The type is described by Hattatt as dating from the second into the third quarter of the first century (1982, 80–1, fig. 29 no. 39); note also the example from Woodcock Hall, Norfolk, which is dated 20–50 (Brown 1986, 21, fig. 12 no. 40).

5. 55\064 (060). Length 48.1 mm. Langton Down derivative, being a strip-like piece with grooves down the sides to mark the edges, with inside each one a line of tiny punch dots for further decoration. There are traces of tinningsilvering. The hinged pin, much of the head and most of the foot with catch are missing.

Compare the pieces from Hod Hill (Brailsford 1962, 8, fig. 7 nos C33–C38) and Maryport, Cumbria, where a first-century date is suggested (Webster 1986, 49 & 51, fig. 1 no. 1).

6. 55\020 (020). Length 14.3 mm. Lower part of the bow-section of a T-shaped brooch with serrate edge, probably a sawfish type or closely related version. It probably had a cell of inlaid enamel in the mid- to upper part of the bow, of which part survives in our fragment.

See the comparable complete examples dated by Hattatt to the early third quarter of the first century to mid-second century (1985, 96, fig. 41 no. 410 from Suffolk; 1987, 117, fig. 30 nos 933–5); and another from Woodeaton, Oxfordshire (Kirk 1949, 11, no. 17, fig. 2 no. 5, length 46 mm); and the related piece from Dwr-y-Felin School, Neath (Lloyd-Morgan 1992b, no. 1).

7. 55\012 (011). Length *c.* 36 mm. ?Head-stud brooch, much damaged, with a heavily eroded surface and traces of three or four square cells inlaid with traces of enamel, now a red colour. Part of the pin and three or four turns of the spring survive. The catch and foot of the bow are lost, and the lower part of the bow is bent out of true. The small wings on either side of the head were probably vertically grooved. Compare the piece from Meols, Cheshire, formerly in the H. Eckroyd Smith collection (Hume 1863, 71, pl. III no. 4). The type is dated by Hattatt to early to mid-second century (1982, 76, fig. 27a no. 33).
8. 55\064 (059). Diam. was *c.* 48 mm, cross-section hoop 1.8 mm, length pin *c.* 12.5 mm. Fragment of a penannular brooch, consisting of part of the hoop with one terminal knob in the shape of two disc-shaped beads, the larger, outer, one being lightly hatched around the edge. Part of the pin survives.

Probably Fowler Type A4 (1960, 152, fig. 1 type A4 with date-range from the first to third century, cf. p. 175). Compare the example from Cirencester (Wacher & McWhirr 1982, 92, fig. 25 no. 17) and the piece from Hopyard Meadow, Cowbridge (Lloyd-Morgan forthcoming, Site 43 IFR 013).

9. 55\170 (137). Diam. hoop *c.* 32 mm, cross-section hoop *c.* 2.6 mm. Complete and

well-preserved penannular brooch, Fowler Type D5 with semi-zoomorphic heads as terminals, crisply modelled. The pin was made from rolled sheet metal.

Compare the examples from Hod Hill (Brailsford 1962, 12–13, fig. 11 no. E 17); and from Bagendon, which is dated Tiberian to early Claudian (Clifford 1961, 184, no. 63, fig. 36 no. 8).

10. 69\226 (162). Length 42.3 mm. Augenfibel, or eyebrooch, with damaged head section, foot, and catch-plate. The spring and pin are lost. The central rib down the upper half of the bow, the raised flange across the mid-section of the bow and the surviving edge of the foot are all hatched.

The type is well-known on the continent, as for example, in the Roman cemetery at Keckwiese, Kempton, Germany (Mackensen 1978, 271, taf. 19 no. 1, Grave 64 no. 2, mid-late Tiberian; p. 224 taf. 30 no. 4, Grave 89 no. 1, Claudian; p. 229, taf. 38 no. 2, 3, Grave 108 no. 1, 2, Claudian; p. 256 taf. 82 no. 1, Grave 204 no. 1, Claudian; p. 282 taf. 119 no. 9, Grave 295 no. 2, Neronian date). Examples from Britain include five from Colchester (Hawkes & Hull 1947, 320–1, pl. xcvi nos 120–4 with a suggested Claudian date) and one from Woodcock Hall, Norfolk (Brown 1986, 20, fig. 11 no. 29) where a date span from the Conquest to *c.* the eighties/nineties is suggested.

11. 69\020 (014). Length *c.* 34.5 mm. Nauheim derivative, bow of the fibula and part of the catch-plate only. The spring, pin, and lower part of the foot are lost.

Compare Nos 20 and 23 below with bibliography. (Not illustrated)

12. 69\056 (093). Length 49.6 mm. Trumpet brooch of Collingwood Type R(ii)?, with moulded details on head and knobbed acanthus-type decoration on the central knob of the bow. The moulding continues in simplified form around the back of the bow. Much of the surface is damaged. The chord of the spring plus much of the pin and catch-plate are now lost.

Compare the fibula excavated at Sea Mills, Bristol in 1972 dated to between 64\70 and the mid-second century (Bennet 1985, 29, fig. 15 no. 3); also Nos 18 and 26 below.

13. 69\259 (169). Length 57 mm. Trumpet brooch, Collingwood Type R(iv) with some moulded detail on the upper part of the bow. The central knob has some moulded decoration but is virtually flat on the back. The surface is rather damaged and eroded obscuring some of the details. The spring is damaged, and the foot is lost as is much of the pin.

Compare the related and better-preserved example from Brockworth, Glos., which is dated from *c.* 75 into the second century (Rawes 1981, 65–6, fig. 8 no. 2).

14. 69\020 (081). Length 44.7 mm. Head-stud brooch with panels of lattice-shaped cells inlaid with enamel on the wings, and in a longer continuous panel down the bow. The hinged pin is intact, the head loop is worn but otherwise the piece is in excellent condition.

Compare the example from the Walbrook identical to ours (Guildhall Museum n.d., 4, no. 10, pl. 1 acc. no. 19,925); and a similar piece from Nor'nour which has no enamelling on the wings, and is dated to *c.* the second century (Dudley 1968, 42, fig. 16 nos 104 & 105, Hull's 'Lamberton Moor' type); and a related piece from Chichester where a date of late first into second century is given (Down 1978, 279–80, fig. 10.26 no. 11).

15. 69\210 (143). Height 77 mm, diam. central boss *c.* 18 mm, diam. brooch *c.* 25 mm. Umbonate disc brooch which probably had eight disc-shaped lugs around the circumference. The central boss is inlaid at the centre with ten triangular cells of enamel, now with a red appearance; with twelve triangular cells in an outer ring, which appear to be of blue enamel. There are traces of tinning on the flat outer flange, which is now badly damaged. The hinged pin is lost.

An example from Corbridge has a suggested date of late second century (Bishop & Dore 1988, 163, fig. 77 no. 20); another from Winterton, Lincs., was found in a fourth-century context and had blue enamel in the outer ring of cells (Stead 1976, 201, no. 32 fig. 101); a third piece from Nor'nour, Scilly, had red and blue panels of enamel alternating within each ring (Dudley 1968, 56, no. 206, fig. 22); and note also the example from London, now in the British Museum (inv. no. 52.3–22.1; Brailsford 1951, 20, fig. 11 no. 37).

16. 69\257 (180). Height 6.3 mm, width 13 mm. Worn and fragmentary head of a fibula, perhaps a Polden Hill type, with the remains of the chord passing through the lug at the top of the head, fragments of axis and spring, and remains of a flange at the end of each wing for holding the axis. (Not illustrated)

17. 57\247 (239). Length 24.7 mm. Fibula, probably a Hod Hill type, with the pin and lower section of the bow now lost. The central rib of the bow is hatched, with lighter hatching down the outer edges.

Compare the piece from Hod Hill (Brailsford 1962, 8, fig. 8 no. C46); and another from Woodcock Hall, Norfolk, dated *c.* 40–70 (Brown 1986, 26, fig. 17 no. 94).

18. 57\138 (162). Length 67.5 mm. Trumpet brooch, Collingwood Type R(ii) with stylised acanthus leaves about a central knob on the bow; the mouldings run around the whole circuit of the bow. On either side of the central moulding are lesser knobs with vertical hatching, echoed by an identical knob as the foot. Most of the head-loop is lost, as is the lower part of the pin. There are *c.* six turns surviving to the spring. Compare an identical piece from Malton, Yorks. (Mitchelson 1964, 253, fig. 18 no. 15); and a closely related example from Watercrock, Cumbria, from a construction trench dated late first to mid-second century (Potter 1979, 210, no. 12 fig. 84).

19. 57\183 (201). Diam. 24.6 by 27.7 mm, cross-section of hoop *c.* 2.3 mm. Penannular brooch, poorly preserved and heavily corroded, with folded back terminals with stylised heads, probably a Fowler Type D4. The pin is lost.

Compare the piece from Hod Hill (Brailsford 1962, 12, fig. 11 no. E16). (Not illustrated)

20. 53\2035 (579). Length 41.6mm. La Tène, Nauheim derivative, incomplete, the tip of the pin being lost, as is part of the catch and lower part of the foot; some surface damage.

Compare the example from Wroxeter from a level with the suggested date in the last quarter of the first century (Bushe-Fox 1916, 22, pl. xv no. 1); and others from Richborough, where some twelve examples are said to have been found (Cunliffe 1968, 78, pl. xxvi nos 5–7). Hattatt suggests a date of mid-first to the third quarter of the first century for the type (1982, 52–9, fig. 17 and especially 58, no. 9).

21. 53\2549 (636). Length 41 mm. Hod Hill type, the pin broken off and now in two pieces, otherwise complete.

Compare the example from Wroxeter from a context dated *c.* 80–120 (Bushe-Fox 1916, 22–3, pl. xv no. 3); and a similar piece from Colchester now in the British Museum (inv. no. 70.4–2.38; Brailsford 1951, 16, fig. 8 no. 11).

22. 53\2874 (798). Length 39.5 mm. Lower part of a bow brooch with small catch-plate. The outer face of the bow is decorated with an incised feather pattern. Probably a first-century type such as a Colchester derivative.

Compare two examples from the King Harry Lane site, Verulamium, with rocked decoration down the middle and lower part of the bow (Stead & Rigby 1989, 17, fig. 10 nos 17 & 18); and note the incised feather decoration on a Dolphin brooch from Braughing, Herts. (Potter & Trow 1988, 46, fig. 19 no. 45).

23. 53\1843 (520). Length 30.4 mm. La Tène III, Nauheim derivative fibula, poorly preserved, with the pin, part of the spring, and lower part of the foot lost (*cf.* no. 20). (Not illustrated)

24. 53\787 (299). Length 61.2 mm. Hod Hill fibula, a little bent with some surface loss. The upper part of the bow is badly damaged by ?corrosion, and the pin is lost.

Compare the piece from Verulamium from a context dated 80–100, and a second more elaborate but unstratified item (Frere 1984, 27, fig. 7 nos 36 & 37 respectively); and another from Wroxeter with a suggested pre-Flavian or Flavian date (Atkinson 1942, 201, no. H 11, fig. 36). (Not illustrated)

25. 53\1175 (467). Length *c.* 27 mm. Aucissa brooch, with two rows of fine ovolos on the narrow panel between the bow and hinge section. The surface is very eroded, the bow is in two pieces and lacks the foot and catch-plate, the pin has been broken off and the tip is lost.

Compare the example from Hod Hill dated Claudian/Neronian (Brailsford 1962, 8, fig.

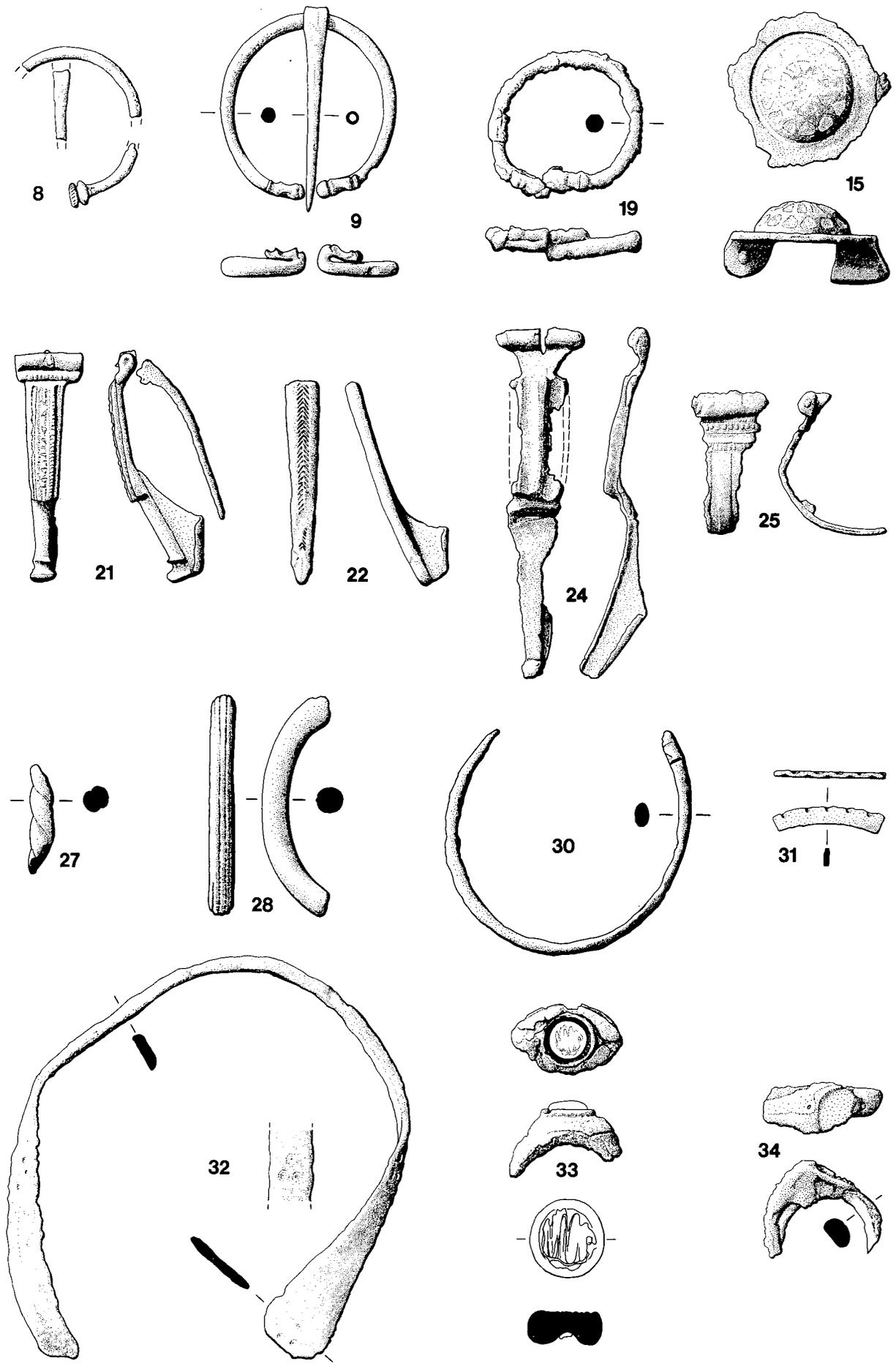


FIG. 92. Objects of copper alloy and silver. Nos 8, 9, 15, 19, 21, 22, 24, 25, 27, 28, 30-34 (1:1; detail of stone on No. 33 2:1).

8, no. C48); and another similar piece from Camerton found in a context dated 90–200 (Wedlake 1958, 226, fig. 55 no. 28A).

26. 53\786 (518). Length *c.* 18 mm. Trumpet brooch, Collingwood Type R(iii) or 'Chester' type, consisting of the head section only with the spring and upper part of the pin. There are some traces of tinning on the bow.

Compare the pieces from Whitton, Glamorgan, the first of which was dated late Neronian to early Flavian (Jarrett & Wrathmell 1981, 174, fig. 70 no. 22; 175, fig. 70 no. 24); and others noted by Hattatt (1985, 109–110, fig. 45 nos 435–7). Compare also the complete, unpublished piece from Alcester, Warwick. (SFNo ASH 1982 (1)). (Not illustrated)

Bracelets

Fragments of seven bracelets were recovered of which six are published here.

27. 55\036 (039). Length 18.9 mm, cross-section *c.* 4 mm; length 12.2 mm, cross-section *c.* 4.1–4.5 mm; length 11.5 mm, cross-section 3.8–4.1 mm; length 6.9 mm. Four fragments of a bracelet made of two heavy wires twisted together.

Compare the examples from Winterton, Lincs. (Stead 1976, 202, fig. 104 no. 46); Gestingthorpe, Essex, where examples are noted as dating from 'late Antonine times and through the third century' (Draper 1985, 29, fig. 9 no. 25); and the Lankhills cemetery, Winchester (Clarke 1979, Type A1b, discussed 302; no. 556 fig. 94 from Grave 369 dated 370–410). Compare also the piece from Bear Field, Cowbridge (Lloyd-Morgan forthcoming, 67\828 (157)).

28. 55\063 (054). Diam. *c.* 24.5 mm, length 46.5 mm, cross-section 4.2 by 4.6 mm. Fragment of a penannular bracelet with circular cross-section, and the outer face decorated with a lightly moulded series of raised ridges with two rows of beading between.

Compare the fragment with moulded terminal and similar decoration on the outer face as ours, from the Roman Town House at Glyde Path Road, Dorchester, Dorset, thought to have been occupied mid- or later fourth century to late fourth or early fifth century (Draper & Chaplin 1982, 109, fig. 50 no. 4).

29. 55\063 (058). Diam. *c.* 40 mm, length 37 mm, cross-section 5 by 5.5 mm. Curved bar or fragment of ?bracelet with ovoid or circular cross-section; the surface is eroded and a little encrusted. (Not illustrated)

30. 55\140 (115). Three fragments, length of hoop 43 mm, diam. 50 mm; length of hoop 45 mm, diam. 45 mm; length of hoop 29 mm, diam. 55 mm; cross-section of hoop *c.* 3.8 by 2 mm. Part of a bracelet with oval cross-section, the smallest slightly swelling towards a ?terminal and with light decorative incisions on the side and reverse. Much of the surface has been lost on all the fragments.

31. 69\003 (059). Diam. *c.* 60 mm, length *c.* 20.7 mm, cross-section 0.9 by 3.1 mm. Fragment of bracelet with rectangular cross-section, the narrow outer edge nicked on alternate sides to give a zigzag effect.

Compare the examples from Winterton, Lincs., dated third or fourth century (Stead 1976, 202, fig. 103 no. 43); from Gestingthorpe, Essex (Draper 1985, 29, fig. 10 no. 37); and Lankhills cemetery, Winchester (Clarke 1979, 306, no. 141, fig. 37, 75, Grave 117, dated 350–370; 306, no. 196, fig. 78, Grave 155, dated 310–350/370).

32. 53\656 (261). In two adjoining pieces, overall length 192 mm, thickness *c.* 1.5 mm, max. width at terminals 13.3 mm; 12.4 mm. Penannular bracelet with flat expanded, roughly triangular-shaped terminals, now worn but with traces of linear incised decoration in geometric, triangular patterns with applied dot-and-circle punch marks, in stylised imitation of the bracelets with snake-head terminals.

Compare the near identical design on an unpublished and unstratified piece from Birch Abbey, Alcester 1964–66 (SFNo ALC 64 (20) CA (43)); and a closely related piece from L. P. Wenham's excavations at Malton, Yorkshire 1968–9 labelled 'MOC'. A much simpler

version of the bracelet with incised lines only was reported from Brockworth, Glos. (Rawes 1981, 66, fig. 8, no. 8).

Rings

Fragments of 21 rings were recovered; two are described here.

33. 69\150 (119). Height of ring bezel 12.1 mm, width 5.8 mm, diam. of glass 'gem' 7.6 mm, height 3.1 mm. Bezel and shoulders only of a finger-ring, rather decayed with most of the hoop now lost. The shoulders have an angular cross-section. The raised circular setting is intact and a transparent, pale green circular 'gemstone', the upper side of which has stylised markings impressed into it, is still associated with it.

The slight ornamental flange along the edge of the hoop can be compared with that on the gold ring with oval engraved gem in the Wincle, Cheshire, hoard, dated to the third century (Johns, Thompson & Wagstaff, 1980, 52, no. 5, fig. 4a, pl. II a).

34. 57\164 (190). Two finger-rings fused together and now fragmented.

(i). Interior diam. ring *c.* 19 mm, recess for stone 12.6 by 10.5 mm. Iron ring, poorly preserved but the hoop probably had a circular cross-section, now in six fragments. The fragmentary bezel appears to have had an oval flat-bottomed recess for a glass paste or semi-precious oval gem stone to be inlaid.

Compare the rings Henig Type II and III of the later first to early second century (1974, vol. 1, 47, fig. 1).

(ii). Internal diam. of ring *c.* 17 mm, max. height 5.6 mm. The copper-alloy ring is in five pieces, three of which have an oval cross-section; two adjoining pieces have a roughly circular cross-section. The hoop appears to widen out towards the bezel but details are obscured by the overlapping of the bezel of the iron ring and its associated products. Probably the same general date as the iron ring.

Dress fasteners

35. 55\300 (214). Diam. head 23.8 mm, overall length 39.5 mm. Fastener with solid circular head cast with three raised mouldings as a border and with a lightly moulded ring around the raised centre. The heavy triangular loop is cast in one piece with the head. The piece is slightly chipped and damaged in places.

The fastener, Wild's Class V (a) with 'heads with cast ornament' has a suggested date range of late first or second century (1970, 140, fig. 1). Two examples were noted during excavations in the amphitheatre at Chester. The first, from excavations in 1930, was found with late first-century pottery (Newstead & Droop 1932, 25, 27, pl. XI no. 3), the second was found in a post-medieval context during work in 1960 (Thompson 1976, 190, fig. 25 no. 6).

36. 55\452 (226). Width of head 19.8 mm, length head 23.4 mm, depth *c.* 6 mm, overall length 33.2 mm. Fastener with tear-drop-shaped head and (?) separately made triangular loop. The central boss on the head has the remains of a disc-shaped field of enamel inlay, of which the original colour is uncertain. The outer raised border rises up to a slight moulded ridge at the tip.

Wild in his discussion of these Class III 'Tear-drop or petal-headed' fasteners dates the type to around the second century (1970, 138; 140, fig. 1). Potter notes two examples, one from Ravenglass which came from a second-century context, and the other from the east *vicus* of the fort at Watercrock, found in a phase dated Antonine to early third century (1979, 71, fig. 26 no. 24, and 214, fig. 85 no. 29 respectively). Other examples have been reported from Wroxeter (Bushe-Fox 1914, 14, fig. 5 no. 15) and South Shields (Allason-Jones & Miket 1984, 186, no. 3.585 with fig. op.).

Pins

Seven examples were recovered, none of which merit detailed comment here.

Mirrors

Fragments of seven mirrors were recovered.

37. 69\020 (076). Dimensions 6.4 by 11.6 mm, thickness *c.* 0.9 mm. Fragment of a mirror, the one side being finished, the other unfinished and slightly pocked. There is some corrosion on both sides but no original edge has survived, thus classing the piece with other Group Za fragments. (Not illustrated)
38. 57\142 (166). Dimensions 17.2 by 18.8 mm, thickness 1.2 mm. Fragment of a mirror with one finished surface, the other slightly pocked and unfinished. One rather irregular edge has survived, which suggests that this was probably part of a rectangular mirror. (Not illustrated)
39. 57\413 (269). Present size 28.2 by 29.8 mm. Fragment of a mirror with on one side the remains of approximately five countersunk holes as a border decoration, lying just over and outside a band of finely-turned concentric circles. Only a small badly damaged section of the edge survives. The other side is badly decayed and no details of decoration can be seen.

The fragment belongs to the disc of a hand mirror (Group K) of the most common and easily recognised type (Lloyd-Morgan 1981, 49–56). The type appears to have originated in Italy, and a series of complete examples from the reserves of the Museo Archeologico Nazionale, Naples, including inv. nos 74920, 74923P, 74927, 115595, 133331, provide excellent parallels for the fragmentary pieces from Britain. The type has its *floruit* during the first century, not only with the examples found buried, by the eruption of Vesuvius, at Pompeii and Herculaneum, but also in well-dated burials from the North-Western provinces. One from a cremation grave found at Aachenarstrasse, Cologne in August 1902 was dated to the mid-first century or a little later (Hagen 1906, 390–1, taf. XXII.16, Grave 16, diam. mirror 11.0 cm, length with loop-shaped handle 17.0 cm, formerly in the Wallraf-Richartz Museum, Cologne). One small fragment (SFNo Usk 63 HCR 2 (5)) was found in a pit at Usk; given a preliminary dating of the second half of the first century, it was later given a narrower date span of *c.* 60–75. Other Welsh finds include one from the Riding School Field, Caerleon (SFNo 79\001 (216), excavated by Dr Edith Evans, and two adjoining fragments of another mirror disc found at Dwr-y-Felin School, Neath (Lloyd-Morgan 1992a, no. 1), with further examples turning up at sites, military and civilian, in the Marches – as for example a poorly preserved fragment from a Hadrianic deposit at Wroxeter (SFNo WB 90, 204 (5922)), excavated by Dr Graham Webster.

40. 57\027 (312). Fragment of a mirror, one side finished, the other a little corroded and pocked. There is no trace of any original edge, thus classing the piece as Group Za as Nos 42 and 43 below. (Not illustrated)
41. 53\820 (328). Three fragments of mirror, dimensions 14.4 by 9.7 mm, thickness *c.* 0.8 mm (corner fragment); dimensions 8 by 5.5 mm; dimensions 4.1 by 2.2 mm. The best preserved piece is the corner of a rectangular mirror, with the edges bevelled to the reflecting side. The other two fragments probably came from the same mirror but are less well-preserved. They all have the characteristic finished reflecting surface, and a slightly pocked and unfinished reverse.

Rectangular mirrors (Group A) are one of the three most common forms of mirror found throughout the Empire, mainly in first-century contexts, although some appear to have survived above ground as heirlooms well into the second century (Lloyd-Morgan 1981, 3–20; 1975, 107–8, 109, figs 1 & 2). A complete mirror of this type was found with the hoard of silver plate in the House of Menander at Pompeii (Maiuri 1932, 452). Rectangular mirrors have been found, often incomplete, during excavations in Britain. Recently two examples have been found associated with cremation burials which included caskets; one at Wavendon Gate, Milton Keynes 1988–90 (SFNo MK 145 1988 (9)) and one at Duckend Carpark, Stanstead, Essex (SFNo DCS 1988, Grave 250 (J)). Other examples are gradually being found and recognised during archaeological work in

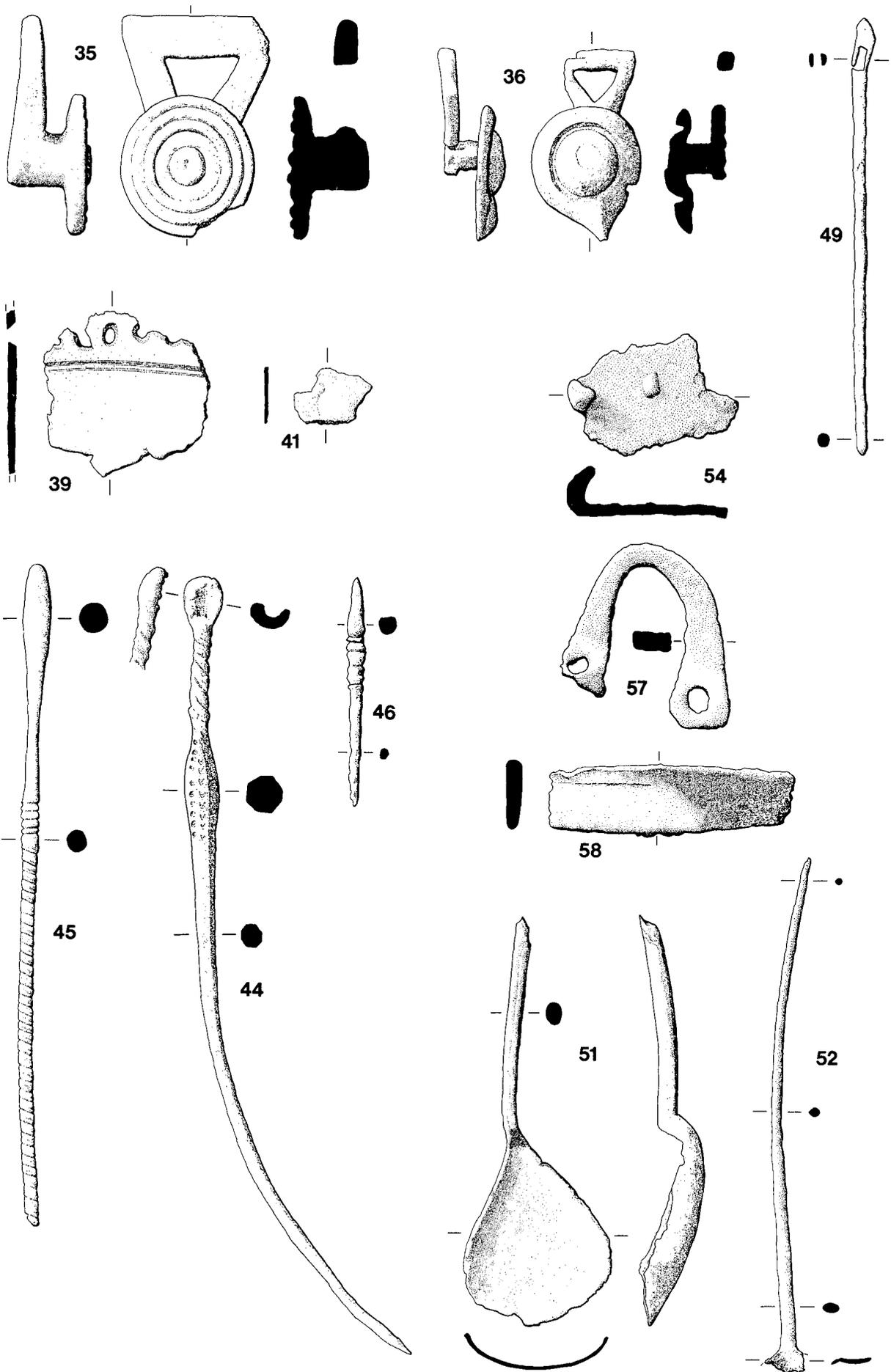


FIG. 93. Objects of copper alloy and silver. Nos 35, 36, 39, 41, 44-46, 49, 51, 52, 54, 57, 58 (1:1).

South Wales. One piece from Professor Manning's excavations at Usk (SFNo Usk 67 II 54 (19)) was said to come from a pre-Flavian context, whilst more recently a group of four fragments recovered from 'Roman Gates' Caerleon (Lloyd-Morgan 1992c, 161, no. 426a) came from a context dated to the end of the first century. Another corner of a rectangular mirror, now in the National Museum of Wales, Cardiff (inv. no. 09.182) came from John Ward's excavations at Gelligaer, though there is no reference to it in the published reports.

42. 53\313 (103). Dimensions 8.6 by 9.2 mm, thickness *c.* 1 mm. Fragment of a mirror; one side is a little decayed, the other retains some silvering or tinning on the unfinished, pocked, surface.

The unfinished surface suggests that the fragment came from either a simple rectangular or disc-shaped mirror. As no original edges have survived, the fragment is classed as Type Za, but can be roughly dated to the first century when both rectangular and disc mirrors were at the height of their popularity (Lloyd-Morgan 1981, 107–8). (Not illustrated)

43. 53\2241 (590). Dimensions 29.3 by 26.1 mm, thickness 1.3 mm. Fragment of a mirror as No. 42 above, with one finished reflecting side still retaining traces of tinning or silvering, and an unfinished, pocked, reverse. No original edges survive, so this piece is classed as Group Za. (Not illustrated)

Toilet and surgical instruments

Medical instruments

44. 57\385 (248). Length *c.* 149 mm. A silver medical or toilet implement of uncertain date, in four pieces and a little bent. The shaft tapers to a point at one end and has an octagonal cross-section; the other end has a tiny sub-spherical spoon or scoop with the handle linked to the widest part of the shaft by a twisted section. The widest portion of the shaft is decorated on alternate faces with lines of 'V-shaped' punches. By contextual association this piece should date to no later than the first half of the second century.
45. 57\371 (249). Present length 114.1 mm. Probe in two pieces; the incomplete shaft is turned with a double 'S' spiral, the other end, probably a spatula, has been lost.

Compare the instrument with probe and oval spoon found in a doctor's cremation grave at Belginum\Wererath (Rheinland Pfalz) now in the Rheinischen Landesmuseum, Trier and dated late first/early second-century (Künzl 1983, 73, fig. 46 no. 4); and Richborough for another more complete example than ours where a date of early second-century or earlier is suggested (Cunliffe 1968, 100, pl. XLIII no. 172); with a further example from Lion Walk, Colchester dated *c.* 60\75–100\150 (Crummy 1983, 60, fig. 65 no. 1927).

46. 53\572 (212). Length of probe 18.2 mm, length of decorated shaft 39.6 mm, length of other shaft fragments 13 mm, 9.2 mm, 11.8 mm, 6.7 mm. Medical instrument in six fragments, one of which is a probe. Part of the shaft with five narrow decorative collars survives, the other four fragments of the shaft are undecorated.

Compare the complete probe*ligula* also with complex mouldings on the shaft from the Walbrook 1954–55 (Guildhall Museum, n.d., 12–13, pl. v no. 3).

47. 53, 310 (175). Length 67.3 mm, max. cross-section 3.9 mm. Shaft of a medical implement decorated with *c.* 13 turns of a double 'S' spiral along most of the shaft.

Compare the decoration on the shaft of No. 43 above. (Not illustrated)

Objects associated with the manufacture and working of textiles

Needles and sewing equipment

48. 53\856 (306). Length *c.* 60 mm. Needle, bent and badly worn. (Not illustrated)

49. 53\787 (308). Present length 75.2 mm. Needle or bodkin with neat rectangular eyelet, rather chipped and damaged.
50. 53\307 (085). Length 86.1 mm. Shaft of pin or other implement, probably a needle, in two adjoining fragments, incomplete. (Not illustrated)

Household utensils and furniture

Spoons

51. 69\005 (020). Present length 70.7 mm, length of handle fragments 26 mm, width of bowl 27.2 mm. Spoon with offset pear-shaped bowl with traces of silvering in the bowl. Incomplete and undecorated.

Strong notes that the *ligula* with pear-shaped bowl is found in the first century, but is also found in hoards of the second and third centuries (1966, 155, fig. 32b & c; 177, fig. 36b). Two examples were recorded from Dover, the first from a context dated 210–270, the other 190–210 (Philp 1981, 162, fig. 38 no. 180; 163, fig. 38 no. 184). Crummy notes a complete silver example from Balkerne Lane, Colchester from 'late period 5'–c. third century, and an incomplete piece, consisting of the bowl only, from an uncertain context in Lion Walk (1983, 69, fig. 73 nos 2014 & 2012 respectively). Another complete but unpublished silver spoon was found at Piddington Roman Villa, Northants. 1979 (SFNo 1, length 118 mm).

52. 53\012 (516). Present length 90.5 mm. Tapering handle of a spoon with slight remains of a plain circular bowl.

See Strong, where the type is dated to the first century (1966, 155, fig. 32a). Compare the damaged example from Skeleton Green, Herts., from a context dated mid-Augustan to early Tiberian = c. 10 B.C. to A.D. 20 (Partridge 1981, 107, fig. 55 no. 23). A more complete piece from Richborough was noted by Cunliffe who suggested a date from Claudian times onward for the type (1968, 101, pl. XLIV, no. 182). Another piece from Nettleton was said to have been found in a first- to second-century context (Wedlake 1982, 201, fig. 83 no. 1).

53. 53\183 (178). Length 15.4 mm, cross-section c. 3 by 2.5 mm. Rod with square cross-section and 'S' spiral twist. Probably the handle of a spoon, or the shaft of another implement type. (Not illustrated)

Vessels

54. 69\005 (024). Height 31 mm, width 22.4 mm. Fitting, possibly from a vessel but poorly preserved and with much of the original edge lost. The concave, reverse side is crudely finished.
55. 57\006 (011). Height 26.2 mm, width 21.5 mm, max. thickness 5.4 mm. Fragment of a vessel rim, rather crude, with traces of tinning/silvering.
56. 53\3980 (698). Diam. base 109.5 mm, diam. at mouth c. 171 mm, length of handle 135 mm, diam. terminal disc c. 80 mm, height of bowl c. 80 mm. Patera with bulging wall and flaring foot. The band of incised decoration below the lip appears to be a series of vertical incisions c. 3 mm apart and c. 9.5 mm high, described elsewhere as a palisade motif. The handle had the well-known disc-shaped terminal with a central hole and moulded edge, with an inner ring-shaped border decorated with punchmarks to suggest a guilloche or cord pattern. On the upper side of the handle just in from the disc terminal there is a band of nine small dot-and-circle punch marks, and beyond this in a triangular panel a series of dots, circles, and dot-and-double-circle punch decoration. There are no signs of any maker's stamp. Part of the wall of the vessel has been damaged, but most of the fragments have been preserved. The base with the characteristic heavily turned underside is intact.

Den Boesterd discussed this group, described as the 'so-called Gödäkertyp', as being made at Capua possibly in the late first century, though others were also made in Gaul from about the same time and continued in use throughout the second century. The

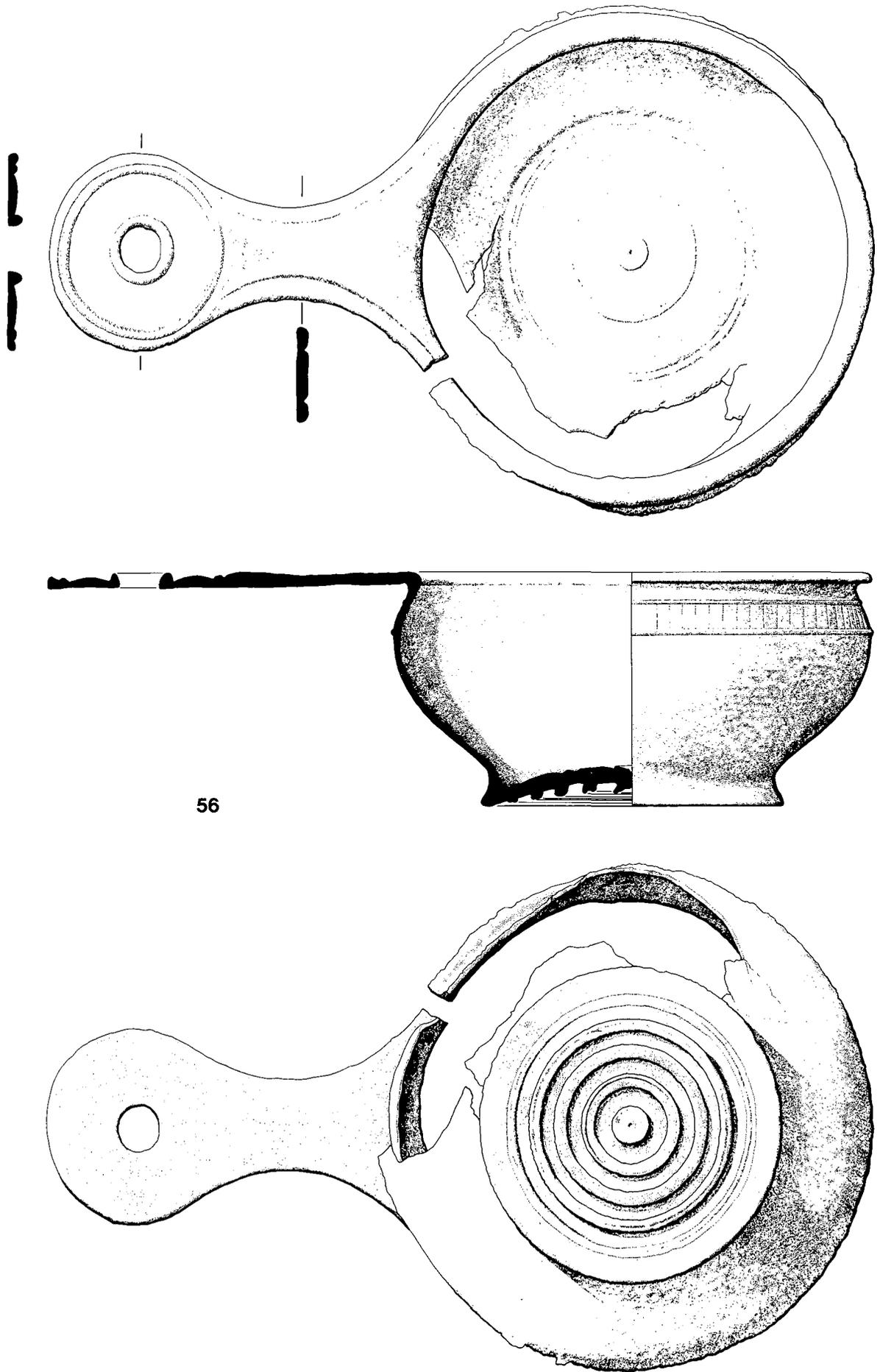


FIG. 94. Objects of copper alloy and silver. No. 56 (1:2).

palisade decoration seen on the Loughor find parallels the example in Nijmegen thought by den Boesterd to be of Capuan origin, though the punch decoration on the handle is related to that on two other paterae which she suggested were Gaulish in origin (1956, 10–11, pl. II no. 27; pl. II nos 28a, 29a shows the handle decoration of the Gaulish paterae). Tassinari illustrates a patera closely related to ours, with the identical band 'en palissade' and with small circular punch decoration on the handle, from 'Gissey-sur-Ouche au lieu dit Le Visignot (Côte-d'or)', with a votive inscription (1975, 31–2, no. 18 pl. v a, b, c, inv. no. 26 642, diam. 16.1 cm, height 8 cm). Another closely related example, but a little larger, came from Grave 1 at Zohor, district of Bratislava, in Slovakia (Kraskovská 1978, 12–13, item no. 1 on fig. 5.1, pl. VIII, 1, table on p. 37 item no. 17, cf. also p. 26–7 for brief discussion).

57. 53\2505 (626). Height 30 mm, max. width 32.2 mm. Crude loop-shaped handle with rivet-hole for attachment at either end.

The handle comes from a bucket of Östland type, as can be seen from a cremation burial at Ohništany (district of Hradec-Králové); and another from a cremation found at Třebusice (district Kladno) in a cemetery used from the first to third century (Sakár 1970, 36, fig. 21 no. 14; 49. fig. 19 no. 8 from Grave XXXIX/36 respectively). Den Boesterd dates the Östland bucket type to the first and second centuries, though some examples continued to be used into the third century. Two unpublished handles have been noted from Chester, from excavations at Linerhall Street 1863 (SFNo 19); and Abbey Green 1975–8 (SFNo 30).

58. 53\2354 (612b). Dimensions 47 by 11.4 mm, thickness 1.5–2.5 mm. Curved strip of uncertain function, found in association with No. 59 below. (Not illustrated)

Casket fittings

As might be expected, some of the best preserved examples of boxes and caskets come from funerary contexts where they have been included with other grave goods either as containers of small personal items, in the same way as they would have been used during the owner's life, or as containers for the ashes of the dead. In many cases the wood has decayed leaving the metal fixtures more or less in position. An interesting example of this is the chest from Godmanchester, Cambs., which was excavated under the direction of Mr H. J. M. Green for English Heritage (Rankov 1982, 363). This was extracted as a solid block and taken to the Ancient Monuments Laboratories where preliminary investigation revealed that there were two boxes, one inside the other, the outer one being more elaborately furnished with copper-alloy fittings. A similar method of investigation was used on another casket from Butt Road, Colchester (Crummy 1983, 85–8). Although not all caskets are so well recorded and preserved, as for example the boxes represented only by their mounts found in the area of the Railway Station and Hotel at York, the fittings were sufficient for reconstruction to be attempted (Eburacum 1962, 82, Region IV (c) vi; 84, Region IV (e) vi fig. 65). The lock-plate, either plain or with some decoration, appears in a number of cases to have been attached to the centre front of the box by iron nails, the heads of which were concealed by lighter, decorative copper-alloy studs. Not infrequently these are in the form of stylised lion heads, as found on caskets from the cemetery at Skeleton Green, Herts. (Partridge 1981, 304–21 and esp. 320–1, table XLVI), the Godmanchester outer box, and as stray finds from unpublished excavations including Chester (St Martins Field 1964–5, SFNo 46; Hunter Street School 1981, SFNo 1600); Piddington Roman Villa, Northants. (1981, SFNo 149); Birch Abbey, Alcester, Warks. (ALC 64, SFNo 206, CA 168). Two further examples with some fragments of other metal fittings were found recently in a burial at Wavendon Gate, Milton Keynes (MK 145, 1988, 4 SFNos 9 & 40). Remains of an iron backing-plate for the lock were found with the Wavendon Gate fragments, and can be paralleled by the plate found with the Butt Road, Colchester box. Binding to protect the vulnerable edges and corners of the box and its lid is not uncommon, and may in some cases be elaborately decorated, as for instance the fourth-century plaques from Tordas, Hungary showing four Muses; and another set from Gorsium with personifications of the four Seasons (Bánki 1972, 61–2, no. 42; 63, no. 43); and

from Agrippastrasse, Köln in 1982 (Menzel 1986, 190, no. 526 taf. 157–8 inv. no. 8736). Although some caskets retain their drop-handles, normally found on the shorter sides of the box, as on the reconstructed casket from Santon Downham, Cambs. (Liversidge 1955, 62, pls 66 & 67), or the farriers tool-box from the cattlemarket, Chichester where heavy rope handles have been postulated (Down 1982, fig. 5), other boxes have only a single handle on the front of the lid, centred just above the lock plate, as for example on the reconstructed late Roman box from Burgheim, Lkr. Neuberg a.d. Donau (Menzel 1969, 39, no. 72, taf. 18.1, inv. no. 1960, 624), and Cologne-Lindenthal (Noelke 1984, Grave 2, 390, abb. 7, 10, no. 55b, dated to the last part of the third century).

A more unusual form of handle has been found on a number of first-century boxes, and consists of a series of rings attached to the sides of the box by crude loops or split pins, and linked to one another by several swags of chains crossing each other to give an additional decorative appearance. One of the more recent examples that have been found was in one of the rich graves at Stansted airport, and it can be paralleled by a similar piece from Richborough, dated to the Claudian period (Bushe-Fox 1928, 30–31, pl. xx, fig. 1 from Pit 20), and the ten rings with fragments of chain still attached from a casket burial in the Gallo-Roman cemetery at Solre-sûr-Sambre, Belgium (Brulet 1972, 57–63, figs 36–40 Grave 32, cf. 62 no. 14 c-g for remains of the casket fittings). A date in the Flavian period was suggested by M. H. Thoen (1973, 308–9). The casket rings are easily identified as they have raised ridge decoration on the outer face. It has been claimed in the past that these rings were of military use, for attachment to scabbards or used in harness, but this has not been conclusively proven (*pace* Fox & Ravenhill 1972, 96, fig. 19, no. 14. The fort at Nanstallon was occupied during the Neronian to Vespasianic period, cf. 87–8 for discussion; also Sherlock & Woods 1988, 202, fig. 62, no. 3).

The presence of copper-alloy fittings from small boxes should not cause any particular surprise when found within either a civilian or military context. In a society where household furniture was minimal, even amongst the wealthy, lockable boxes to store clothes and personal items would have been important to the individual, especially the soldier living in the barracks and often on the move within the Empire. Loose fittings could drop off accidentally through careless handling, old broken boxes beyond repair would be discarded or broken up for kindling, leaving incomplete sets of nails, hinges, and plaques scattered about in a variety of contexts. Hence none of the Loughor drop-handles has a matching counterpart, and the ribbed casket rings have a variety of diameters between 22 and 29 mm. Some of the sheet-metal fragments and plaques have come from one or more caskets which were in use during the Roman occupation. Without a large quantity of identifiable fittings, any hope of reconstructing a box as used at Loughor would be extremely slender.

59. Box fittings 53\2354 (612).

(a) Plate 21 by 75 mm, thickness 0.9 mm; handle width 76 mm, depth 30 mm; split pin length 31.6 mm, estimated thickness of side of wooden box into which it was inserted *c.* 19.8 mm. Flat undecorated ansate plaque, pierced by two holes to take two split pins holding the drop-handle with knob terminals. The plaque is damaged and incomplete.

Compare the casket fittings from Wroxeter, from a context dated *c.* 160, which included an unusual ansate-shaped lock-plate (Atkinson 1942, 210, no. 10, pl. 48a).

(b) Width 71.6 mm, height *c.* 24.6 mm, cross-section grip 2.8 by 3.2 mm. Drop-handle, the grip with diamond-shaped cross-section, and simple knob terminals. The remains of two split pins for attachment are still *in situ*.

(c) Surviving length of one strap 53 mm, width 26 mm. Iron loop hinge, incomplete with part of one strap end and the remains of the second piece *in situ*. For discussion of the type cf. Manning (1985, 126 and fig. 31, no. 2 on 125).

(d) (i) Width 42.5 mm, height 46 mm; (ii) length 47 mm, height 23 mm, thickness *c.* 7.5 mm. Iron staple or joiners dog, corroded and in two adjoining pieces.

Compare the examples in Manning 1985, 131, pl. 61, no. R.52 and especially no. R.53.

(e) (i) Shaft of nail, length *c.* 69.5 mm; (ii) shaft of nail, length *c.* 38.5 mm; (iii) shaft of nail, incomplete length *c.* 34.5 mm; (iv) shaft of nail, incomplete length *c.* 20.7 mm; (v)

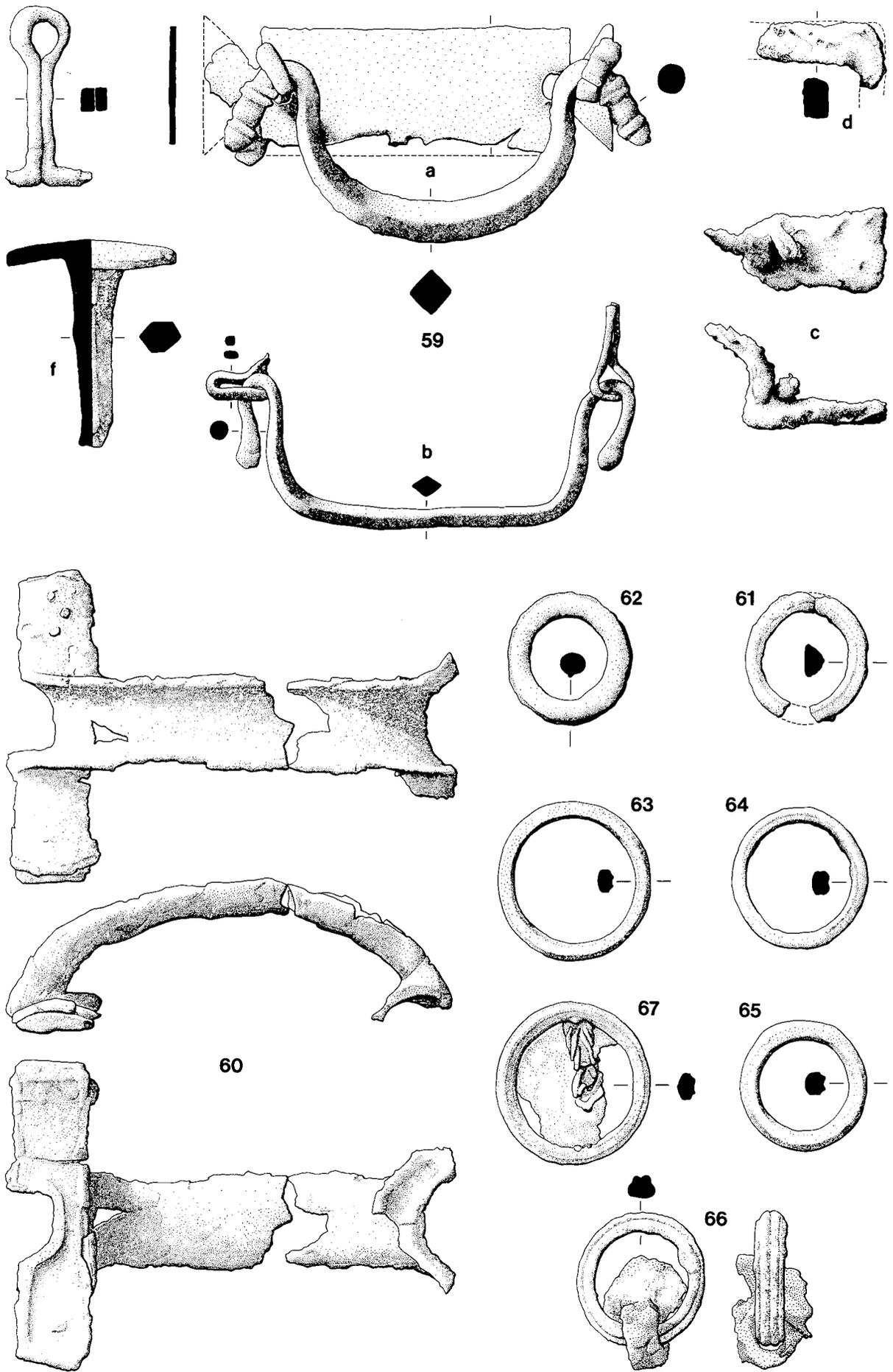


FIG. 95. Objects of copper alloy and silver. Nos 59a, 59b (1:1), 59c, 59d (1:2), 59f, 60-67 (1:1).

nail or fitting, length *c.* 62 mm; (vi) nail with head incomplete, length *c.* 41.8 mm; (vii) nail, length 47.4 mm; (viii) nail in three pieces with remains of wood still attached but heavily mineralised, and probably used at corner of the box as the wood grain clearly runs in two different directions, length *c.* 77 mm; (ix) bent nail, length *c.* 90 mm; (x) bent nail, length *c.* 70 mm; (xi) nail encrusted, length *c.* 58 mm; (xii) tip of nail encrusted, length *c.* 24 mm. Twelve iron nails and fittings from box, the nails usually with a square cross-section. Also three lumps of different size, two of which adjoin, probably connected with the inner fittings around the lock, or near the handle attachments. (Not illustrated) (f) Diam. of head 30.7 mm, height 35 mm. Large stud with slightly convex disc-shaped head, and roughly square cross-sectioned pin, the tip of which is now lost. Found in association with the box-fittings above; see also No. 58 above.

60. 57\409 (263). Bar *c.* 53.3 by 14 mm, depth 4.2 mm; handle section width *c.* 17 mm, depth 6.3 mm. Handle or fitting ?from a chest, being parts of two rectangular bars or attachments with convex outer face and slight moulding at each narrow end, and two nail-holes with remains of nails still *in situ*; originally connected by a curved strip with concave cross-section.
61. 57\050 (044). Diam. *c.* 22 mm, height *c.* 5.6 mm, width *c.* 3.7 mm. Ring with ribbed decoration on outer face as Nos 63 and 64 below. In two pieces, incomplete and with an eroded surface.
62. 57\164 (310). Diam. 22.6 mm, height 4.8 mm, width 4.2 mm. Ring with ribbed decoration on outer face as Nos 63 and 64 below.
63. 53\016 (021). Diam. 28.1 mm, depth 3.7 mm, width 3 mm. Ring with a ribbed outer face and D-shaped cross-section of hoop.

Compare the rings associated with the caskets in Burials 3 and 4 from Cemetery A at Skeleton Green, Herts. (Partridge 1981, 312–15, figs 118–20, with discussion and analysis of these caskets and other examples with similar fittings, which all seem to be datable to the late first and second centuries, cf. p. 316–21). To these can be added the rings from the casket in a rich burial, Grave 250, from Duckend Carpark, Stanstead, Essex in 1988. The rings there were of two sizes, the larger being of diam. *c.* 33 mm; the smaller ones of diam. *c.* 25.5–26 mm. All twelve rings had a ribbed outer face, as in the Skeleton Green examples and the finds from Loughor (Nos 68–71 and also 57\050 (044) & 57\164 (310) unpublished archive Nos 97 & 98 respectively). Compare also the fragment of a similar ring from the Legionary Baths at Caerleon (Zienkiewicz 1986, 175, fig. 56 no. 24).

64. 53\US (038). Diam. 24.6 mm, depth 3.4 mm, width 2.7 mm. Ring ribbed on outer face with D-shaped cross-section, a little encrusted and from a casket, as No. 63 above.
65. 53\1688 (513). Diam. 23.1 mm, depth 3.6 mm, width *c.* 3.6 mm. Ring ribbed on outer face, the surface a little damaged, as No. 63 above.
66. 53\2035 (571). Diam. 23.9 mm, depth 4.9 mm, width *c.* 3.5 mm; split ring width *c.* 6 mm, diam. of loop *c.* 10 mm. Ring with ribbed outer face, with iron split ring and fragmentary copper-alloy plate for attachment to a chest or casket.

Compare the rings with iron split rings from Burial 4 at Skeleton Green (Partridge 1981, 314–15, fig. 119 nos b-j; FIG. 120 nos k-n).

67. 53\2224 (570). Diam. ring 29 mm, depth 4.3 mm, width *c.* 3.2 mm. Ring with ribbed outer face and remains of double loop-in-loop chain still partially attached and draped diametrically across the hoop.

The use of swags of light copper-alloy chain as decoration, or for practical use when handles are not separately made and attached is seen in the casket from Richborough (Bushe-Fox 1928, 30–1, pl. xx, fig. 1 from Pit 20), and in the unpublished Duckend, Stanstead, casket noted above (see No. 63). The use of chains appears to have had a fairly long history in Central Italy, and especially in the Etruscan heartland. A number of elaborately decorated *cistae*, holding articles such as combs, oil bottle, strigil etc., have been found ornamented with such swags of chains (de Puma 1986, 100, 102 *cista* SB20, pl. 47, fig. 36 dated late fourth century B.C.; 102, 104 *cista* SB21, pl. 48, fig. 37 dated late fourth or early third century B.C.).

68. 53\3123 (804). Width 67.1 mm, height 32 mm. Drop-handle with angular cross-section and a fragment of each of the split pins still *in situ*. The surface is heavily eroded.
Compare the piece from Richborough originally described as a casket handle, though it should be noted that some handles, especially those found in a military context, could equally be either carrying handles for helmets, or handles for a small chest or casket (Cunliffe 1968, 101, pl. XLIV no. 186).
69. 53\656 (262). Length 64 mm. Wire tapering towards each end, ?part of a light drop-handle or an offcut? (Not illustrated)
70. 53\1139 (458). Length 33 mm, width 8.4 mm, overall height *c.* 20.5 mm. Small staple or clamp with flat, sub-rectangular head, and a tapering nail-shaft at either end, used in the construction of boxes and light furniture, now rather frail, undecorated.
Compare the related example from the fort at Watercrock found in a context dated to *c.* 270 (Potter 1979, 217, fig. 86 no. 69, for dating cf. 205).
71. 53\310 (140). Height 35.6 mm, max. width 14.5 mm. Hook-fitting attached by a rivet to a fragment of iron plate. Possibly a catch from a box or casket?

Objects employed in weighing and measuring

Weighing instruments

72. 57\339 (234). Length 175 mm. Damaged arm from a simple, rather crudely made ?beam balance, with broken loops for attaching the chains and pans at either end. The centre section is flattened to take the suspension loop fitting. Note that the distances between the end loops and centre hole are not equal.
73. 53\2353 (610). Present length 82.7 mm, max. cross-section 4.4 by 6 mm, diam. of terminal knob 8.5 mm. Fragment of steelyard arm with disc-shaped terminal knob, and ovoid cross-section. Each side is marked off in units, and the narrower sides notched to correspond with the appropriate numbers.
Compare the more complete example from Whitton (Jarrett & Wrathmell 1981, 182, fig. 72 no. 48); and another, complete example from the Walbrook, London, now in the British Museum (acc. no. 1935. 10–28.1; Brailsford 1951, 78, fig. 40 no. 11). Another piece from the Austin Friars, London, has the numerals and divisions marked in a similar way to ours (Wheeler 1964, 87, fig. 23 acc. no. A1272).

Objects associated with trade and communications

Ink wells

74. 53\1142 (476) and 53\1361 (503). Height *c.* 42 mm. Incomplete remains of a cylindrical inkwell with light double-moulded collars around the top and bottom edge and around the centre. Poorly preserved and rather distorted.
Compare the near complete example from Chichester (Down 1978, 296 fig. 10.33 no. 46); another from Carnuntum, Austria dated second/third-century and now in the Museum Carnuntinum, Bad Deutsch Altenburg inv. no. 15015 (Mutz 1972, 147, no. 420); a third is described as coming from 'Torre Annunziata' ex Temple colln. and illustrated in the *Pompeii AD 79* exhibition catalogue (Ward-Perkins & Claridge 1976, no. 285, British Museum, Dept. Greek & Roman Antiquities inv. no. WT682).
75. 53\1908 (533). Diam. 36.2 mm, depth 5.8 mm. Top of an inkwell with recessed central section and remains of the hinged section for the lid. The remains of punch-dot decoration (or inscription?) can be seen in part round the outer section, the rest is under corrosion products.
Compare the top with the hinged lid from the first-century fortress at Longthorpe (Frere & St Joseph 1974, 63, no. 85, fig. 33); another with decoration was found at the Walbrook in 1954–5 (Guildhall Museum, n.d., 14–15, no. 1, acc. no. 19,779); and another from

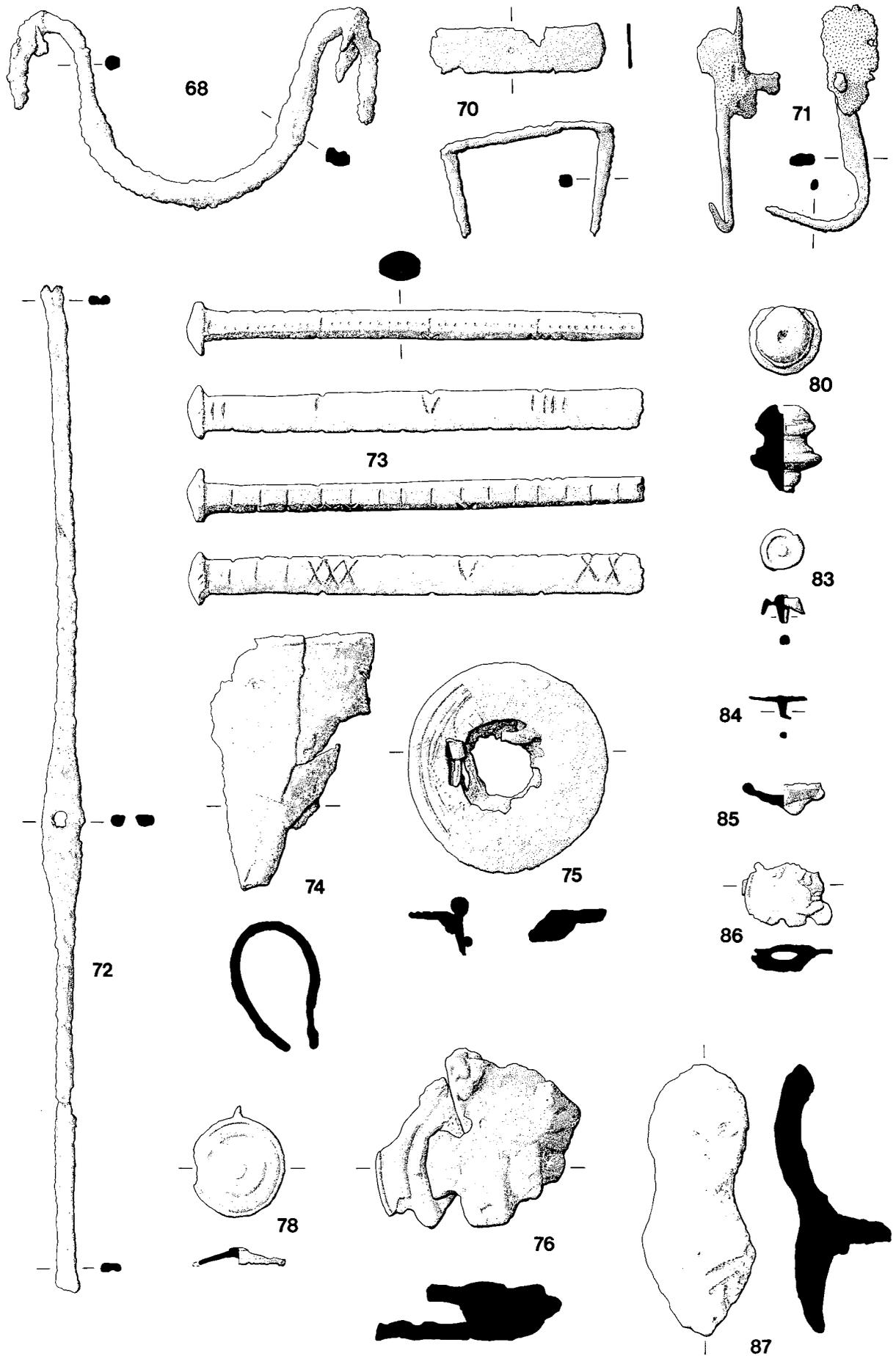


FIG. 96. Objects of copper alloy and silver. Nos 68, 70-76, 78, 80, 83-87 (1:1).

excavations at Doncaster has silver and niello inlay in a leafy scroll pattern (SFNo DT/SK (269)).

Seal-boxes

76. 69\150 (122). Diam. *c.* 20 mm. Seal-box lid with turned border of concentric circles and separately moulded figure of an eagle, standing frontal with wings outstretched, riveted through the centre. Heavily decayed and fragmenting.
Compare the examples from Richborough (Cunliffe 1968, 101, pl. XLIV no. 183); Cirencester (Wacher & McWhirr 1982, 93, fig. 26 no. 28, dated to the early Flavian period); another from the Walbrook 1954–5 (Guildhall Museum, n.d., 14, pl. VI no. 2, inv. no. 20.081); and an unpublished piece from Blake Street, York 1975–6 (SFNo 368, diam. 20 mm and similar to the Cirencester piece).
77. 53\2035 (576). Diam. 17 mm, height 6.7 mm. Seal-box base, circular with three circular perforations, part of the hinge survives. (Not illustrated)
78. 53\822 (329). Diam. 17.3 mm, height 3.6 mm. Circular seal-box lid with simple turned decoration, most of the hinge fitting is now lost.
Compare the piece with similar decoration from Wroxeter, described as ‘probably deposited before 150’ (Bushe-Fox, 1916, 28, pl. XIX, fig. 1).
79. 53\820 (333). Height *c.* 8.5 mm. ?Fragment of base of seal-box with part of the hinge surviving. (Not illustrated)

Fasteners and fittings

Studs, nails and rivets

Approximately 140 objects were recorded of which 19 are described here.

80. 55\150 (123). Max. diam. of head 13.1 mm, height 14.9 mm. Decorative turned stud or finial, shaft lost.
81. 69\255 (168). Diam. *c.* 12.5 mm, height 7.6 mm. Concave head of stud surviving in a small fragment with part of the shaft and with the complete transparent pale green glass ‘gem’ inset still intact.
Compare No. 94 with bibliography below.
82. 69\003 (015). Diam. of head *c.* 27.2 mm or greater, present size 20 by 23.2 mm, height 5.7 mm. Head of stud, probably once flat, but now slightly bent and nearly half lost. The upper surface was tinned or silvered and there is an engraved circle turned just inside the edge. (Not illustrated)
83. 57\027 (033). Diam. of head 7.9 mm, height 5.4 mm. Hollow-headed stud with deep V-shaped channel around the slightly raised centre spot, ?originally filled with enamel. The edge is a little damaged.
One piece from Lion Walk, Colchester came from a context dated 100–350 (Crummy 1983, 119, fig. 121 no. 3217); another from the Fortress Baths at Caerleon came from Drain Group 4 dated *c.* 160–230 (Zienkiewicz 1986, 178, fig. 59 no. 91, diam. 10 mm.); with a further example from Puckeridge, Herts. (Potter & Trow 1988, 63, fig. 26 no. 0).
84. 57\027 (035). Diam. of head 10.6 mm, height 3.7 mm. Flat-headed silver stud, damaged around the edge. A slightly larger example was found at Crook Street, Chester (SFNo CHE\CRS, 1973–4, 720, diam. 1.63–1.67 cm, height 0.43 cm), another comes from Doncaster (SFNo DT/NV, 5, 162, diam. 1.06 cm, height 0.44 cm).
85. 57\152 (187). Diam. *c.* 15 mm, present max. height 6.5 mm. Decorative fitting or mount with concave upper section, for paste ‘gem’ stone? Damaged, it appears to consist of a shell of sheet metal with the usual white composition filler still visible in places. The deep head is raised by four moulded ears on the underside. May have been a stud head, or applied or riveted on to some larger item.
86. 53\347 (134). Present size 6 by 8.1 mm. Incomplete stud with a repoussé design showing

the head of an emperor in right profile. Much of the head and all of the usual border are lost.

For a discussion of studs with this form of decoration see Feugère (1985, 126, 128 fig. 2, probably either Type 6 or 8, dated to the second half of the first century). Compare the better preserved example from Caerleon, 1965, found in a context dated Hadrianic to Antonine (Zienkiewicz 1986, 181, 183 fig. 60 no. 134).

87. 53\2567 (638). Present length 24.3 mm, width 10.5 mm, height 9.2 mm. Damaged stud or fitting, now roughly figure-of-eight shaped, in the form of a stylised female bust with incised details showing the full face, and an incised line across the brow to indicate the hair line or brow adornment. The wide neckline and dress are indicated with incised and punch-dot decoration. Only the remains of one rivet survives.

Compare a related stud from Caerleon which is in the form of a stylised bust of Minerva with a plumed helmet, and with a nail or rivet on the underside for attachment (Zienkiewicz 1986, 177–8, fig. 58 no. 59, pl. XIX c, from a drain context dated *c.* 160–230).

88. 53\2123 (565). Diam. of head 9.7 mm, length of shaft *c.* 12 mm. Solid subspherical pin with bent shaft of rectangular cross-section.

Compare the examples from Caerleon from a context dated 160–230 (Zienkiewicz 1986, 178, fig. 59 nos 80, 83, 84); from Corbridge (Bishop & Dore 1988, 187, fig. 88, no. 272; 188 no. 279); the amphitheatre at Chester (Thompson 1976, 198, fig. 28 no. 47, unstrat.); and Dwr-y-Felin House, Neath (Lloyd-Morgan 1992b, no. 16).

89. 53\2030 (559). Diam. of head was *c.* 12 mm, height 5.4 mm. Hollow domed-headed stud, head damaged and incomplete.

Compare the example from Scole, Norfolk, from a context dated Flavian-Trajanic (Rogerson 1977, 141, fig. 59 no. 57, pp. 102–7 for discussion of contexts and dating); from Corbridge (Bishop & Dore 1988, 185, fig. 87 no. 229); and the Arthur John Car Park, Cowbridge (Lloyd-Morgan forthcoming 41\085 (115) & (119)).

90. 53\2035 (573). (i) Diam. of head 10.8 by 12 mm, height *c.* 11 mm, complete with washer rivetted on at the end of the shaft, a little chipped; (ii) diam. of head 9.8 by 12.1 mm, height 9.5 mm, slightly angular head, a little damaged but otherwise complete; (iii) diam. *c.* 9.4 mm, fragmentary head only. Three hollow-domed studs. (Piece (i) only is illustrated)

91. 53\1825 (515). Diam. of ring *c.* 11.7 mm, overall length of fitting 25.5 mm, diam. of stud head 9.3 mm; strip in two adjoining fragments *c.* 136 by 21 mm; fragments of strip 12.6 by 15 mm, 16.8 by 18.9 mm, 12.1 by 13.3 mm, 14.5 by 24.3 mm; also double-layered fragments 14.3 by 19.6 mm, 11 by 17.2 mm. Strip or binding in several overlapping layers joined by crude sheet-metal rivets. A ring with a sheet-metal loop is held together by a concave-headed stud with inset glass-paste 'gem'.

The importance of this find is that it is the first example to be recorded by the present writer where a glass-headed stud of this type has been found in conjunction with metal strip or binding. For bibliography see No. 94 below.

92. 53\643 (254). Diam. was *c.* 13 mm or greater, height 2.8 mm. Flat-headed stud, the head decorated with a pattern of punched circles as border. Rather damaged.

Probably military; compare the pattern on the first-century studs from the Walbrook, London illustrated by Webster (1958, 85, fig. 6 no. 151).

93. 53\608 (225). Diam. of head *c.* 22.3 mm, height 10 mm. Hollow domed-headed stud with rounded convex cross-sectioned flange as border; much of the head is now broken and lost.

Compare the example from the Fortress Baths at Caerleon from a context dated to pre-100\110, diam. 22 mm. (Zienkiewicz 1986, 173, fig. 56 no. 14); and from Lion Walk, Colchester (Crummy 1983, 116, fig. 20 no. 3148 from a context dated *c.* 150–400; and perhaps also no. 3140 from a pre-150 context). (Not illustrated).

94. 53\310 (129). Diam. of head 8.2 mm, height 8.9 mm. Stud head with the concave head filled with the remains of a glass-paste 'gem'.

One example from Caerleon 1939 was found with pottery dated to *c.* 80–120 (cf. Fox 1940, 127, no. 5, fig. 5 no. 5); two others from the Fortress Baths came from a context

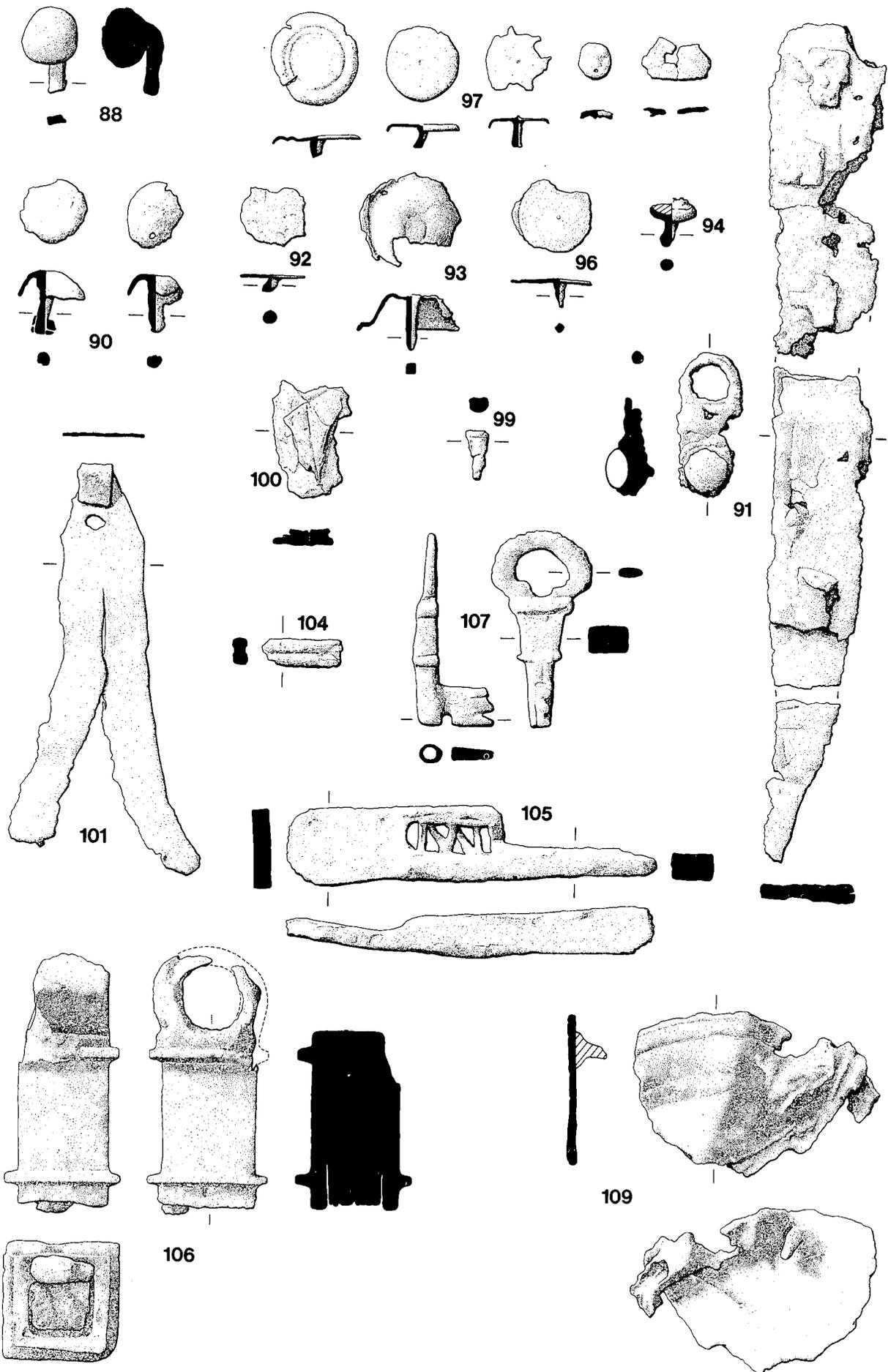


FIG. 97. Objects of copper alloy and silver. Nos 88, 90-94, 96, 97, 99-101, 104-107, 109 (1:1).

earlier than 100/110 (Zienkiewicz 1986, 175, fig. 56 nos 19 & 20). Another from the Deanery Field, Chester 1924–6 was ‘found in corner of room 2 [barrack] block A with a coin of Vespasian’ and dated to the late first century (Newstead 1928, 20, pl. ix no. 5); other more recent finds include an example from the Nemesium in the amphitheatre in 1966 (Thompson 1976, 195, fig. 28 no. 45).

95. 53\1000 (438). Diam. of head 9.2–9.8 mm, height 9.5 mm. Stud with concave cup-shaped head, probably originally filled with enamel or glass-paste ‘gem’ as No. 94. (Not illustrated).

96. 53\313 (096). Diam. head *c.* 17 mm, height 4.2 mm. Stud with flat head decorated with a single line incised as a border to the edge, and originally a slight flange turned back, but badly damaged and much of the edge and pin now lost.

Compare the example from Verulamium found in a context dated 150–250 (Frere 1984, 47, fig. 17 no. 152); and from the amphitheatre at Chester (Thompson 1976, 195 fig. 28 no. 46 unstrat.).

97. 53\1010 (370). (i) Diam. of head 13.2 mm, height 4.3 mm. Stud with a flat head, and the edge slightly turned back. The laboratory report notes remains of silvering on the head. Found with a fragment of leather, *c.* 12 by 7 mm, still attached. (Not illustrated)

(ii) Diam. of head *c.* 12 mm, height 5 mm. Stud as (i) but slightly smaller and less complete.

Compare the example from Corbridge (Bishop & Dore 1988, 185, fig. 87 no. 226, diam. 16 mm; also no. 225, diam. 15 mm). (Not illustrated)

98. 53\586 (281). Diam. *c.* 40–50 mm. Four fragments of a stud head with the edge turned back, (?or a circular plaque).

Compare the item from Cirencester (McWhirr, Viner & Wells 1982, fiche frames B13, B14 fig. 56 no. 74). (Not illustrated)

99. 53\345 (224). Length 8.7 mm. Tack made of rolled and folded sheet-metal, a little damaged.

Compare the examples from Baldock, Herts. (Stead & Rigby 1986, 134, fig. 58 nos 347–9); Northchurch Roman Villa and Boxmoor House School, Herts. (Neal 1974–6, 21, fig. xii no. 13; 80, fig. xlvi no. 27 respectively); Corbridge (Bishop & Dore 1988, 187, no. 27, length 14 mm, not illustrated) and from Hopyard Meadow in Cowbridge (Lloyd-Morgan forthcoming Site 43 IFNos 029, 035, 036, 037, 059, 073).

100. 53\1369 (478). Present size 20.4 by 14.6 mm. Originally diamond-shaped piece of sheet metal folded to make a crude rivet.

Compare the examples from Gadebridge Park, Hemel Hempstead where Neal suggests they were ‘probably improvised split pins or rivets from leather work’ (1974, 136, fig. 59 nos 104–6); Whitton, South Glamorgan (Jarrett & Wrathmell 1981, 187–8, fig. 74 nos 99 & 100 unstrat.); and Bear Field Cowbridge (Lloyd-Morgan forthcoming 67\152 (089)).

Plaques, binding and sheeting

Over 250 items, many of them probably associated, were recovered of which three are described below. The remainder consisted of fragments of plain sheeting, plaques or bindings, some of which contained nail-, tack-, or rivet-holes sometimes with the remains of the nail, tack, or rivet *in situ*. Some pieces had been folded into neat bundles.

101. 69\226 (149). Length *c.* 71 mm, max. width 36 mm, thickness 1.2 mm. Bifurcating strip used for ?binding with a hole for a square cross-sectioned nail towards one end, which is now folded over into a crude hook or catch.

102. 53\1591 (506). Largest piece *c.* 19.5 by 8 mm, thickness 0.03 mm. Five small pieces of rolled ?circular plaque with traces of repoussé decoration.

103. 53\355 (192). Size 16.3 by 11.8 mm, depth *c.* 3 mm. Fragment with traces of decoration in low relief, perhaps the corner of a plaque? (Not illustrated)

Wire and rods

22 items were recovered. A single item is described below.

104. 69\056 (060). Length 14.9 mm, cross-section *c.* 4.9 by 3.9 mm. Rod with sub-rectangular cross-section, lightly channelled along the length of the wider sides, decayed and encrusted. (Not illustrated)

Compare the unpublished piece with similar cross-section from Blake Street, York 1975-6 (SFNo 1103).

Locks and fittings

105. 69\070 (051). Dimensions 67.1 by 13.6 by 8 mm. Complete lock bolt.

Compare similar examples from Fishbourne, from the late third-century destruction level (Cunliffe 1971, 118, fig. 50 no. 136); and from Richborough (Cunliffe 1968, 104, pl. XLVI no. 205).

106. 69\155 (135). Present length 44.2 mm, cross-section *c.* 17.7 by 16.6 mm. Square cross-sectioned handle, with two neat angular collars at either end, and a terminal ring-loop belonging to a latch-lifter form of key. Part of the iron shaft is still *in situ*.

Compare a similar piece from a context dated 130-45 at Verulamium (Frere 1972, 130, fig. 39 no. 116).

107. 53\333 (781). Height 34.4 mm, max. width 18.5 mm. Rotary key with wards at right-angles to the plane of the ring.

Compare the virtually identical key from Cirencester (McWhirr 1986, 239, fig. 158 no. 7); and a less elaborate example from the Jewry Wall, Leicester from a level with a suggested late second-century date (Kenyon 1948, 258, fig. 86 no. 10; see 33-4 for discussion of the dating).

108. 53\090 (040). Dimensions 16.4 by 3.8 by 5.3 mm. Fragment from a small lock bolt? (Not illustrated)

109. 53\786 (362). Dimensions 29.2 by 44.9 mm, diam. was *c.* 80 mm, thickness *c.* 1.4 mm. Circular plate with turned concentric circles as a border, now fragmentary and with the remains of two nails *in situ*, possibly a keyhole plate.

Military items

46 items of military function were recovered, all, bar a few scraps, are published here.

Scabbard fittings

110. 57\138 (176). Length *c.* 88 mm, width *c.* 13.7 mm, height 8.4-8.7 mm, thickness 0.5-0.7 mm. Strip or binding with U-shaped cross-section, and no traces of any nail-holes.

Probably binding from a scabbard, used along the side, as in the example from Hod Hill (Brailsford 1962, 1, fig. 1 no. A14). (Not illustrated)

111. 57\445 (272). Three principal pieces - length 102.5 mm, width 13.2 mm, height 6.7 mm; length 75.2 mm, width 14.1 mm, height 6.5 mm; length 24.5 mm, width 13 mm, height 5 mm. Lengths of other fragments 27.7 mm, 19.3 mm, 23.1 mm (width *c.* 13.4 mm), 11.6 by 17 mm, 9.6 by 10.4 mm, 9.9 by 12.8 mm and a rectangular strip 36.3 by 11.3 mm. Fragment of scabbard binding with semi-circular cross-section and remains of a stylised palmette at each upper end, now much damaged. The two larger pieces have an applied reinforcing rib slightly off-centre.

Compare the example from Hod Hill (Brailsford 1962, 1, fig. 1 no. A14); and the fragment of chape with palmette-shaped terminals from Verulamium found in a context dated 90-110 (Frere 1984, 33, no. 72, fig. 11).

112. 53\1003 (365). Length 31 mm, max. width *c.* 17 mm, thickness *c.* 0.9 mm. Fragment of binding with linear longitudinal reeded decoration and remains of a nail-hole. Traces of tinning or silvering still remain on the undecorated reverse.

Part of a Roman scabbard mount, compare the virtually complete example from Hod Hill (Brailsford 1962, 1, fig. 1 no. A6).

113. 53\2354 (612a). Overall height *c.* 116 mm, present max. width *c.* 59 mm, present height of upper panel *c.* 46 mm, present height of lower panel *c.* 38.5 mm, height of plain centre panel with linear border *c.* 23 mm. Twenty-one fragments of sheeting which can be partially reconstructed to produce two incomplete panels with engraved and cut-out detail, with further details picked out with tinning or silvering for colour contrast. The two panels are each framed by a raised repoussé line lightly punched to suggest beading, and by a further series of approximately three raised repoussé lines along the top and bottom. Between the two panels is a plain narrow silvered panel with the remains of a nail-hole towards the centre. Another panel seems to have continued below the second, lower decorative panel. At an angle and attached along the right-hand side is what was originally a continuous series of raised repoussé lines. A further fragment (2354 (616)) with cut-outs and traces of decoration almost certainly belongs to this group.

These fragments represent the upper decorative panels from a Roman military sword scabbard. The plain centre panel would have taken a sword mount as No. 111 above with rings for attachment for the straps of the sword-belt. The cut-outs would have revealed the leather of the scabbard underneath and made a contrast with the polished copper alloy and the tinned or silver detail on the sheeting. From the upper panel traces can be made out on the right-hand side of a *vexillum*, with part of the fringed cloth and the ?handgrip, and towards the centre left perhaps part of the skirt or tunic hem of a figure. The lower panel shows, in the upper centre left, part of the upper portion of the *vexillum* and towards the right-hand side a Victory advancing left in left profile with a stylised palm branch over her left shoulder and her skirts billowing out behind her. Below her is a lentoid-shaped object, probably intended as a shield in side view, thrown down, and perhaps suggesting the captured spoils of an unnamed enemy. There are two very close parallels for this find, both as regards subject matter and technique – with the same cut-outs and engraved detail and the use of silvering to give a third contrasting colour. The first parallel is the more complete double panel found with the scabbard and iron sword in the Rhine at Oosterbeck, near Arnhem in the late nineteenth century (Stuart 1986, 105–7, pl. 142; Gerhartl-Witteven *et al.* 1989, 32–3, pls 3 & 4). The upper panel shows a warrior, or Mars, standing frontal with head turned right, flanked on the left with a *vexillum*, and with a standard of different type to the left. There is a shield in each of the lower corners, comparable with the surviving one in the lower Victory panel of the Loughor fragment. The lower panel of the Oosterbruck piece shows a figure, thought to be one of the Dioscuroi, in a chariot advancing right, with a palm tree in the background. This has been taken as a reference to the Jewish wars of Vespasian and Titus which were concluded in 70. The second and more recent find was made within the legionary base at Nijmegen in 1973 (Stuart 1986, 107; Gerhartl-Witteven *et al.* 1989, 32, no. 5). The upper panel clearly shows Victory advancing left with a palm branch over her left shoulder, in much the same fashion as on the lower Loughor panel, about to crown a successful warrior who stands frontal with head right and with a ?spear in his right hand, similar to the triumphant soldier on the upper Oosterbeck panel. The lower Nijmegen panel has on the left a defeated captive seated right on a shield facing a trophy and with a shield in the bottom right-hand corner. The border of cut-out triangles on the Nijmegen piece and the subject matter are much closer to the Loughor piece than those on the Oosterbeck example, but it is clear that the three scabbard panels are so closely related that, just as the Nijmegen piece is thought to be Flavian in date and from the same workshop as the Oosterbeck scabbard, so too the Loughor fragments must be of similar date. It is highly likely that it too came from the same workshop which has been suggested as being in the Netherlands perhaps even Nijmegen itself (Gerhartl-Witteven *et al.* *ibid.*).

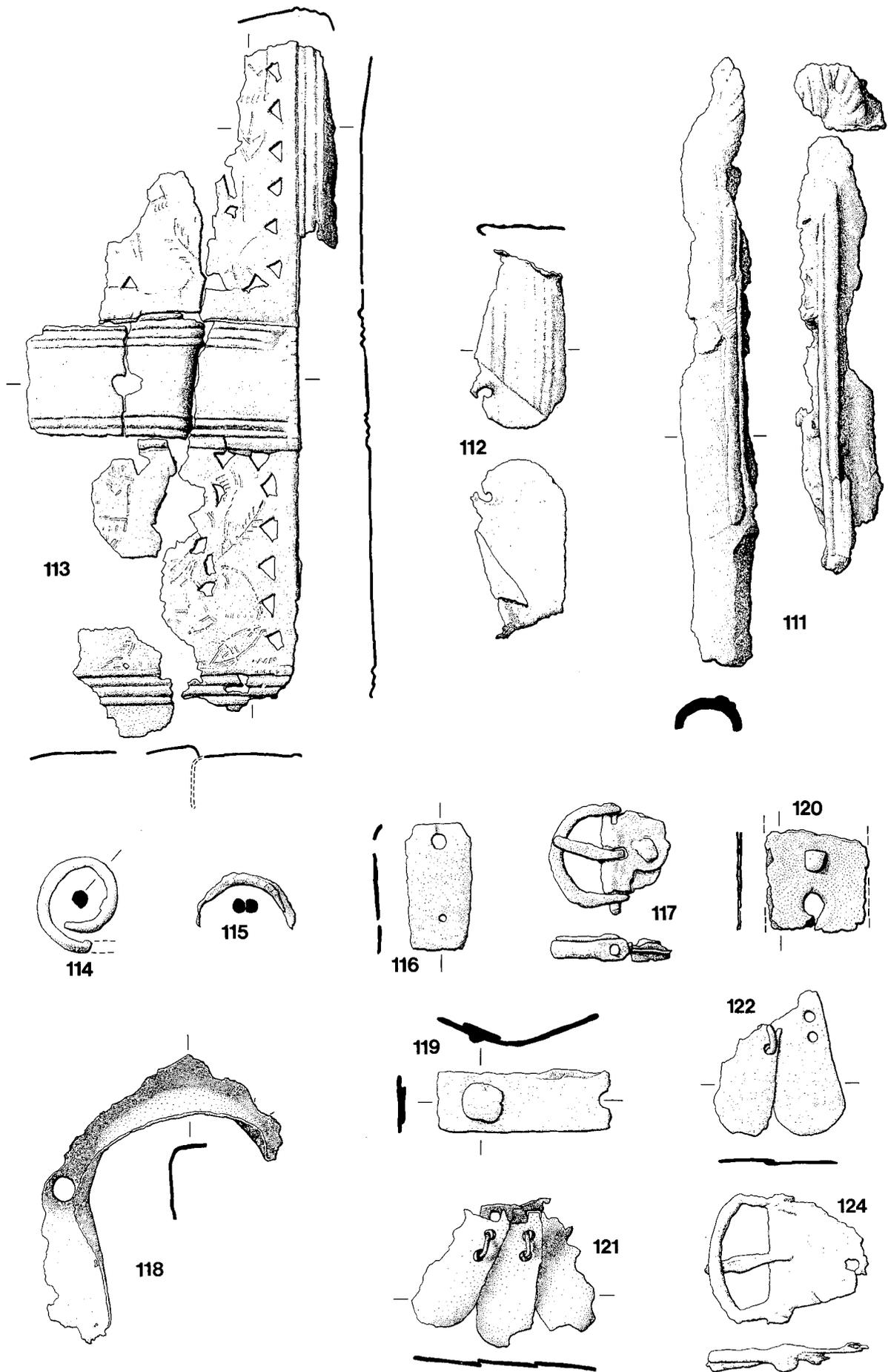


FIG. 98. Objects of copper alloy and silver. Nos 111-122, 124 (1:1).

Armour and armour fittings

114. 69\020 (077). Diam. *c.* 13.6 by 16.3 mm. Loop section of a girdle-plate tie-hook of a *lorica segmentata*. See No. 119 below with bibliography.

115. 69\243 (163). Diam. *c.* 18–19 mm, cross-section of wire *c.* 2 mm. Wire of roughly circular cross-section, notched to give the effect of beading, wound into a double ring, now in three pieces.

Compare the strips of beading applied to Imperial Italic helmet Type H of the late second to early third century (Robinson 1975, 73–4, pls 179–86, 192, 193); several strips of beaded bronze were said to have been found at Chester in the same context as Antonine dated pottery during the Princess Street dig (Newstead and Droop 1939, 42). Compare also the pieces from the legionary fortress baths at Caerleon (Zienkiewicz 1986, 193, fig. 61 no. 142, from a context dated 100/110–230; 186, fig. 62 nos 160, 161 from a late third-century context).

116. 57\006 (013). Length 22.6 mm, max. width 12 mm, thickness 0.8 mm. Buckle plate, one part only with remains of one rivet-hole, and a hole in the upper section for the loop of the pin to pass through.

Compare the almost complete buckle and buckle plate from Saham Toney, Norfolk (Brown 1986, 44, fig. 28 no. 197; 49, fig. 20 no. 227; fig. 31 nos 229, 231).

117. 57\063 (198). Present length 22.1 mm, max. width 19.8 mm. Buckle with pin and part of rivetted buckle plate from a *lorica segmentata*.

Compare the example from Fishbourne (Cunliffe 1971, 110, fig. 44 no. 89) and see No. 125 below.

118. 53\2353 (611). Max. height of flange for attachment 10.5 mm, max. width of projecting flange 12 mm, surviving length *c.* 68 mm. Incomplete fragment of a guard for the right ear, from a helmet, with L-shaped cross-section and two surviving rivet-holes.

Note the examples on the surviving helmets from the second and third quarters of the first century in Russell Robinson's study (1975, 46, fig. 75; 53–8 Imperial Gallic Type E pls 113–16; Type F pls 118–21; Type G pls 126–7; Type H pl. 136). A guard on the left ear is noted from Sheepen, near Colchester. Another example was found at the timber fortress of Elginhaugh, Lothian (pers. comm. L. Allason-Jones, 24 Sept. 1990).

119. 53\069 (043). Length 34 mm, max. width 10.7 mm, thickness 1.2 mm, diam. head of nail *c.* 7 by 7.2 mm. Strip with the remains of the head of a nail or rivet passing through one hole, the strip is broken across the second one. Bent and a little irregular. Possibly a girdle-plate tie-hook from a *lorica segmentata*.

Compare the complete examples from the first-century vexillation fort at Longthorpe (Frere & St Joseph 1974, 50, fig. 26 no. 31); Chichester (Down 1974, 141, fig. 8.15 no. 20); and Verulamium, found in a context dated 200–225 (Frere 1984, 33, fig. 11 no. 73).

120. 53\568 (198). Length 17.6 mm, width 18.7 mm. Part of the hinged section for a strap and buckle fitting from a *lorica segmentata*.

Compare the examples from Verulamium (Frere 1984, 33, fig. 11 no. 74 from a context dated 100–130); from Chichester (Down 1981, 166 fig. 8.30 no. 4; and 1978, 293 nos 18 & 19, fig. 10.30 and no. 25, fig. 10.31); and Hod Hill (Brailsford 1962, 3, fig. 3 nos A43, A54).

121. 53\586 (285). Dimensions 24.8 by 10.6 mm, 25.4 by 11.4 mm, and 24.7 by 11.5 mm. Three scales from a *lorica squamata* joined horizontally with two wire loops. Each scale is an elongated shield shape with traces of tinning/silvering, and is slightly damaged. Each piece would originally have had two holes on the upper edge and two on either side.

Compare the slightly wider scale from the first-century vexillation fortress at Longthorpe (Frere & St Joseph 1974, 50 fig. 27 no. 35); and the examples from Corbridge (Bishop & Dore 1988, 177, fig. 83 nos 138, 139).

122. 53\586 (286). Dimensions 19.6 by 10.6 mm and 25 by 13.5 mm. Two damaged scales

from a *lorica squamata* with tinning\silvering on the outer face, and joined with only one wire loop.

Compare No. 121 above.

123. 53\796 (320). Dimensions 21.6 by 11.1 mm. Damaged scale from a *lorica squamata* with the remains of one wire loop.

Compare Nos 121 and 122 above. (Not illustrated)

124. 53\1822 (524). Present length 29 mm, max. width 22.5 mm. Buckle, and part of the buckle plate from a *lorica segmentata*, complete with pin.

Compare the examples from the first-century vexillation fortress at Longthorpe (Frere & St Joseph 1974, 48, no. 22, fig. 26, complete, and 46, fig. 25 no. 16, demonstrating the method of fastening); from Richborough (Cunliffe 1968, 95, no. 110 and esp. no. 111 pl. xxxvi, with a suggested first-century date); and from Verulamium (Frere 1984, 33, fig. 11, no. 75 from a context dated 240–300; no. 76 from a context dated 375–380 with redeposited Antonine debris).

Belt plates and fittings

125. 69\003 (078). Length (i) 35 mm, (ii) 13.8 mm, max. width 9.7 mm. Belt or strap mount, incomplete and in two pieces with a rivet at either end. Most of the piece is encrusted but the central section may have been rectangular with a slightly curved cross-section. The terminals were probably sub-diamond-shaped.

126. 53\101 (034). Three military belt fittings as No. 129 below.

(i) Length 37.1 mm, max. width 17 mm, height 12.7 mm. One of the terminal knobs has been replaced by a crescent-shaped terminal, now damaged. One of the rivets is also damaged.

Cf. Frere for a set of five undecorated belt fittings of this type from Verulamium, one of which has a crescent-shaped terminal, and comes from a context dated 130–150 (1972, 120, fig. 33 no. 43).

(ii) Length 28.7 mm, max. width 7 mm, height 12.2 mm. The best preserved example, but part of one rivet is damaged.

A closely related piece came from a context at Verulamium dated 155\160 (Frere 1972, 120, fig. 33 no. 42); compare also the unstratified example from Richborough (Cunliffe 1968, 95–6, pl. xxxvii no. 124); and four examples from Corbridge (Bishop & Dore 1988, 182, fig. 86 nos 189–91, 192); also the unpublished piece from Priory Place, Chester 1989 (SFNo CHE/PP 89 140). Oldenstein dates these pieces to around the middle\late second century (1976, 188–90, taf. 58 nos 727–9). (Not illustrated)

(iii) Present length 16.4 mm, width 8 mm, height 7.9 mm. An incomplete example, the site of only one rivet survives. (Not illustrated)

127. 53\018 (385). Length 26.5 mm, max. width 6.1 mm, height 11.4 mm. Well-preserved military belt fitting with terminal knobs and rivets intact.

128. 53\310 (160). Length 27 mm, max. width 12.6 mm, height 10.5 mm. Military belt fitting similar to the preceding items, but with the addition of a swivel or hinge-fitting along one side; the rivets on the underside are a little damaged.

Cf. Oldenstein for a mid-second-century example from Munningen where an enamelled lunular pendant is attached to the swivel (1976, 164, taf. 45 no. 450).

129. 53\310 (124). Length 29.3 mm, max. width *c.* 8 mm, height *c.* 9 mm. Belt fitting with a narrow semi-cylindrical cross-section, with ribbed or segmented decoration on the upper curved surface, and a hemispherical knob at each end, with two rivets for attachment. The foot of one rivet with its washer is now lost, and the piece is generally decayed and split.

For parallels and discussion see Nos 126–8 above. (Not illustrated)

130. 53\643 (027). Present length 28.6 mm, width *c.* 9.5 mm. Military belt plaque, originally ?rectangular, now in two fragments each with the remains of one rivet.

131. 53\639 (279). Length *c.* 43 mm, width 15 mm, thickness 2.2 mm. Plaque inlaid with a regular series of small triangles of ?blue enamel in four longitudinal rows. These are framed

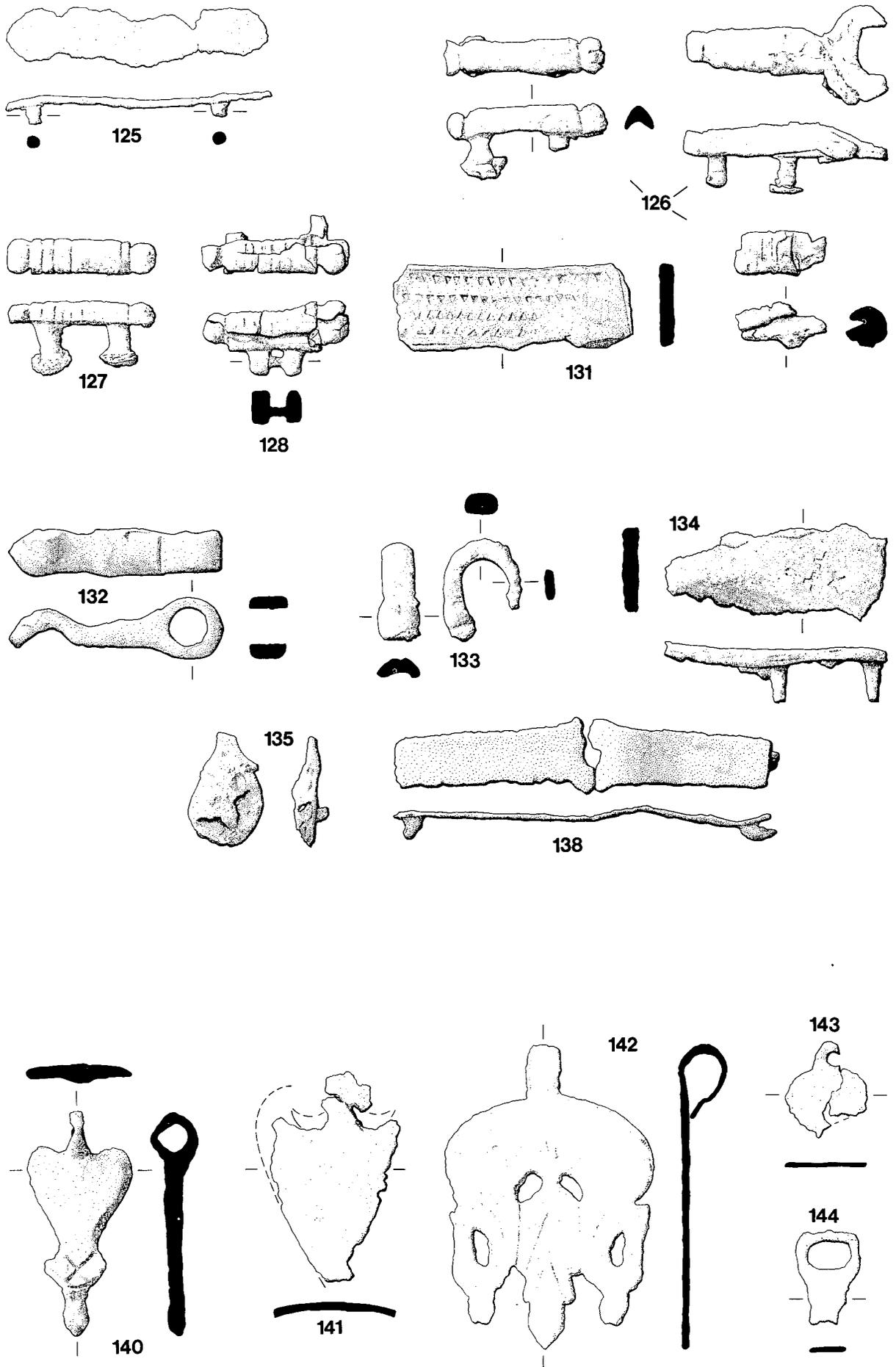


FIG. 99. Objects of copper alloy and silver. Nos 125-128, 131-135, 138, 140-144 (1:1).

by a single incised line. There are no traces of rivets or other attachments, and the piece is worn and has an irregular outline. Compare the related decoration on an unstratified buckle plate from Leicester (Hebditch & Mellor 1973, 47, fig. 19 no. 18) and part of the hinged buckle plates from Saalburg, Regensburg-Kumpfmühl, Eulbach and Holzturm Wp. 39, all dated to the first half of the second century (Oldenstein 1976, 197–8, taf. 64 nos 827–31).

Harness fittings and other horse-gear

132. 69\003 (001). Length 39.2 mm, max. width 7.8 mm. Buckle pin cast in one piece with some slight moulded detail. A little worn in places.

Compare No. 137 below.

133. 57\085 (153). Length *c.* 17 mm, max. width 8.2 mm, max. depth 15.2 mm. Hook-shaped fitting, being the loop from a harness junction strap unit with a moulded section just below the break.

Compare the examples from Verulamium (Frere 1972, 130, fig. 40 no. 125 a complete fitting from a context dated 105–115); from Corbridge (Bishop & Dore 1988, 173, fig. 82 no. 111); and from Gloucester (Webster 1960, 80, fig. 5 no. 100).

134. 57\251 (223). Present length 40.5 mm, max. width 16.1 mm. Damaged link from a harness strap connector, with two heavy integral pins and part of a washer on the reverse, with the remains of the loop attachment at one end. There are possible traces of ?decoration on the flat outer face.

Compare the examples from Hod Hill (Brailsford 1962, 2, fig. 2 nos A30, A32); and the less elaborate piece from Chichester (Down & Rule 1971, 45 fig. 3.15 no. 2).

135. 57\346 (251). Width 13.7 mm, length 19.1 mm. Disc-shaped silver terminal from a harness clip, with part of the adjacent concave-sided section. Part of the rivet for attachment remains *in situ*, with some encrustation from copper-alloy products on the outer face.

Compare the more complete piece of similar design from Verulamium found in a context dated 105–115 (Frere 1972, 130, no. 124, fig. 40).

136. 53\314 (100). Present length 20.2 mm, width *c.* 12.5 mm. Damaged loop section of a harness strap connector. Compare the rings with decorated links from Hod Hill (Brailsford 1962, 2, fig. 2 nos A31, A30 and the single link no. A32); from the first-century vexillation fort at Longthorpe (Frere & St Joseph 1974, 56, 58 with undecorated links); Corbridge (Bishop & Dore 1988, 175, fig. 83 nos 124 & 125) and from Gloucester, Wroxeter, and Sea Mills, Bristol (Webster 1960, 80, fig. 5 no. 101; 96, fig. 8 no. 247; and 89, fig. 7 no. 180, respectively). (Not illustrated)

137. 53\1727 (507). Length 45.5 mm, width 7.6 mm. Heavy pin from a large buckle, with the loop worn through. Probably from harness or similar heavy duty strapping. (Not illustrated)

138. 53\1009 (405). Length *c.* 67.5 mm, max. width *c.* 13.3 mm. A narrow rectangular plaque with central disc pierced by a nail- or rivet-hole, and with a rivet *in situ* at either end on the reverse side now broken across the middle. Belt plate from a cavalry harness?

Compare No. 139 below.

139. 53\1964 (543). Present length 37.7 mm, max. width 13.3 mm. ?Belt plate from cavalry harness, in the shape of a rectangle with central disc-shaped section pierced by a hole, but now broken with only one half remaining. The one surviving end has the remains of a rivet on the reverse side.

Compare No. 138 above.

Pendants

140. 69\003 (002). Length 39.2 mm, max. width 19 mm. Military pendant with loop cast in one piece and at right-angles to the plane of the pendant, and with incised decoration on the outer face.

The type is dated by Oldenstein from the mid-second to the third century (1976, 137–9,

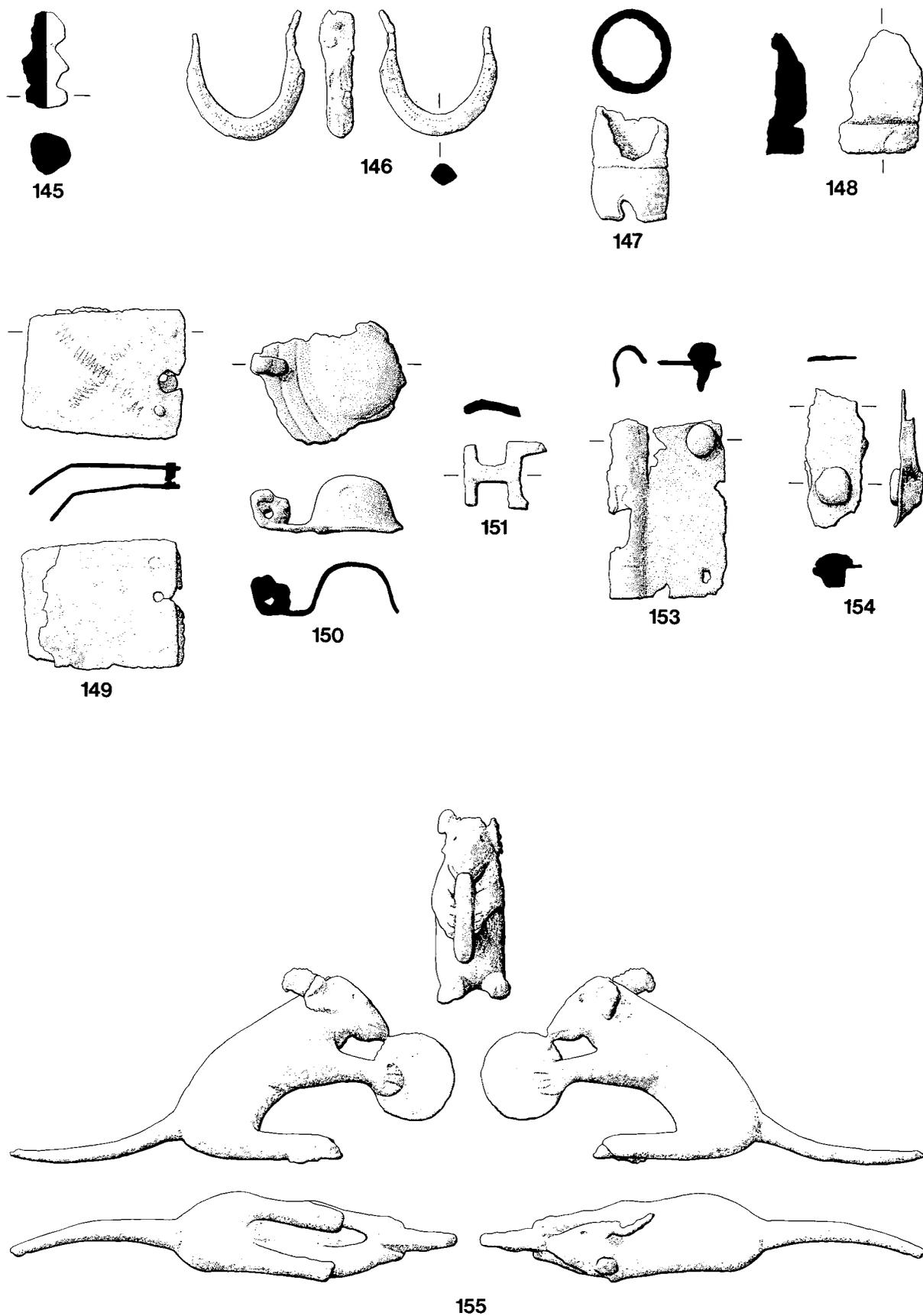


FIG. 100. Objects of copper alloy and silver. Nos 145-151, 153-155 (1:1).

taf. 34 compare nos 261–7). One example from Verulamium has a suggested date of the first century into the second half of the second century (Frere 1984, 36, fig. 12 no. 88). Compare also the examples from Cirencester (Wacher & McWhirr 1982, 114, fig. 38 no. 117, unprov.) and from South Shields (Allason-Jones & Miket 1984, 200, no. 3.660).

141. 66\018 (003). Present length 36.8 mm, max. width 23.2 mm, thickness 1.3 mm.

Leaf-shaped pendant or fitting, with the remains of two lunate holes in the upper section, and traces of some tinning/silvering, damaged and incomplete.

Compare the more complete, related example from Cirencester (Wacher & McWhirr 1982, 112, 114, fig. 38 no. 115) and the similar piece from Walbrook, London (Webster 1960, 86, fig. 6 no. 115).

142. 53\2532 (628). Max. width 38.4 mm, max. height with loop 53.2 mm, thickness 1.6 mm. A 'trifid' horse pendant, the outer face tinned or silvered, and decorated with lightly incised scroll decoration. The patterning is emphasised by four comma-shaped cut-outs. The loop for attachment to the *phalera* is intact.

Compare the related example with attached roundel from Fremington Hagg, Yorks (Webster 1971, 109, fig. 9 no. 2); and the example from Xanten dated to probably the mid-first century (Jenkins 1985, 146, 148, fig. 7 and 147 for dating). Note also the example from Site DT at Doncaster (Buckland & Dolby 1972 with pl. on p. 275).

143. 53\2279 (602). Max. width 15.2 mm, present length 16.7 mm, thickness 0.6 mm. Leaf-shaped pendant in two pieces, incomplete, made of sheet metal.

Compare the more complete example from Newgate, Chester 1955 (Thompson & Tobias 1957, 36, fig. 4 no. 17).

144. 53\1180 (494). Present length 16.7 mm, max. width 12 mm. Fragment of a small military pendant, being the upper section with the rectangular loop.

Compare the complete example from Richborough (Cunliffe 1968, 95, no. 120, pl. xxxvii).

Miscellaneous military items

145. 55\096 (101). Length 15.9 mm, max. diam 18.4 mm. Heavy pinhead or finial with subspherical terminal above a biconical moulding, and a disc-shaped section below. There is no trace of a shaft or other attachments.

Compare the small, more elaborate, stud head from the fortress baths at Caerleon (Zienkiewicz 1986, 178 fig. 59 no. 196, from Drain Group 4 = c. 160–230); and Birrens (Robertson 1975, 112 no. 49, fig. 32 no. 6 from a context dated Antonine 1 c. 142–155, cf. 286 for table of dates); also the larger unpublished example from Doncaster (SFNo DQ/FE (26)).

146. 55\274 (194). Length c. 21 mm, width 20.5 mm. Buckle loop with kite-shaped cross-section, decorated with fine punch-dots on either side of the raised angular edges, and with traces of the iron swivel in the flat end sections. Date uncertain; ?military.

147. 69\150 (123). Height 18.4 mm, diam. 13.5 mm. Tubular fitting with moulded collars at either end and a wider one in the middle, damaged by corrosion.

Compare the near identical piece from Ffrith, Clwyd (Blockley 1989, 149, fig. 5 no. 14); and the unpublished piece from Abbey Green excavations, Chester (SFNo CHE/AG 75 (1453)); and the related pieces from Fishbourne (Cunliffe 1971, 120, fig. 53 nos 180, 181 from Period I occupation = 43–75).

148. 69\251 (185). Height c. 20 mm, max. diam probably c. 20 mm. Terminal knob with wide collar, incomplete, probably a flawed casting.

Compare the example from Canterbury with the remains of a ?tang, said to be from a context dated 220–90 (Frere, Stow & Bennett 1982, 124, fig. 60 no. 28); also the similar piece from Dwr-y-Felin School, Neath (Lloyd-Morgan 1992b, no. 9).

149. 57\001 (001). Decorated plaque max. width 21.6 mm, length c. 29 mm, thickness c. 0.5 mm; back plaque max. width 21 mm, length 26.5 mm, thickness 0.6 mm. Strap end in two sections, with remains of two nails or rivets holding them together and still *in situ*.

The outer plaque is decorated with rocked engraved decoration in a saltire pattern. Both pieces have circular cut-outs in the wider upper end between the rivets, probably to accommodate the buckle pin.

Compare the zigzag ornament on the later fourth-century buckles (Simpson 1976, Group Ie, p. 193–5, fig. 1 no. 1).

150. 57\049 (146). Diam. *c.* 30 mm, height *c.* 6.7 mm. Fitting, probably military, consisting of a hollow domed boss with flat flange decorated with two turned or moulded concentric circles, and a small knobbed suspension hook at the edge. Most of the flange is now lost. There are no signs of pins or rivets for attachment.

151. 53\1002 (359). Present length 14.7 mm, width 11.5 mm. T-shaped connector, incomplete.

Compare a similar piece from Gorhambury, St Albans (Neal, Wardle & Hunn, 1990, 130, fig. 26 no. 208).

152. 53\993 (384). Dimensions 22.7 by 9.7 mm, thickness *c.* 0.4 mm. Sheet fragment with remains of a single dome-headed rivet *in situ*, and a hole for a nail with a square cross-sectioned shaft. Perhaps a fragment of a buckle plate or strap fitting? (Not illustrated)

153. 53\1139 (456). Length 21 mm, width 30 mm, diam. head of stud *c.* 6 mm. Incomplete fitting with flat rectangular section with two nail-holes at one end, one with the round head of a nail or rivet still *in situ*. The other, broken, end is curved. Perhaps a buckle plate or a plume holder.

For a complete plume holder from Hod Hill cf. Brailsford (1962, 2, fig. 2 no. A21).

154. 53\1729 (509). Length 23.3 mm, max. width 10.7 mm, diam. of head of stud 6 mm. Strap fitting, consisting of two sections joined together by a dome-headed rivet. The outer piece retains traces of tinning/silvering and appears to be slightly shaped.

Objects and waste material associated with metalworking

The site archive includes 88 fragments of slag, waste and other products derived from secondary repairs rather than primary working. Two pieces (Archive Nos 479 & 482) may, however, have been derived from casting. For a discussion of the production of copper-alloy fittings, and later replacements, see the article by Oldenstein (1977). The situation there is directly relevant to that experienced by workshops in *castra* in Britain.

Miscellaneous

The Mouse

155. 53\310 (151). Height 32.1 mm, max. width 13.5 mm, overall length from cake to tail 78.7 mm, diam. of cake *c.* 14.8 mm. Freestanding statuette of a mouse seated but leaning forward and holding between its front paws a flat circular cake, in the same plane as the line of the body, and appearing to be on the point of eating. Its ears are pricked back; the left one is now a little damaged. The tail sticks out straight behind and nicely balances the piece when seen in side view. The eyes and whiskers are suggested with engraved detail.

Statuettes of mice are not uncommon, and have been found not only in Britain but on a number of Roman sites elsewhere. The best known example from this country came from amongst disturbed grave goods found in the cemetery at Mount School, York. Here the mouse is crouched down, with the tail curled round into a vertical ring (Eburacum 1962, 100b, pl. 34). Less well-known is the mouse from Kenchester illustrated in the *Victoria County History for Herefordshire* (Page 1908, 182 fig. 7). Green notes that it came from the site of what may have been a Romano-Celtic temple, and that the finds are all in Hereford Museum (1976, 169, item no. 5). A series of some eighteen mice can be found in the Greek and Roman Department of the British Museum. Some clearly hold pieces of fruit, including one with a pear held in its front paws (Walters 1899, 255, no. 1871, inv. no. 1975.3–1.1, length 54.5 mm); another crouches down holding a spherical

item, perhaps a cherry or an apple (Walters 1899 cat. no. 1861 inv. no. 67.5–8.803 ex Blacas collection 1867). Eight of the mice hold identifiable flat circular cakes, five in the same fashion as the Loughor mouse (Walters 1899, 255 cat. no. 1865 inv. no. 59.2–16.14; cat. no. 1867 inv. no. 1875.3–1.4; also inv. no. 1975.3–10.18 and .15 and inv. no. 78.10–19.93). Three others hold out cakes with one paw clutching the edge, with the other diametrically opposite, and seemingly about to take a bite out of the top edge. The cakes are marked with an 'X' on the outer side, clearly visible to the viewer, giving the impression that a 'hot cross bun' is being tackled, though this may represent no more than a stylised representation of the circular Roman loaf which was marked across the top before the final stage of baking (Walters 1899, 255 cat. no. 1864 inv. no. 1975.1–1.3; cat. no. 1860 inv. no. 81.10–81.1; also inv. no. 1975.3–10.16). Unfortunately there are no details of provenance or dating in most cases, apart from the name of the donor, or the collection to which they previously belonged. Similarly two mice auctioned in London have no details of provenance, only a suggested date of first- to second-century (Christie's auction sale 11 July 1990, 58, lots 212 & 213 with pl.). Fortunately there are some better documented examples. One piece now in the Museum Calvet, Avignon, is very similar to ours, the only difference being the tail which curls up to touch one shoulder (Rolland 1965, 129 no. 265 with two pls, inv. no. J194 height 3.2 cm from the Department of Haute Provence). There are four pieces in the Rheinisches Landesmuseum Bonn, two from the Isenberg collection with no further provenance (Menzel 1986, 64 no. 143 taf. 81 inv. no. U 1270; 66 no. 137 taf. 81 inv. no. U 1271 eating fruit) and two further mice eating fruit – the first, sitting up, comes from Cologne; the other, crouched on a small rectangular plinth, was found at the legionary camp of Vetera, at Xanten kreis Moers (Menzel 1986, 66, no. 138, taf. 81 inv. no. 1020; and no. 139, taf. 81 inv. no. 33748 respectively).

The choice of mice may seem a curious subject for artistic endeavours but one can be seen on a mosaic showing an 'unswept floor' of the type made famous by Sosos at Pergamum, scattered with nutshells, bones and other debris (Pliny, *Nat. Hist.* xxxvi.184), the mouse is represented with its beady eye intent upon half a walnut shell with the kernel still intact (Wheeler 1964, 204–5, pl. 191 with detail in Toynbee 1973, 204, pl. 101, from the Aventine at Rome, now in the Lateran collection in the Vatican Museum). Toynbee also notes several other representations in mosaic and sculpture (1973, 203–4). There are a number of intaglios which show mice. Henig records a red jasper set in an iron ring from Colchester dated to the first century, which has an animal, possibly a mouse, in profile (1974 vol. II, 84, no. 623 pl. XIX), and more curiously a mouse leaping out of a nautilus shell, on a red jasper from Corbridge (*ibid.*, 57, no. 393, pl. XIII). In his discussion of these rings, Henig notes that Pliny stated that white mice were a happy omen (*Nat. Hist.* viii.223) and that there is a chthonic aspect to the symbolic use of mice (1974, vol. I, 130–1). He also notes that mice were sacred to Apollo Smintheus at the sanctuary at Hamaxitus, site of the ruined city of Marpessos in the Troad, and this is further discussed in Peter Levi's footnote to the section devoted to the sanctuary, and the sibyl Herophile, in his translation of Pausanias' *Guide to Greece* (Book x, Phokis, cf. chap. 12 sect. 2–4, 1971, 1979, 436–7, n.79). As the mouse gives birth to pink, furless, and blind young, and at frequent intervals, it can be seen as a symbol of fertility. Where it is associated with a shell as on the Corbridge intaglio, where the shell was thought of as symbolic of the womb, then it can also be seen as a promise of rebirth. Whether the owner of the Loughor mouse was consciously aware of this or merely regarded the figure as a 'lucky piece' is unknown. Certainly the find of a mouse in the cemetery at York would suggest a hope of rebirth to a bereaved family; and the finds from military bases at Vetera and at Loughor would give hope of luck, and survival, in battle and rebirth of the brave spirit at the end.

Bells

156. 69\304 (179). Height of bell *c.* 104 mm, diam. at shoulder 42.5 by 51.2 mm, clapper length *c.* 74.5 mm. Sub-cylindrical bell similar to No. 158 below, but with a more oval

cross-section. The lower part of the bell, including the flared mouth, is now lost, and the surviving fragments cannot give the complete profile. The iron club-shaped clapper is now in two fragments but is otherwise virtually complete.

157. 53\3333 (782). Height 25.7 mm, max. surviving width 21.3 mm. Angular suspension loop of a bell with part of the domed upper section. The integral iron loop to which the clapper was originally attached is still *in situ*. The fragment could have come from either a cylindrical- or a rectangular-mouthed bell of the types described below. (Not illustrated)
158. 53\3390 (734). Height of bell 71 mm, max. diam. *c.* 47 by 29 mm, length of clapper 47.1 mm. Roughly cylindrical-shaped bell with slightly flared foot and domed upper section with angular suspension loop and oval-shaped hole. The lower body of the bell is squashed and part of the edge lost. Most of the club-shaped iron clapper has survived, and although in two pieces the upper looped section is still attached to the interior loop.

One of the larger bells of this type, now in the Vorarlbergisches Museum, Bregenz inv. no. 13.31, was noted by Mutz and has a height of 205 mm. He also illustrates a smaller example, height 114 mm, in the Rijksmuseum van Oudheden te Leiden, inv. no. 111225 (1972, 158–60, pls 454–7; 158, pl. 453 respectively). Bells of the same type have been reported from Kingsholm, Gloucester (Hurst 1985, 32, fig. 12 no. 43 from a post-Roman context); and from a third-century context at Wroxeter (Atkinson 1942, 210, pl. 51 no. A290).

159. 53\3390 (784). Height 46 mm, max. cross-section at mouth 28.2 by 39.2 mm. Complete bell with sub-rectangular cross-sectioned mouth, tapering towards a domed top. There are the usual small knobs at each of the rounded corners of the mouth, and the suspension loop has an angular outline pierced with a rounded hole. The roughly club-shaped iron clapper is suspended from the internal loop in a similar fashion to No. 158 above.

Cunliffe reports a bell of this type from a first period level (= 43–75) at Fishbourne (1971, 112, no. 107, fig. 46); and other examples have been found at Richborough (Bushe-Fox 1932, 79, pl. x no. 18 unstrat.); Brecon (Wheeler 1926, 116–17, fig. 58 no. 16 unstrat.); Newstead (Curle 1911, 117, pl. LIV no. 1 from Barrack Block XI in the *praetentura*); Chester (unpublished SFNo CHE/HSS 1981 (1599)); and Camerton (Wedlake 1958, 258, fig. 59 no. 29). The smaller bells would most likely have been attached to horse trappings, whilst the larger pieces could well have been used to ornament carts and wagons. In either instance they could have been used by the military or the civilian population.

Miscellaneous

160. 55\175 (143). Length 26 mm, max. width 13.8 mm, depth 2.1 mm. Mount in the form of an openwork dolphin with incised details. The tail and lower part of the body are now lost. The remains of one rivet can be seen on the reverse near the head end. Roman.
161. 55\092 (097). Dimensions 15.5 by 25.8 mm, thickness (not including rivet) *c.* 6 mm. Fitting with roughly triangular outline and remains of one rivet can be seen on the reverse. The upper face is incised 'III[I]', uncertain use but probably Roman?
162. 55\001 (005). Dimensions 42 by 77.8 mm, thickness *c.* 5.5 mm. Diamond-shaped plaque with two connected recesses on one side. (Not illustrated)
163. 55\123 (145). Length 12.6 mm, cross-section 6 by 7.1 mm. Broken section of a finial or moulding from an implement, rectangular cross-section. (Not illustrated)
164. 55\042 (046). Dimensions 13.6 by 11.9 mm, thickness 3.2 mm. Oval-shaped disc or washer, pierced by ?nail rather decayed. (Not illustrated)
165. 69\047 (134). Length 42.2 mm, max. width 19.2 mm, height 13.2 mm. Fitting or binding with expanding semi-circular cross-section and a serrated angular edge.
166. 69\005 (025). Length 37.5 mm, height 22 mm, max. thickness *c.* 3.7 mm. Heavy moulded fragment with variable curved cross-section, probably not from a vessel.
167. 57\011 (021). Height 27 mm, max. diam. at foot 21.8 mm. Slightly irregular ferrule, or foot from an item of furniture, with a small flange at the base.

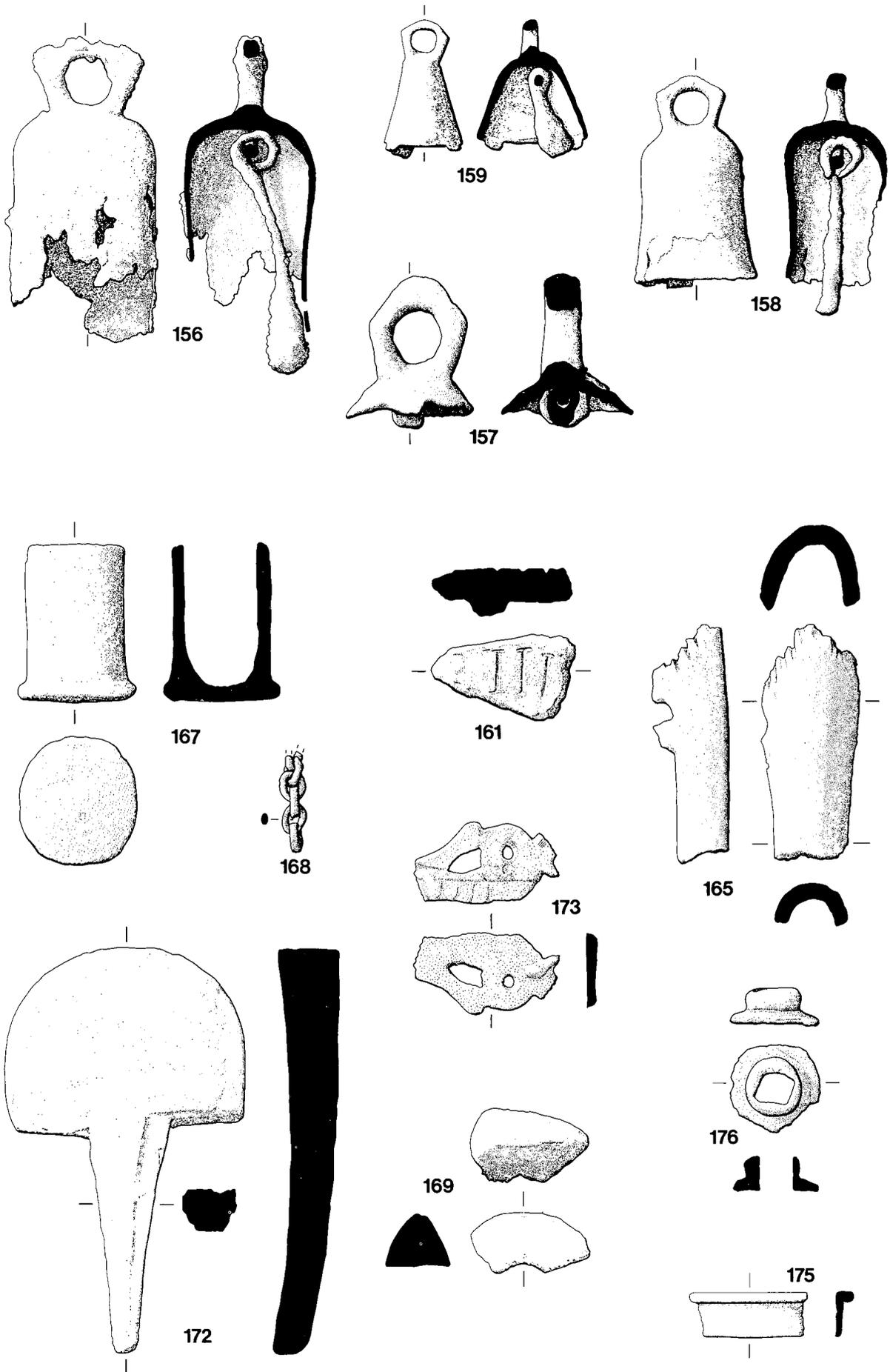


FIG. 101. Objects of copper alloy and silver. Nos 156-159 (1:2), 161, 165, 167-169, 172, 173, 175, 176 (1:1).

- Compare the ferrule from Coventina's well dated second to third century (Allason-Jones & McKay 1985, 30, no. 75 & fig.); and from Canterbury from a context dated 290–360 (Frere, Stow & Bennet 1982, 124, fig. 60 no. 21).
168. 57\088 (095). Several fragments of a chain, single loop-in-loop, now fragmentary.
169. 57\142 (165). Radius *c.* 15 mm, depth 12.7 mm. Fragmentary curved fitting with irregular triangular cross-section, part of a heavy loop or ring from a vessel or ?military item.
170. 57\015 (048). Dimensions 25.8 by 20.7 by 6 mm. Irregular oval disc with a white surface deposit from decayed lead or solder corrosion products. (Not illustrated)
171. 57\011 (025). Dimensions 11.8 by 10.2 by 10.7 mm. Cube-shaped offcut. (Not illustrated)
172. 53\2353 (609). Height 70.7 mm, max. width 44.3 mm, thickness 10.9 mm. Crude rough-out for a ?lynch pin. Consisting of a heavy semicircular head with tang of tapering rectangular cross-section. Undecorated. Compare the example described as a cart fitting from a Boudiccan destruction layer at Sheepen, Colchester (Niblett 1985, 115, fig. 68 no. 69).
173. 53\786 (867). Two fragments – (i) dimensions 10.1 by 6.6 mm, thickness 1.6 mm; (ii) dimensions 7.4 by 6.2 mm, thickness 1.1 mm. Openwork plaque with square grid.
Compare No. 179 below. (Not illustrated)
174. 53\2035 (701). Present length *c.* 13.3 mm, max. width 2.7 mm. Split pin or fitting, incomplete and a little bent. (Not illustrated)
175. 53\2960 (702). Height 8 mm, max. width 3.2 mm, diam. *c.* 30 mm. Moulded collar for a vessel or other item.
176. 53\2920 (801). Max. diam. head *c.* 16.7 mm, height 6.2 mm, aperture 6.3 by 6 mm. Collar or mount for a nail or rod with square cross-sectioned shaft, with a slight flange at the base.
177. 53\492 (173). Height 57 mm, width 36.8 mm, max. height at centre 6 mm. Openwork pendant or escutcheon with central domed boss. The openwork decoration is emphasised by a border of light punch dots with scroll patterns visible in the upper and lower sections. The three projecting angles are slightly domed. Most of the upper loop is now lost. Date uncertain but perhaps Roman, ?military.
178. 53\568 (200). Height 38.5 mm, width 17.4 mm, thickness 1.4 mm. Damaged pendant or escutcheon with a border of small triangular piercings. The suspension loop is eroded and at some time has been replaced or augmented by a copper-alloy rivet through one of the upper holes, perhaps suggesting that the piece had been attached to a vessel.
179. 53\1042 (397). Dimensions 33.3 by 23.1 mm, thickness *c.* 1.3 mm. Irregular openwork fragment with square grid.
Compare the example from Malton, Yorks., where it is suggested that it may have been used to decorate a wooden casket (Mitchelson 1964, 253, fig. 19 no. 32).
180. 53\1048 (403). Dimensions 16.4 by 16.4 mm, thickness *c.* 2.6 mm. Fragment of openwork fitting.
181. 53\1139 (455). Length 13.3 mm, width 9 mm, thickness 1.6 mm. Fragment with heavily incised diagonal line part way across, from a ?bracelet.
182. 53\820 (383). Length 13.9 mm. Fragmentary buckle pin or fragment of offset handle of Roman spoon? (Not illustrated)
183. 53\1361 (502). Dimensions 31 by 8.5 mm, height 8.7 mm. Loop made from a crude offcut of heavy sheet metal, with a sub-rectangular aperture. (Not illustrated)
184. 53\Unstrat. (018). Dimensions 22 by 12.4 mm, diam. was *c.* 20 mm, max. depth *c.* 3.6 mm. Fragment of disc pierced by two holes. (Not illustrated)
185. 53\597 (237). Dimensions 8.1 by 5.5 mm, depth 0.9 mm. Damaged and fragmentary fitting, the edges chipped, pierced by a nail-hole. (Not illustrated)
186. 53\601 (338). Dimensions 12 by 12.5 mm, thickness 1.3 mm. Sheet-metal offcut with nail-hole, used as a washer? (Not illustrated)
187. 53\818 (344). Dimensions 8.6 by 4 by 3.4 mm. Wedge- or truncated-cone-shaped fragment. (Not illustrated)

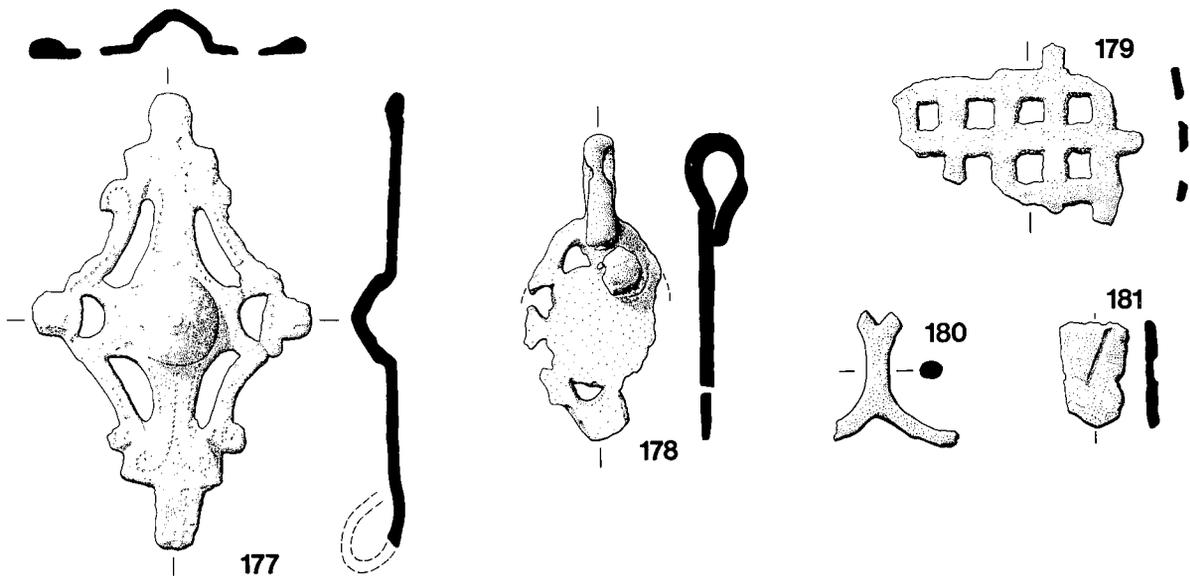


FIG. 102. Objects of copper alloy and silver. Nos 177–181 (1:1).

188. 53\1139 (460). Height 7.2 mm, max. diam 6.7 mm. Broken fitting of rough hollow cone shape, uncertain function. (Not illustrated)

IRONWORK (FIGS 103–104; PLS XVII–XXII) By M. Dawson

Introduction

In Wales the study of ironwork has not been extensive although the publication of the British Museum catalogue (Manning 1985a) provides a useful benchmark. The Loughor ironwork is the largest collection to date from an auxiliary fort in Wales and in this context forms an interesting and important, if not spectacular, assemblage.

The majority of the collection reflects the utilitarian, rather than decorative nature – tools, weapons, constructional and other fittings – of most Roman ironwork assemblages, and particularly those from military sites.

Only two objects (Nos 1 & 2) of personal adornment or non-specifically military dress were recovered, but to these can be added two rings with intaglios surviving (see M. Henig's report Nos 1 & 3, and another ring fused with one of copper-alloy, G. Lloyd-Morgan's report No. 34).

Hobnails are very common finds on Roman fort sites, although few complete boot soles have been recovered in Britain. The assemblage of boot types is however increasing with the collections from Bar Hill, (Robertson, Scott & Keppie 1975), London (Miller & Rhodes 1974), and more recently Cowbridge (Oetgen, forthcoming). However, the Loughor material adds little, if anything, to this body of evidence.

Household utensils are solely represented by cauldron fittings. Amongst the writing implements the possible pen nib (No. 11) is of particular interest.

Parts of two tyres and a lynch-pin are the only identifiable vehicle fittings. A snaffle-bit (No. 17) is worthy of note from the items forming horse gear.

Files generally, and the small 'rats tail' file particularly, are not common on Roman sites because corrosion destroys the delicate surface and the remaining core becomes indistinguishable from nail fragments. All the chisels found at Loughor were used for carpentry, their light cross-section suggesting use on wood, although Manning (1985a, 21) suggests some of these types could be used on soft stone such as clunch.

Two anvils (Nos 20 & 21), a *dolabra* (No. 109), three keys (Nos 68–70), and a stud (No. 43) were found in association with a box or casket from a pit on Site 53 (Contexts 2353, 2354)

which is discussed more fully in the report on the copper-alloy objects. The keys here and other examples found elsewhere at Loughor are well-paralleled by Manning (1985a, 88–97); his typology is followed here.

Other fasteners and fittings comprised studs, nails, split ring loops, staples, brackets, hinges, clamps, ferrules, roves, bindings, and window and door fittings; in this collection these serve no more than to reflect the wide range of different functional applications of Roman ironwork.

The use of *lorica segmentata* and *lorica hamata* cannot be confined to auxiliary or legionary use and is of little use in establishing garrison identity as archaeological evidence supports its widespread use (Maxfield 1986, 68–72). *Lorica hamata* is, however, less frequently attested in the archaeological record; the technique of manufacture has been detailed by Burgess (1953).

It is equally unsafe to attempt to attest garrison presence on the basis of weaponry alone. At Loughor the presence of four ballista bolts is odd, as these weapons in the first to mid-third centuries are generally held to be solely for legionary issue (Campbell 1984, 75). However, these objects (Nos 92, 97, 98 & 100) all come from contexts (55/069, 69/056, 53/069) associated with the reduction of the primary fort,⁵ and are therefore associated with works presumably carried out by a legionary detachment.

A general classification of Roman military spearheads from Britain has been attempted by Marchant (1990), but late first-century spearheads (Nos 84, 87, 89, 90 & 91 here) have not received systematic study apart from the reappraisal of the early assemblage from Hod Hill (Manning 1985a, 159–70). Amongst the other weaponry a trilobate arrowhead (No. 96) and a caltrop (No. 105) are worthy of note.

Shelf assemblage

The most significant group within the Loughor assemblage is the collection from Site 53 Context 3390, probably a collapsed shelf within Room DD of the *praetorium* Building 3.10. This group comprises an awl (No. 4), a ‘rats tail’ file (No. 22), a punch (No. 25), two chisels (Nos 32 & 33), and an S-shaped knife blade (No. 38) in association with a staple (No. 48), two strap hinges (Nos 60 & 61), an iron sheet (archive No. 883), and two rings (Nos 113 & 114). The hinges, the principal structural elements, suggest the presence of a box, possibly to contain the tools noted above. The iron sheet may well have been part of the reinforcing binding from the box, if not part of the contents. Boxes in Roman military contexts are known at Corbridge (Allason-Jones & Bishop 1988, 94–6) and Richborough (Bushe-Fox 1949, xlvi), in civilian locations a box is known at Chalk (Johnson, D.E. 1972, 133) where it is referred to as a large wooden chest, although there are files and chisels present. Nothing remains to indicate the size or construction of our box except the two hinges. These have arms, or straps, of 100 mm and 120 mm (No. 61) and 105 mm (No. 60), sizes which are comparable with hinge straps from the Corbridge chest (Allason-Jones & Bishop 1988, 61 and 116 fig. 84). This suggests that the Loughor chest could have been as large as 800 mm by 500 mm by 400 mm, yet hinges on a box from the Butt Road cemetery, Grave 69, at Colchester with arms of 117 mm were part of a casket suggested as only 240 mm by 110 mm by 120 mm (Crummy 1983, 86–7).

From the context of the discovery it is clear that this assemblage is neither a closure deposit or a hoard but the accidental loss of an everyday tool-box, wherein lies its importance; the constituents of the tool-box form a diverse group. The punch and burred chisels suggest that a hammer should have formed part of the tool kit; in contrast the small file, the knives, and awl would have been used for lighter work perhaps on leather or sheet metal, both iron and copper-alloy. In the Roman army the one area in which both heavier and light work is to be expected is that of the armourer.

Archive

The ironwork from the fort at Loughor comprises *c.* 5,200 items or parts of objects,⁶ of which 118 are described here.

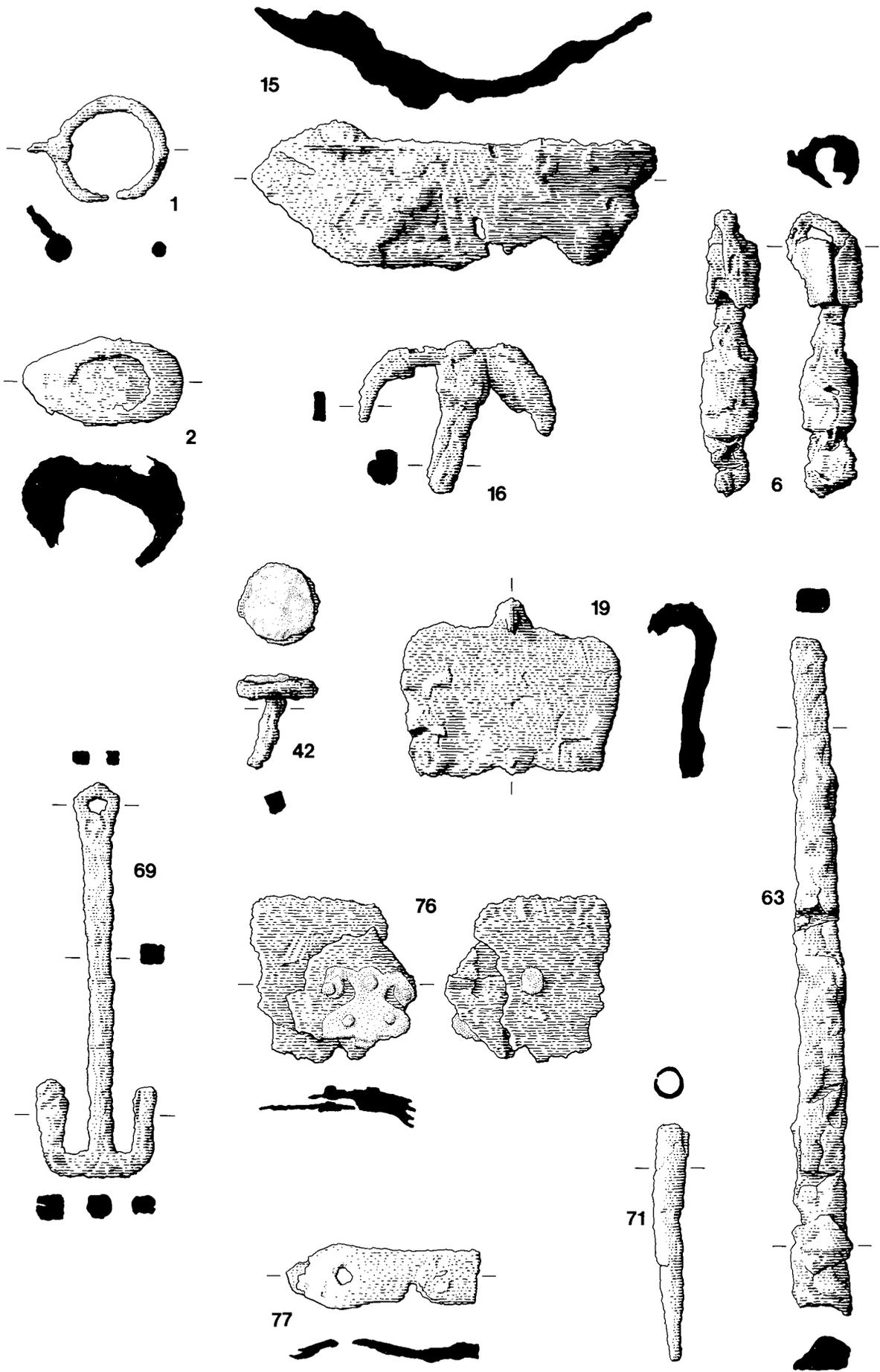


FIG. 103. Ironwork Nos 1, 2, 6, 15, 16, 19, 42, 63, 69, 71, 76, 77 (1:2).

Catalogue

Objects of personal adornment or dress

Brooches

1. 57\089 (107). Diam. 32 mm. Penannular brooch, with central pin broken (Fowler 1960, Type C). Brooches of this type with rolled back terminals are generally considered to date to A.D. 1–60 (Stead & Rigby 1989, 98, 102, 358).

Rings

2. 55\149 (248). Internal diam. *c.* 19 mm. Finger-ring, broken and slightly distorted. Bezel survives without intaglio.
See also report on Intaglios by Henig, Nos 1 and 3, and on Objects of Copper Alloy and Silver by G. Lloyd-Morgan, No. 34.

Hobnails

A minimum of 380 hobnails, including a number of groups and several fragments of heel plates were noted, but there were no complete or sufficiently large fragments of shoes surviving for any conclusions to be drawn.

Objects associated with the manufacture and working of textiles

Awls

3. 57\127 (142). Length 144 mm, broadest width 18 mm. Awl, tapering square-sectioned tool with tang similar to Manning (1985a) E7. (Not illustrated)
4. 53\3390 (785). Length 120 mm. Awl, tapering head with tapering circular-section tang (Manning 1985a, E9 Type 4a). (PL. XVIII)

Needles

5. 53\2279 (605). Length of shank 57 mm, length of eye 18 mm. Needle shank and eye. (Not illustrated)

Household utensils

Cauldron fittings

6. 57\067 (292). Overall length 95 mm. Cauldron suspension hook; double-ended with split spacing washers still adhering at top and bottom (cf. Manning 1983).
7. 69\034 (049). Internal diam. 15 mm, external diam. 38 mm. Possible washer of cauldron suspension hook, very corroded (cf. Manning 1985a, 10). (Not illustrated)
8. 53\3131 (809). Chain. Four links of chain, possibly part of a cauldron chain (cf. Manning 1985a, pl. 64, S13).
9. 53\3300 (811). Chain. Four links of chain, possibly part of a cauldron chain (cf. Manning 1985a, pl. 64, S13). (Not illustrated)

Objects associated with trade and communication

Writing equipment

10. 57\161 (188). Length 14 mm. Small object or part object comprising a wedge-shaped terminal with corroded shaft fragment, now hollow. Further fragments of the solid shaft

appear to be sheathed in copper alloy. The object is probably the remains of a stylus of which only the spatulate end survives with a short length of sheathed body. Manning's Type 4 (1985a, pl. 26, N25) is similar but not identical. (Not illustrated)

11. 53\1009 (833). Pen nib. Once referred to as cattle goads, these objects have been found at Vindolanda with ink adhering suggesting that they were actually pen nibs (Birley, A. 1989). (Not illustrated)
12. 53\1084 (829). Length 46 mm. Spatulate end of rectangular-section stylus with broad elongated blade (cf. Manning 1985a, N17). (Not illustrated)
13. 53\3414 (820). Length 46 mm, stem section *c.* 2 mm by 2 mm, spatula width 12 mm. Probably spatulate end of stylus. (Not illustrated)

Objects associated with transport

Vehicle fittings

14. 53\2035 (595). Length 58 mm, width 30 mm, thickness 11 mm. Fragment of possible wheel tyre, slightly curving. (Not illustrated)
15. 53\2480 (623). Inner hub lining. Curving fragment of tapered section with parallel sides (Manning 1985a, 72, H35-7).
16. 53\2530 (632). Length 50 mm, width 67 mm. T-shaped end of lynch-pin. The arms of the 'T' are bent.

Horse gear

17. 55\077 (279). Twin-looped link from snaffle-bit. Comprises two D-shaped loops linked by bar of iron (Hyland 1991, 27-35).
18. 53\611 (264). Length 48 mm, width 26 mm, thickness 4 mm. Possible horse-shoe fragment. (Not illustrated)
19. 53\1002 (356). Fragments of possible hipposandal.



PLATE XVII. Ironwork No. 20.



PLATE XVIII. Ironwork Nos 4, 22, 25, 32, 33, 38, 48.

Tools

Metalworking tools

Anvils

20. 53\2353 (617). Small tapered rectangular anvil block. In use this would have been mounted on a large wooden block and used as the striking face during forge work (Manning 1985a, 1). (PL. XVII).
21. 53\2354 (618). Dimensions face 37 by 37 mm, shank 7–11 mm. Field anvil (head only) with square striking face and tapering shank. (Not illustrated)

Small field anvils are commonly used to sharpen the blades of sickles and scythes and in a military context could be used for swords, knives, and possibly spears. The edge of the blade is hammered cold on the slightly domed head of the field anvil. The anvil itself is held steady by the tapering spike stuck in the ground through a sheet metal collar pierced to allow only the spike through thus supporting the head.

Files

22. 53\3390 (880). Length 129 mm. 'Rats tail' file, square-sectioned with tapering tang. The teeth of the file survive on its lower surfaces indicating all four sides were once covered with teeth (PL. XVIII). There is one possible parallel from Bletsoe (Dawson, forthcoming).

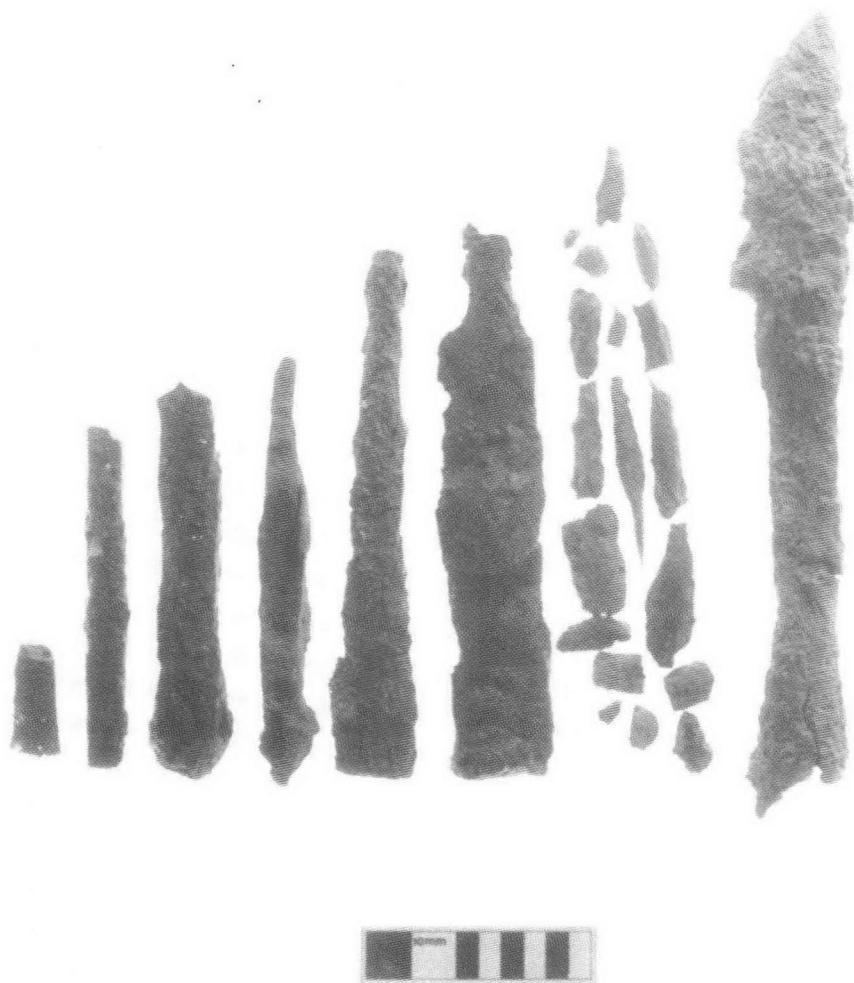


PLATE XIX. Ironwork Nos 23, 24, 26-31, 34.

Punches

23. 69\034 (213). Length 56 mm. Punch; lozenge-shaped, tapering body. Corrosion too great to clarify indications of wear or shape of point. (PL. XIX)
24. 69\220 (146). Length 93 mm, diam. 12 mm. Punch; long tapering bar with burring at struck end, blade end tapers to point (cf. Manning 1985a, pl. 5, A23). (PL. XIX)
25. 53\3390 (879). Length 80 mm. Punch; square-section punch tapers to a point. The upper body made of circular-section bar with head burred by use. (PL. XVIII)
26. 53\3476 (675). Length 50 mm. Smith's drift or punch; short tapering iron wedge, burred at struck end (Manning 1985a, 10, pl. 5, A23). (PL. XIX)

Woodworking tools

Chisels

Parts of nine chisels, all used for woodworking, were recovered, two fragmentary examples are omitted here.

27. 55\275 (264). Length 94 mm. Shank diam. 8 mm. Fine carpenter's chisel; circular-section shank tapers to splayed blade. No evidence of wear survives. (PL. XIX)
28. 69\056 (215). Length 183 mm. Small damaged chisel with burred end. (PL. XIX)
29. 69\149 (121). Total length 116 mm, dimensions of blade 22 by 91 by 6 mm, dimensions of tang 25 by 6 mm. Mortice chisel. Wide flat blade with short rectangular tang. (PL. XIX)

30. 53\568 (204). Socketed wood chisel, broken with end of blade missing. The shape of the socket, the intermediate shank and broad blade and shoulder serve to identify this as a chisel (Manning 1985a, pl. 10, B37). (PL. XIX)
31. 53\2100 (577). Length 111 mm. Rectangular-sectioned wood chisel with body tapering from struck end to wider flat blade. (PL. XIX)
32. 53\3390 (881). Length 205 mm. Paring chisel. Long thin blade tapering to a wide splayed cutting edge. The struck end of the chisel has evidence of burring suggesting heavy use of a tool intended for lighter paring work. (PL. XVIII)
33. 53\3390 (882). Length 155 mm. Firmer chisel; long square-sectioned body tapers to splayed blade. Considerable burring indicates heavy use of this general purpose tool. (PL. XVIII)

Construction tool

Mason's trowel

34. 55\313 (233). Length 69 mm. Possible mason's trowel. Flat near-oval blade with angled shank broken before tang. (PL. XIX)

Knives and blades

Parts of 14 knives or blades were recovered; five examples are reported here.

35. 55\083 (078). Length 44 mm, height 23 mm, tapering section 3 mm–1 mm. Short broken fragment of blade. (Not illustrated)
36. 69\042 (223). Length 51 mm, height 16 mm. Crescent-shaped blade fragment. (Not illustrated)
37. 53\1020 (884). Length 55 mm, width 11 mm. Possible tang fragment with remnant of single rivet. (Not illustrated)
38. 53\3390 (783). Knife blade. Elegant S-shaped knife with tapering square-sectioned tang and copper-alloy ferrule ring. Curved blade tapers to a point. Manning's Type 24 (1985a, fig. 29, Q75). (PL. XVIII)
39. 53\3414 (668). Length 38 mm, width 3–4 mm. Blade fragment, possibly double-edged. (Not illustrated)

Hook

40. 57\189 (212). Section diam. 8 mm, width across hook 54 mm. Small hook with circular section tapering to a point. Possible a large fishing-hook. (Not illustrated)

Fasteners and fittings

Studs

Six studs were recovered; three are reported here.

41. 53\1841 (840). Diam. 36 mm. Domed pierced disc; probably head of decorative stud with central shank now corroded away. (Not illustrated)
42. 53\1948 (649). Length 32 mm, diam. head 27 mm, shank section 6 mm by 6 mm. Stud with square-sectioned shank sheathed in copper-alloy.
43. 53\2354 (887). Diam. head *c.* 35 mm. Stud head, now sub-circular and largely only corrosion products. (Not illustrated)

Nails

Nails make up the majority of the iron assemblage, forming 87 per cent of the minimum total. However, an accurate assessment of the quantities and types of nails found during the excavations has been hindered by two factors: firstly the fire at the Trust's headquarters in 1983, in which much of the material recovered in 1982 and the first half of 1983, particularly from Sites 53 and 57, was lost; secondly the generally poor quantity of the assemblage made any kind of identification difficult in many cases, and weights impossible to estimate with any degree of accuracy, with a few exceptions (see below).

The figures given below, therefore, represent such information as can be established from the available data comprising surviving identifiable examples and site records, although the latter do not include details of heads present or weight.

Minimum fragments present	4520 (possible max. 7040)
Minimum count from heads present	2230
Total minimum weight	35 kg

In the few circumstances where accurate measurements were possible, lengths were noted as ranging from *c.* 40 mm to upward of 150 mm, and weights between 2 g and *c.* 65 g.

Among the assemblage from Site 53 were a few sizeable groups (especially Contexts 786, 2022, 2027 & 2030) and from these and other contexts with carbonised nails a more accurate determination of nail size is possible. Of twelve examples examined, lengths ranged between 43 mm and 59 mm, with tapering square-section shanks and flat heads of irregular shape or almost completely round, between 9 mm and 14 mm across, with the majority between 10 mm and 12 mm. With one exception the weight was consistent at 4 g. These nails were similar to Group E from Inchtuthil (Manning 1985b, 289–92, fig. 86 on 290). Examples of Manning's Group Ai from the same site were also noted within the total assemblage.

Split-ring loops

44. 53\1841 (831). Length 35 mm, external diam. 28 mm. Split-ring loop (cf. Manning 1985a, pl. 61, R44). (Not illustrated)
45. 53\2241 (592). Overall size 51 by 44 mm, internal diam. 18 mm, diam. across loop *c.* 10 mm. Split-ring loop with one clenched, and one angled end. (Not illustrated)

Staples

Five possible staples were recovered, four are reported here.

46. 53\2027 (553). Two staples:
 - (i) Length of spikes 80 mm and 35 mm, width 60 mm. Open staple with flat section. (Not illustrated)
 - (ii) Length of spike 54 mm, width 35 mm. Staple fragment with flat section; one surviving spike. (Not illustrated)
47. 53\2030 (563). Large U-shaped staple, possibly structural from a building or cart. (Not illustrated).
48. 53\3390 (787). Section 3 by 5 mm, width 35 mm. Staple fragment, with rectangular section and one spike-stub surviving. (PL. XVIII)

Brackets and angled iron

A minimum of nine possible brackets or angled iron were recovered; seven are reported here.

49. 55\002 (236). Length of arms 25 mm, width 13 mm, section 2–3 mm. Two angle-brackets, both formed of flat-sectioned iron, possibly from a box. (Not illustrated)
50. 55\288 (205). Length 75 mm, angled arm 17 mm. Angled iron, either drop-hinge or bracket. (Not illustrated)

51. 55\447 (252). Lengths 35 mm and 40 mm. Angled fragment of hinge or bracket. (Not illustrated)
52. 69\056 (214). Length 55 mm, width across flat section 23 mm. Angle iron. Possibly angle-bracket of a box. (Not illustrated)
53. 54\169 (026). Dimensions:
 - (i) Length 65 mm.
 - (ii) Lengths 65 mm and 10 mm.
 - (iii) Lengths 40 mm and 15 mm.
 - (iv) Lengths 35 mm and 15 mm.
 - (v) Lengths 30 mm and *c.* 10 mm.
 - (vi) Length 40 mm (from X-ray).

Six fragments of angled iron, possibly from a box. Piece (i) has fragment of angled arm surviving. (Not illustrated)
54. 53\600 (641). Lengths 59 mm and 55 mm. Angled bracket. (Not illustrated)
55. 53\3148 (814). Looped bracket or handle, formed from single piece of iron. The loop may once have been closed. Similar to a split-pin loop but with one arm bent at a right-angle. Probably part of a larger item. (Not illustrated)

Hinges

At least eleven items, which can be identified as forming parts of hinges were recovered; six are reported here.

56. 57\299 (228). Box hinge. Strap-hinge, with hinge loop intact and two leaves partially surviving. (Not illustrated)
57. 53\096 (048). Length of spike 73 mm, length of arm 45 mm. L-shaped part of drop-hinge, square-sectioned. (Not illustrated)
58. 53\353 (168). Length 67 mm, diam. of loop 50 mm. Split-pin with flat section and circular loop with circular section. (Not illustrated)
59. 53\3300 (812). Split-pin loop with circular section, and clenched through iron plate. (Not illustrated)
60. 53\3390 (789). Length 105 mm. Hinge arm. Single part of strap-hinge, very similar to No. 61 and bent in antiquity. Square-section suspension loop hole which had been chiselled. Two circular, punched holes for nails were evident on X-ray. The strap is rectangular in section. (Not illustrated)
61. 53\3390 (877). Strap-hinge. Complete example with one arm bent in antiquity. Two securing nails survive *in situ*. Both nails are square-headed with square shanks. The hinge loop was bent and forge-welded into place. Probably a box or door hinge wrenched from its mounting. (Not illustrated)

Clamp

62. 55\246 (169). Length of shank 35 mm, width 19 mm, width across 'T' 51 mm. Corroded part of upper end of T-clamp (cf. Manning 1985a, R70-1). (Not illustrated)

Window fitting

63. 55\064 (065). Length 230 mm. Long thin slightly distorted bar, with upturned ends. Probably part of the strap of an iron window frame similar to that from Hinton St Mary (cf. Manning 1985a, R17-8). Two holes 110-112 mm apart, similar to R17, are present.

Door or gate fitting

64. 57\088 (106). Length 230 mm, width 20 mm, thickness 10 mm. Latch-lifter; flat section bar with shallow U-shaped end. (Not illustrated)

Keys

Eight examples were recovered of which six are reported here.

65. 57\085 (159). Lengths 60 mm and 74 mm. Lift-key in two fragments (cf. Manning 1985a, pl. 40, 033). (Not illustrated)
66. 57\142 (295). Square-sectioned stem 11 mm by 11 mm tapering to rectangular end 5 mm by 2 mm. L-shaped lift-key. Comprises three fragments of a copper-plated key. The shank terminates in a rolled suspension loop. The three teeth of the key are of unequal length probably the result of corrosion (cf. Manning 1985a, pl. 40, Type 034). (Not illustrated)
67. 53\997 (828). Key fragment (cf. Manning, 1985a, pl. 40, 029). (Not illustrated)
68. 53\2353 (607). Length 119 mm. Lift key. (Not illustrated)
69. 53\2354 (614). Lift-key. Complete key with square-sectioned stem and hooked end.
70. 53\2354 (659). Length 83 mm, section 10 mm by 8 mm. Key stem with rectangular section. (Not illustrated)

Ferrules

Ten possible ferrules were recovered, three are reported here.

71. 69\163 (142). Length 78 mm, diam. 10 mm. Hollow tapering conical ferrule.
72. 53\815 (835). Diam. 11 mm, width 6 mm, thickness 2 mm. Washer-type ferrule. (Not illustrated)
73. 53\3804 (692). Length 56 mm, diam. (max.) 6 mm. Ferrule; long tapering socketed object. (Not illustrated)

Roves

Four objects which may be roves were noted. The forms vary between circular- and diamond-shaped, sizes between 28 mm and 47 mm with central piercings 7 mm and 12 mm across.

Bindings

Nineteen possible binding fragments were recovered representing the remains of *c.* fourteen (probable) objects which have insufficient surviving characteristics to identify their precise form; of these four have piercings and one may be part of a hinge.

Military equipment

Armour

Lorica segmentata

74. 55\263 (253). Length 32 mm. Small hooked end of *lorica segmentata* hinge, tapering in U-shape from spatulate end to circular section of hook (Allason-Jones & Bishop 1989, fig. 64). (Not illustrated).
75. 69\280 (191). Dimensions 21 mm by 12 mm. Small fragment of *lorica segmentata* hinge with central perforation for rivet. (Not illustrated).
76. 53\431 (170). A total of nine fragments of (?)plate armour, of which the following are the most distinguished. Some of these pieces have the remains of grass or straw adhering.
 - (i) Max. dimensions 42 by 37 mm. Lobate hinge of *lorica segmentata*, still attached to plate armour, folded in antiquity.
 - (ii) Max. dimensions 55 by 49 mm. Fragment of plate with small bronze rivet. (Not illustrated)
 - (iii) Max. dimensions 45 by 25 mm. Plate fragment with hinge lobe still adhering. (Not illustrated)

(iv) Max. dimensions 70 by 20 mm. Plate fragment with rolled edge; there is a fragment of wood adhering at one point along this edge. (Not illustrated).

77. 53\2027 (558). Length 68 mm. Hinge. Large hinge of *lorica segmentata* cuirass (Allason-Jones & Bishop 1989, fig. 64).

Lorica hamata

78. 55\073 (277). Ring diam. 3 mm. Chain mail, five fragments. (Not illustrated)
79. 57\085 (313). Ring diam. 5 mm, with some larger rings of diam. 7 mm. Chain mail, two fragments. (Not illustrated)

Swords and daggers and their fittings

80. 55\037 (037). Max. width 46 mm. Sword or dagger tip. This weapon blade is either the damaged remnant of a sword or spearhead. The maximum width is comparable with that of a large Roman spearhead (cf. Manning 1985a, V139). Similarly the possibility exists that this may be a broken sword tip, the V-shaped profile is particularly reminiscent of a sword of Mainz type (Ulbert 1969). (Not illustrated)
81. 69\005 (216). Fragment, now broken, with a central perforation reminiscent of a dagger tang (cf. Manning 1985a, V14). (Not illustrated)
82. 57\121 (139). Fragment of dagger handle, comprising part of the central strip of composite binding (cf. Manning 1985a, V14). (Not illustrated)

See also report on Dagger Sheath by Ian Scott (below p. 288).

Spearheads

83. 55\064 (081). Length 127 mm, blade width 27 mm. Spearhead; leaf-shaped blade with small socket. (PL. XX)
84. 55\246 (251). Length 86 mm. Spearhead; socketed leaf-shaped blade. Tip broken. (PL. XX)
85. 57\027 (063). Length 125 mm. Spearhead; broad blade. Blade only survives. (PL. XX)
86. 57\088 (083). Overall length 147 mm. Spearhead; long narrow spearhead, socket survives with rivet intact. (PL. XX)

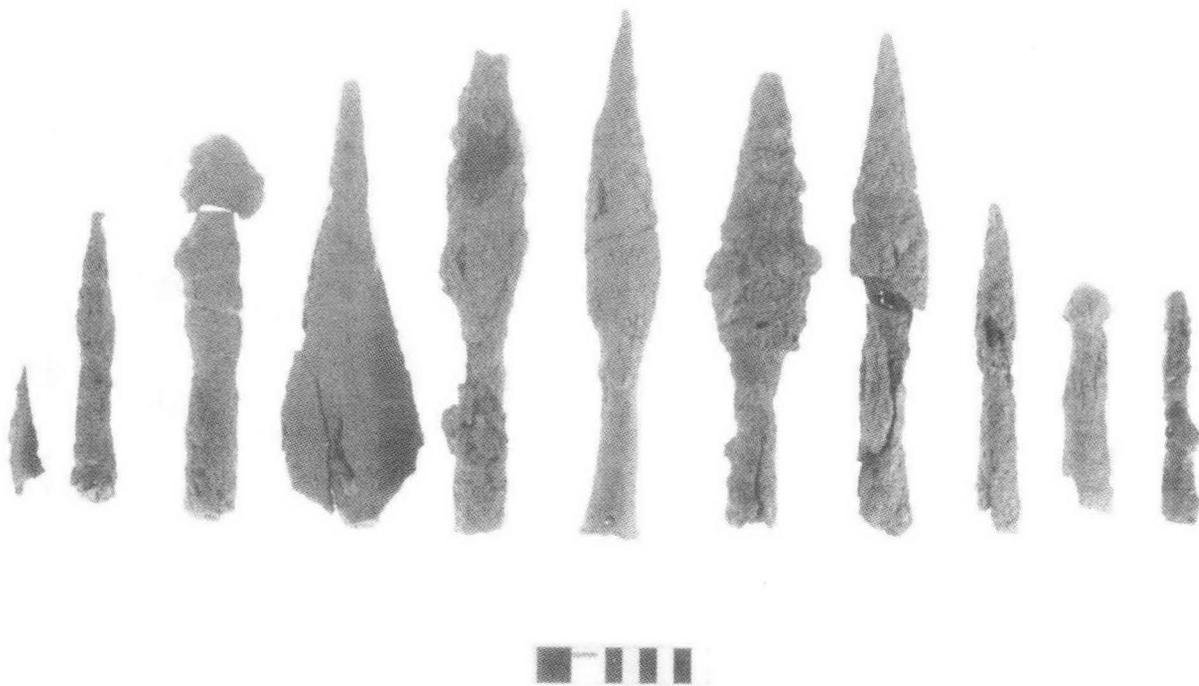


PLATE XX. Ironwork Nos 83-86, 89, 91, 92, 95, 97, 98, 103.

87. 57\166 (192). Length 104 mm, width 26 mm. Spearhead; broken. Socketed. (Not illustrated)
88. 57\067 (185). Length 146 mm. Spearhead; leaf-shaped, socketed with securing rivet-hole still surviving. (Not illustrated)
89. 53\609 (232). Length 145 mm. Spearhead; socketed. Shouldered blade. (PL. XX)
90. 53\1139 (452). Length 140 mm, width at broadest point 22 mm. Spearhead; socketed with leaf-shaped blade. (Not illustrated)
91. 53\1296 (498). Length 115 mm, width at broadest point 32 mm. Spearhead; truncated but may once have been socketed, leaf-shaped blade. (PL. XX)

Arrow or bolt heads

92. 55\066 (243). Length 64 mm. Bolt head; probably from a ballista bolt, socketed (Manning 1985a, pl. 83, V204). (PL. XX)
93. 55\154 (131). Length 51 mm, square section *c.* 12 mm. Projectile point, very corroded. (Not illustrated)
94. 55\179 (193). Length 66 mm, width 23 mm, length of socket or tang 23 mm. Fragment of leaf-shaped arrow or (?)spearhead. (Not illustrated)
95. 55\179 (215). Overall length 64 mm, blade length 32 mm, socket length 32 mm. Arrowhead; socketed with narrow angular blade. (PL. XX)
96. 55\242 (172). Arrowhead; triple-ribbed head, with no evidence of barbs (Manning 1985a, 178, V282). (Not illustrated)
The trilobate arrowhead is probably of eastern origin (Davies 1977). In the pre-Antonine period these appear to be particularly common, but post-Antonine finds are few (Coulston 1985a, 265, fig. 46)
97. 69\056 (102). Length 91 mm. Socketed artillery bolt head. (PL. XX)
98. 69\056 (237). Length 81 mm. Socketed artillery bolt head. (PL. XX)
99. 69\227 (165). Length 57 mm. Arrowhead or bolt head, triangular-shaped. Discussed by Manning (1985a, 170–1, Type 1, V185) who concluded that these were fired by *catapultae*. (Not illustrated)
100. 53\069 (028). Ballista bolt head. (Not illustrated)
101. 53\656 (269). Combined length 82 mm (in two pieces). Arrow or javelin head, socketed. (Not illustrated).
102. 53\740 (324). Length 56 mm. Arrowhead; fragment of blade only survives (Manning 1985a, pl. 85, V255–7). (Not illustrated)
103. 53\1139 (830). Length 37 mm. Arrowhead; triangular-sectioned (cf. Manning 1985a, V282). (PL. XX).
104. 53\3414 (820). Length 60 mm, thickness *c.* 2–3 mm. Probable arrowhead, very corroded (cf. Manning 1985a, pl. 85, V281). (Not illustrated)

Caltrop

105. 53\1208 (508). Dimensions *c.* 21 by 40 mm. Possible caltrop. Three sharpened points in a large body of corrosion. (Not illustrated)

Buckle

106. 53\1002 (360). D-shaped buckle loop with basal loop of pin just surviving. Similar to others identified from Zugmantel by Oldenstein (1976, 1027, taf. 27), but not closely dated. (Not illustrated)

Belt slide

107. 69\020 (218). Length 78 mm, width 19 mm, bent return 13 mm. Part of possible belt slide.
108. 53\2302 (625). Length 66 mm, width 11 mm. Belt or scabbard slide, the top part only survives as a wide shallow U-shape.

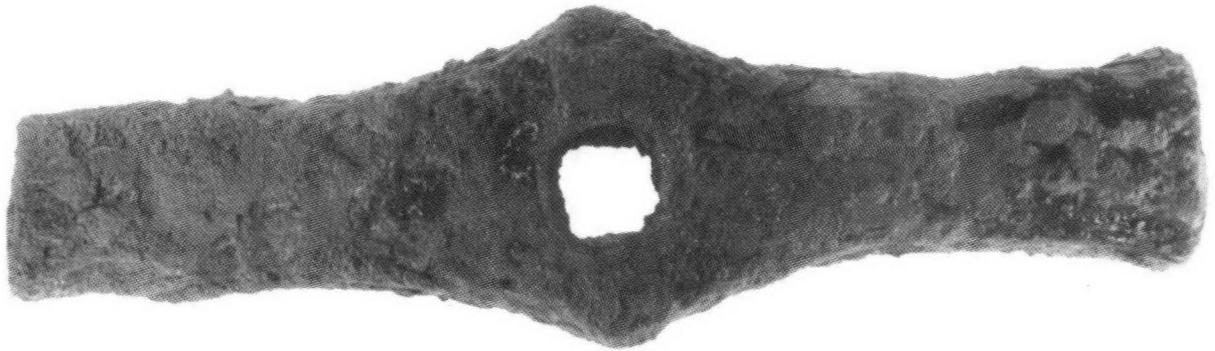


PLATE XXI. Ironwork No. 109.

Dolabra

109. 53\2354 (608). Length 290 mm. *Dolabra*. Almost complete example of *dolabra* head with both ends burred by use.

The *dolabra* or military trenching tool is most often found on military sites of the first and second centuries and probably derives from agricultural implements of the Mediterranean (Manning 1970, 19; White 1967, 43ff.). (PLS XXI-XXII).

Miscellaneous and incerta

Sheet metal

Undiagnostic fragments of plate or sheet metal, many of which may originally have formed parts of larger objects which cannot now be identified, number *c.* 25 pieces of all shapes and sizes, a few of them pierced to take rivets; in one example (69, 330 (170)) two bronze studs or rivets survive *in situ*.

Bar fragments

This group of *c.* 16 fragments are essentially the unidentified remains of artefacts with no surviving characteristics apart from length and a square- or rectangular-section.



PLATE XXII. Ironwork No. 109 side view.

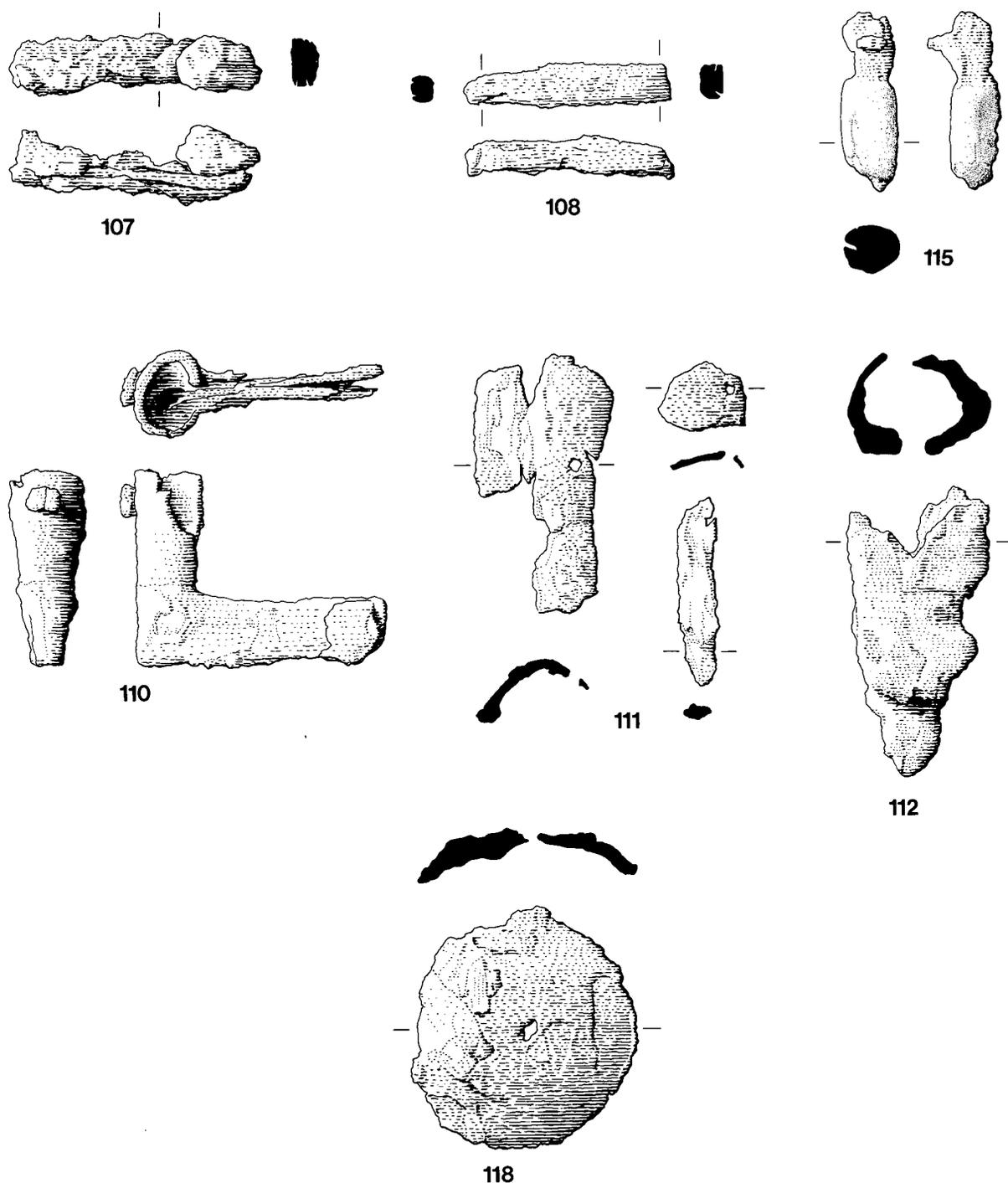


FIG. 104. Ironwork Nos 107, 108, 110–112, 115, 118 (1:2).

Tubing

Three fragments of tubing were recovered, one made from rolled sheet; the diam. of two examples was 12 mm and 25 mm.

Socketed objects

Parts of four socketed objects of uncertain function were recovered; three are reported here.

110. 53\1009 (408). Angled object, one broken arm was flattened whilst the other is socketed and has the remains of a rivet still located towards the mouth of the socket.

111. 63\1020 (647). Rivetted tool socket.
 112. 53\3126 (708). Length 75 mm, socket diam. 24 mm. Large socketed object of unknown use.

Miscellaneous rings and chainwork

Fifteen rings or fragments of chains were recovered which had no certain function, two items are described here (see Nos 2, 8 & 9 above for items with more certain function).

113. 53\3390 (788). Length 36 mm, section *c.* 3 by 3 mm. Ring fragment with square-section. (Not illustrated)
 114. 53\3390 (878). Diam. 55 mm, section *c.* 4 mm. Ring distorted and broken in antiquity. Possibly a ring handle, once circular with sub-circular section. (Not illustrated)

Incerta

115. 55\012 (032). Length of tube 51 mm, diam. of nail 12 mm. Possible plug, formed by driving a nail into a lead tube.
 116. 69\056 (091). Length 50 mm, diam. 7 mm, section 5 by 5 mm. Object comprising a circular shank with square-sectioned end. Possibly part of a larger unidentifiable object. Coiled flat-sectioned wire is present around the upper shank. (Not illustrated)
 117. 57\088 (103). Length 125 mm. Barbed object with possible tapering tang. The barbed end has a flat section. (Not illustrated)
 118. 53\988 (355). Circular hub or boss with wood adhering. Possibly a vessel.

AN INLAID PLATE FROM A FIRST-CENTURY DAGGER SHEATH By I. R. Scott

1. 57, 050 (037). Length 215 mm. Inlaid dagger-sheath plate of Type B, with a slightly irregular outline. In particular the lower end curves slightly to one side, and is cracked. There are traces of the rivet-holes to secure three of the four suspension rings. The fixing points for the upper rings are incomplete – one has no surviving holes, the second only three holes – but those for the lower rings are more or less complete with four rivet-holes each.

The decoration is divided into four vestigial zones, which are separated from one another by gaps. The first zone is a trapezoid delineated by a broad band of inlay. Within it is a V-shape formed by two parallel bands of inlay, and within the 'V' there is a smaller inverted 'V'. The whole is flanked by a field of fine herring-bone hatching. The second zone contains a cross formed by two pairs of parallel lines of broad inlay. This is on a background of fine cross-hatching. The third zone contains an inverted 'Y' or 'V' similar to that in the first zone. It is flanked by a background of herring-bone hatching. The fourth zone is decorated with panels of fine diagonal hatching.

This is a decorated plate, which was intended to be fixed to the front of a wood and leather dagger sheath (Scott in Manning 1985, 154–5; and Scott 1985, 165). The decoration is best viewed on the X-ray plates, where the fine details of the lines cut for the inlay can be discerned. It is clear that the thicker lines were cut first, as might be expected, in order to define the fields. The fine hatching was then cut in. Where the fine lines are cut from the broad lines the latter appear to be feathered.

This plate belongs to a small group distinguished by their decoration of abstract patterns formed from lines of inlay and panels of fine inlaid hatching. In Britain, other examples have been found at Neath (Scott 1992), and in excavations at Chester (3 examples: Grovesnor Museum, unpublished).⁷ On the continent examples come from Vindonissa (2 examples: Ulbert 1962, nos 6 & 7, abb. 6 & 7), and Le Rondet im Grosse Moos (Schwab 1973, 339, pl. 68), both sites in Switzerland.

The datable examples from this group are from Flavian contexts, and in some cases from sites first occupied towards the end of the first century. There is little doubt that

these plates are amongst the last examples of inlaid military dagger sheaths to be made or used (Scott 1985, 173).

The decoration of abstract patterns of inlay contrasts with the recognisable motifs found on the majority of first-century dagger plates. In addition to the plates with purely abstract designs noted above there are plates with decoration which is predominantly formed of abstract patterns, but which also incorporates stylised motifs. The motifs used are recognisable abstractions from the repertoire found on earlier sheaths. There are four such plates, from Zammerdam (Haalebos 1981, 113–15, fig. 2), Vindonissa (Ulbert 1962, no. 5, abb. 5), Chester (Grosvenor Museum, unpublished) and Gloucester (Hassall & Rhodes 1975, 79, pl. viC). The motifs present include stylised pedimented buildings or temples and stylised plants. On present evidence these sheaths are contemporary with those discussed above (Scott 1985, 173, abb. 2, nos 58–64).

It quickly becomes apparent when one studies both of these groups of sheath plates that neither group could have been made all by the same hand, or even in the same workshop. This is scarcely to be wondered at when we reflect on their wide geographical spread from the north of England to Switzerland. However, it is at least arguable that the two groups were made within the same traditions. The contrast with some of the earlier groups of dagger sheaths, and in particular the inlaid sheaths of Type A, is marked. In the first place, early sheaths have much more sophisticated and complex decorative schemes, and in the second place the workmanship they display is more skilful and more uniform. Indeed, in the case of certain groups of daggers and sheaths, it could be argued that they were the products of a single workshop (Scott 1985, 168–73).⁸

I have argued elsewhere that the changes in the methods of manufacture, and the deterioration in quality and uniformity of workmanship, reflect a change in the place of manufacture (Scott 1985, 175–9). Whether this is a transference of manufacture from workshops at the heart of the Empire, in particular in North Italy, to workshops in the provinces, or alternatively a transfer of fabrication from specialist civilian smiths to army artificers is an arguable point. I have previously argued for the latter interpretation. In support of my argument, I would say here merely that there is no evidence that provincial smiths had anything to learn from Italian smiths in the matter of metalworking skills. They may have picked up motifs and new decorative schemes, but not better techniques and improved skills.

OBJECTS OF LEAD (FIGS. 105–107) By D. R. Evans

Introduction

The collection of objects reported here mainly reflects the properties of the metal from which they are also formed, its density, malleability, and low melting point. This latter factor also reflects the size of the objects recovered, it is only rarely that some of the larger objects produced in lead survive (for example Ling & Ling 1979, 27, pl. 3 no. 16) and these tend to survive in exceptional circumstances (for example in the Corbridge 'hoard', Allason-Jones & Bishop 1988, 79, fig. 98 no. 265). The vast majority of the lead will have been recycled and examples of such recycling are quite common, as for example at Usk (Evans & Metcalf 1989, 66 and No. 36 below). Among the rather utilitarian collection the lamps or lampholders (Nos 2 & 3), the spindle whorl (No. 1), and the measure (No. 17) should be noted.

The greater part of the collection comprises waste or splash derived from ?secondary working.

Archive

The lead from the fort at Loughor comprises 285 items, of which 37 are described here. The remainder are retained as archive records only.

Catalogue

Objects associated with the manufacture and working of textiles

Spindle whorl

1. 60\001 (002). Diam. 24 mm, height *c.* 14 mm, max. diam. of cast-in hole 10 mm. A cast, truncated, bi-conical object. It is somewhat asymmetrical with a large cast-in hole. Both faces have a slightly raised design, on one a five-pointed star is clearly visible, on the other the marking is less certain, but there are four clear triangles and other lines which may make a fifth.

There is a fairly close parallel from Ewenny, Mid-Glamorgan (ex inf. S. H. Sell), although smaller it shows signs of a radiating 'V' pattern. A stone object with a herring-bone pattern from Walesland Rath, Dyfed (Wainwright 1971, 92 no. 59) is a fairly close parallel. Although the Ewenny example is associated with fifteenth-century material, neither of these parallels is closely datable, which creates a problem when looking at other apparently related items. The British Museum catalogue (1951) describes them as being a characteristic Romano-British type, but there are also a number of examples which can be certainly dated to the Medieval period; for instance an object from Austin Friars, Leicester which was still attached to its spindle can be dated to the period A.D. 1475–1538 (Mellor & Pearce 1981, 139 fig. 51.71).⁹ Unfortunately the context of the present example gives no help in solving the problem of date.

Household utensils

Lamps or lampholders

2. 55\063 (067). A poorly finished, cast example with an incomplete sub-circular handle. There can be little doubt that this example is a lamp rather than a lampholder, not only on the grounds of size (cf. Frere 1972, fig. 142, no. 1) or the width of the nozzle (Adkins & Adkins 1983) but also because it would make a perfect match for the bronze hinged lamp-cover from Oberstimm (Schonberger 1968, taf. Z9 B420). 'Open' lamps (Loeschke 1919, Type XI), often ceramic (Cunliffe 1968, pl. 51 no. 250), are not uncommon on Roman sites. Lead examples of lamps and lampholders are also known from a number of sites in South Wales as for example Roman Gates, Caerleon (Evans 1992, 175–6, nos 1–5).
3. 55\242 (161). This object was probably originally similar to No. 2; it does not have a handle, the nozzle end has been hammered flat and a section removed with clippers or a chisel.

Objects used for recreational purposes

Counters\gaming-pieces

4. 55\140 (109). Max diam. 14 mm, thickness 6 mm. Roughly circular object; the edge has a faceted appearance, perhaps as a result of filing to shape, and both faces are slightly countersunk.
5. 55\242 (162). Diam. 12 mm, height 10 mm. Asymmetrical but roughly conical object, possibly a gaming-piece.
6. 57\382 (279). Diam. 20 mm, thickness 4 mm. Cast disc-shaped object; the edge of one face is slightly sunk below the general level. Perhaps intended as a plug though it could have been used as a gaming-piece\counter.
7. 53\566 (191). Max. diam. 23 mm, height *c.* 7 mm. Roughly cast counter or gaming-piece of plano-convex shape. This piece is so similar to items made from glass and found on a

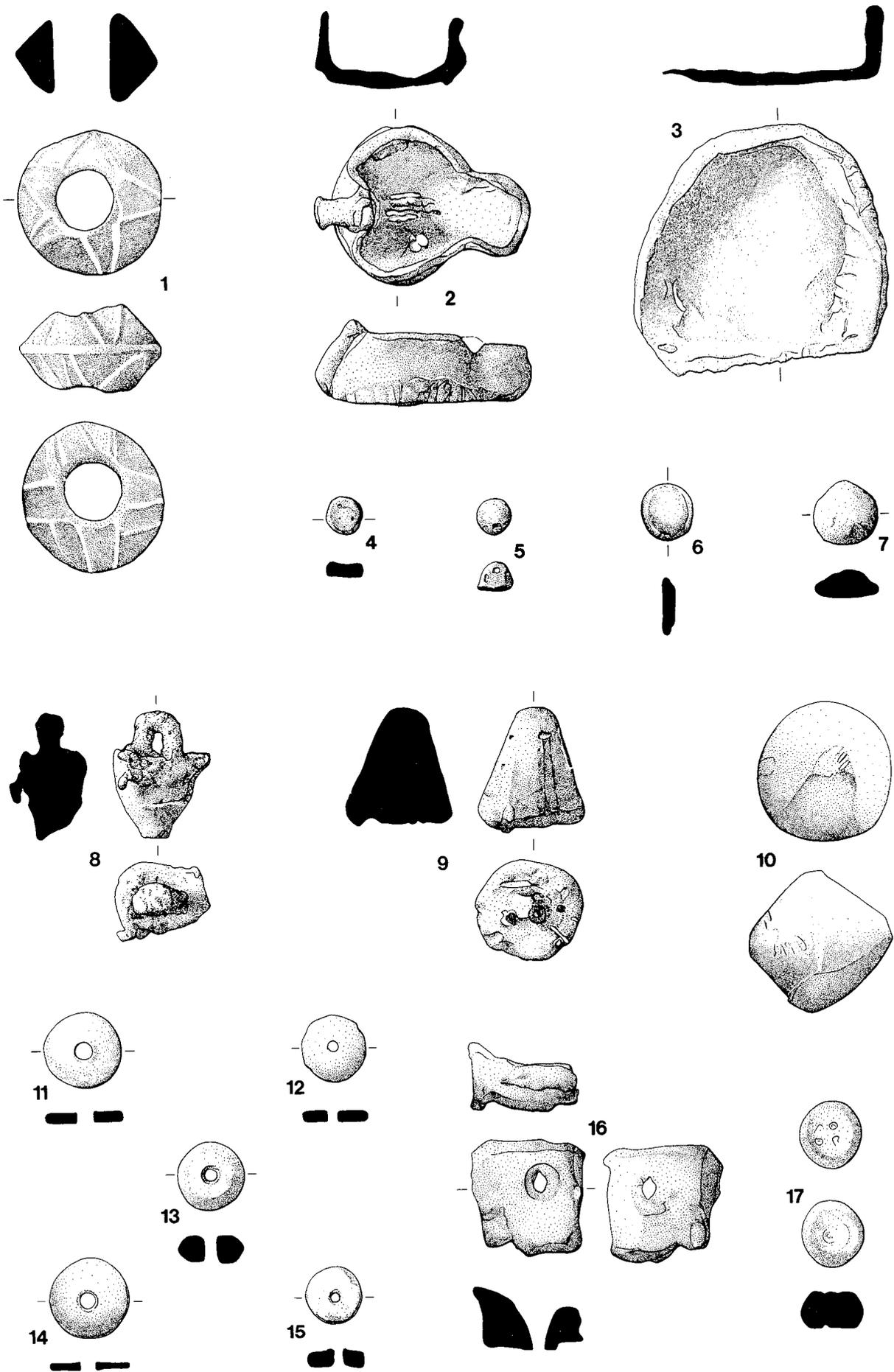


FIG. 105. Objects of lead. Nos 1 (1:1), 2-17 (1:2).

number of sites e.g. Whitton (Jarrett & Wrathmell 1981, fig. 66 nos 38–41) that there is little doubt that this lead object is intended for similar use. Glass gaming-pieces are often found in sets (Pirling 1964, 93–4 fig. 25) where their function cannot be doubted, but this does not restrict their double use as counters.

Objects employed in weighing and measuring

Weights

Plumbobs

8. 54\030 (017). Roughly pyramidal in shape, the object was cast round a loop of iron which remains. There may be the remains of a casting sprue.
9. 53\US (026). Roughly conical, cast and then hammered. The broken iron loop was added as a separate operation.

Unperforated weight

10. 69\059 (046). A cast and partially hammered object formed into a rough double cone. Weight 475g. There is a similar though larger object from Caerleon (Evans 1992, 177, no. 19). The exact function of this object is difficult to determine; it is formed so that it will not stand upright and there is no method of suspension. It may perhaps have been intended for a steelyard which had a pan (for steelyards see Barford *et al.* 1984).

Perforated weights

11. 55\171 (141). Diam. 25 mm, thickness 4 mm hole diam. 5 mm. Roughly symmetrical disc cut from sheet perhaps using a punch, and probably filed to shape.
12. 55\154 (130). Diam. 23 mm, thickness 4 mm, hole diam. 4 mm. Similar to No. 11 above but more symmetrical, with a drilled hole.
13. 55\011 (033). Diam. *c.* 24 mm, thickness 8 mm, hole diam. 5 mm. Cheese-shaped, cast.
14. 69\017 (010). Diam. 28 mm, thickness 2 mm, hole diam. 5 mm. Similar to No. 11 above but more symmetrical, with a central, punched hole.
15. 53\2491 (634). Diam. 20 mm, max. thickness 6 mm, hole diam. narrows from 5 mm to 3 mm. Cast and filed disc with one slightly convex face. It has a countersunk, drilled hole, slightly off-centre.

Objects 11–15 are of a type which are usually described as spindle whorls but their relatively common appearance on military sites may mean that they had other functions concerned with suspension, rather than with the primary production of thread.

16. 69\017 (009). Max. dimensions 38 by 36 by 15 mm, hole narrows from 15 mm to 8 mm. Lump which has been hammered into a rough cube with a hole near one corner drilled from one side and finished from the other with a punch. Probably intended as a line or fishing-net sinker.

Measure

17. 69\071 (057). Cheese-shaped object. Unlike Objects 6–12 where, whatever their function, mass was the most important factor, there can be little doubt that this item was intended as a unit of magnitude. It weighs approximately 50 g which is close to two Roman ounces *sextans* (53.76 g). One face has two (?three) spots and the other has a single indentation.

There is a similar example from Silchester (Boon 1974, 292) and from Caersws *vicus* (Arnold & Owen 1989, no. 10), a site which produced a number of examples.

There are many still unsolved problems with ancient measures which often vary considerably from exact divisions (see Arnold & Owen, for discussion and references).

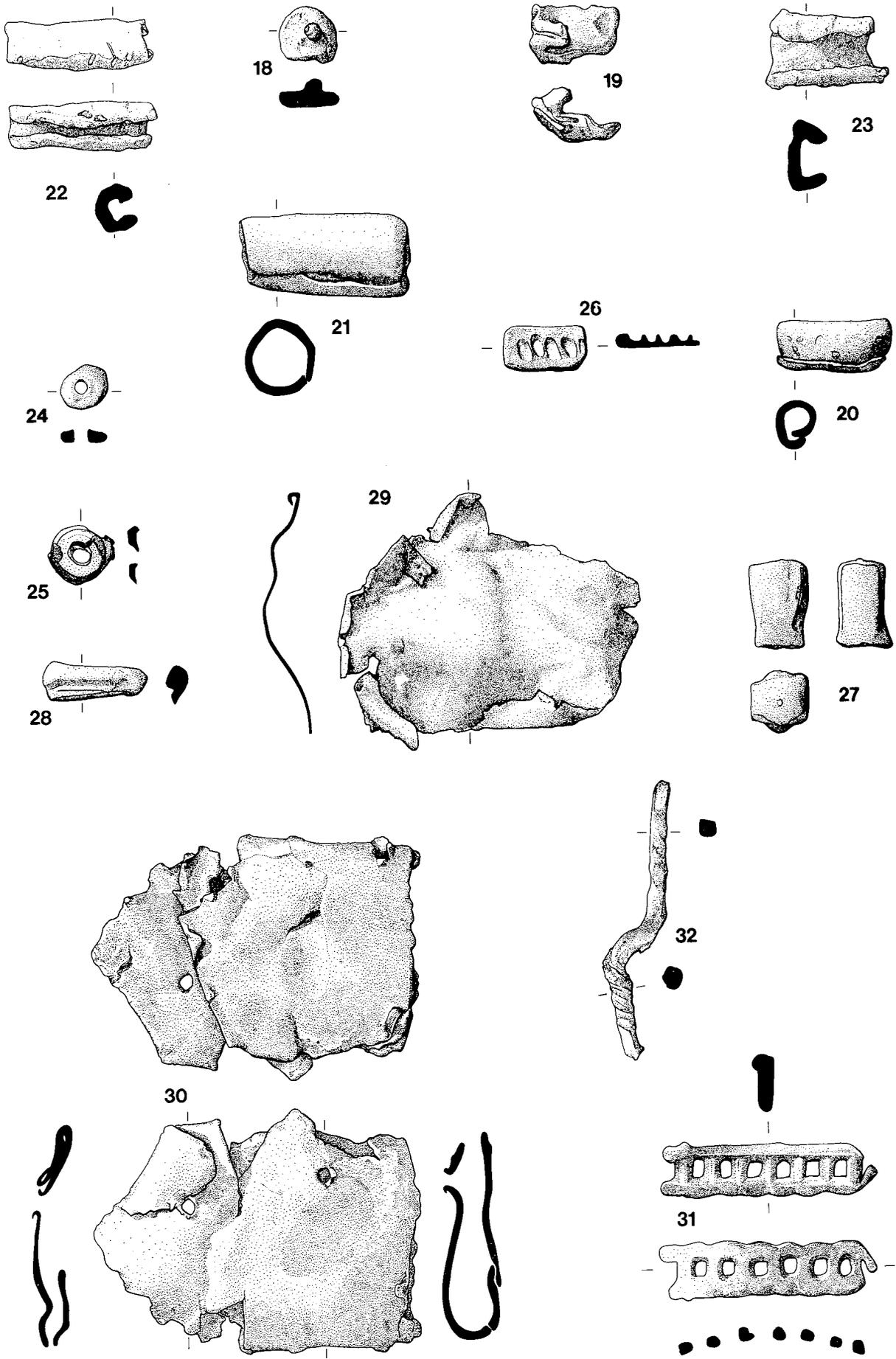


FIG. 106. Objects of lead. Nos 18-30 (1:2), 31 (1:1), 32 (1:2).

This would have been of more importance if these items were for use in commercial activity, but if they were used for instance for measuring, say, crucible charges, as has been claimed at Nanstallon (Fox & Ravenhill 1972, 94, no. 6), exact quantity may not be quite as crucial.

Objects associated with trade and communication

Seal

18. 57\048 (131). Plain seal.

Seals probably attached to a variety of materials are common on Roman sites. There are a number of examples from South Shields some of which are similar to the present example (Allason-Jones & Milet 1984, nos 8.29–8.33). Such seals cover the whole of the Roman period and they are often impressed with a variety of designs some of which show military or imperial involvement.

Fasteners and fittings

Clamp

19. 69\226 (241). A broken clamp for holding together two parts of a vessel. It is formed from a sheet rather than wire which has been hammered then melted. The rivet is larger than many examples (e.g. Brodribb *et al.* 1968, fig. 32 nos 2 & 4; Allason-Jones & Milet 1984, 8.74 & 8.99) so that it may have been for a metal vessel rather than a ceramic one, although a large mortarium might have needed such a clamp.

A study of riveted vessels from London shows that riveting was carried out when a vessel could be repaired rather than as a result of any scarcity (Marsh 1981, 227).

Pipes\channels

20. 55\002 (014). Length 40 mm, dimensions of bore 8 by 8 mm. Pipe formed from folded and then welded sheet. The bore is square. This item is probably an offcut from pipe manufacture but it may have been intended as a ferrule.
21. 69\056 (087). Length 60 mm, diam. of bore 15–20 mm. Pipe formed from thick sheet, which was roughly butted and then welded. It is certainly an offcut but secondary use cannot be ruled out.
22. 55\038 (043). Length 50 mm, dimensions of bore 8 by 8 mm. Partly formed ?pipe, the bore is similar to No. 19, except that one side appears to have been chiselled away and the object used as a channel.
23. 57\015 (059). Length 40 mm, thickness 5 mm. Broken channel with rectangular-section. It may be a partially formed (?damaged) pipe, but channel or spout are possible alternatives.

Washers

24. 55\149 (120). Max. dimensions 17 by 14 by 3 mm, diam. of hole 5 mm. An asymmetrical ?splash with hole drilled through the object for use either as a washer or a spacer.
25. 53\376 (222). Diam. 20 mm, thickness 3 mm, diam. of hole 5–8 mm. Circular object roughly clipped from thick sheet. A crude hole roughly countersunk has been punched from one side.

Objects and waste material associated with metal working

Sixty-nine fragments derived from ?secondary working were recovered. The minimum weight of these is 617 g.

Miscellaneous

26. 55\140 (108). Max. dimensions 30 by 15 mm, thickness 4 mm. A broken rectangle of sheet filed to shape. One face has four complete and one broken axe-shaped depressions. Possibly a die resulting from the impressing of a punch into a copper-alloy object (for the use of lead blocks in the working of sheet metal see Lang & Holmes 1983).
27. 69\005 (029). Max. dimensions 20 by 15 by 30 mm. Weight *c.* 95 g. A roughly cheese-wedge-shaped object, the sharp end of which has been hammered flat. Function unknown but it may be a small example of a wedge used to hold an iron tie (see Zienkiewicz 1986, 323).
28. 69\003 (005). Length *c.* 35 mm. A clipped piece, which has a bead-shaped profile. It may be pewter rather than pure lead and is probably part of the rim of a vessel. Possibly but not certainly post-Medieval.
29. 54\150 (023). Max. dimensions 100 by 80 mm, size of hole 4 by 4 mm. Roughly rectangular piece of thin sheet, now damaged, with one certain and one possible, square-shanked nail-hole. Probably a repair patch.
30. 54\056 (020). Dimensions of nail-holes 4 by 4 mm, dimension of other hole 10 by 10 mm. Roughly rectangular piece with a triangular extension. It has been formed from a thin sheet which has been hammered over itself. It is now bent double but was originally flat or more probably formed a right-angle. There are four irregularly spaced square-section holes punched through from the inside and, in the angle, is a larger, rectangular hole. A repair patch for the inside of a box or tank.
31. 57\028 (060). Length *c.* 40 mm, width 8 mm, dimensions of nail-holes 4 by 4 mm. A broken ladder-shaped object. It has a slight curve which appears to be original and one edge has a slight flange. The series of square holes which form the ladder which were cast into the original, has been expanded by the use of square-shanked nails or tacks. This object was probably used as a spacer on some object which was covered with sheet and decorated with nails. There is a similar object from Caerleon (Evans 1990, 178, no. 35).
32. 57\416 (261). Size of section 4 by 4mm. A broken length of originally square-section bar. It has been bent into a Z-shape and one end has been twisted giving it a screw-thread appearance; the other end shows the marks of pliers where the object has been bent to join some other material, perhaps wood. Probably a building fitting.
33. 57\085 (152). Length 70 mm, size of section 20 by 20 mm. Semicircular cast bar, possibly a small ingot.
34. 53\1002 (395). Length 36 mm, max. diam. 10 mm. Cast and hammered pipe. The tube has been hammered closed at both ends and at one end it has been penetrated by a small hole possibly for a nail. Function unknown.
35. 53\3306 (677). Max. outer diam. 26 mm, max. inner diam. 16 mm, thickness *c.* 2 mm. Penannular, asymmetrical object, very roughly made; it appears to have been deliberately fashioned, perhaps as some form of washer or spacer.

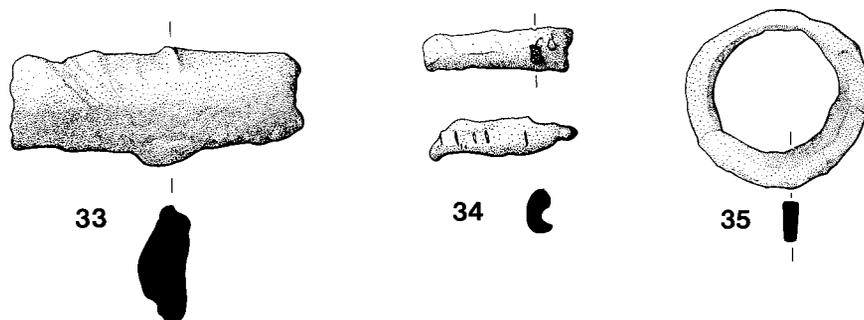


FIG. 107. Objects of lead. Nos 33, 34 (1:2), 35 (1:1).

36. 53\3167. A partly fused pile of offcuts of sheet, weight *c.* 670 g (*c.* 2 *libra*) probably a crucible charge, indicating lead-working on site. (Not illustrated)
37. 53\3476 (676). Max. dimensions 24 by 20 by 2 mm; dimensions of expansion *c.* 10 by 12 by 2 mm. Cast then hammered ovoid plate with a sub-rectangular expansion on the inner side formed when hammered into another object to form a plug or seal. (Not illustrated)

THE POTTERY AND CERAMIC LAMPS

THE SAMIAN (FIGS 108–111) By B. Dickinson

Introduction

All of the sites excavated at Loughor between 1982 and 1988 produced samian. Four of these, 53, 55, 57 and 69, yielded substantial quantities, while the amounts from Sites 54 and 66 were much smaller. The pattern which emerges from these areas is remarkably consistent, and is paralleled in other Welsh forts, such as Gelligaer.

The emphasis is overwhelmingly on the first century, and particularly on the Flavian period. There is little pre-Flavian or Neronian-Flavian material and the proportion of decorated bowls of Form 29, which was beginning to decline in popularity by 80, is high enough to suggest that the fort was founded in the mid-70s.

The quantities of late first- and early second-century material are considerably lower. This may be related to the history of the site, but could equally well be explained by changes in the availability of samian, which are reflected elsewhere in Britain at this time.

Sites 53 and 54 both produced single sherds of Hadrianic date, but otherwise nothing later than the Trajanic period. Site 66 produced one Hadrianic or early Antonine piece. The samian from Sites 55, 57, and 69 goes down at least to 160, but the quantities of Antonine material are generally small, with the exception of Site 69, where they are slightly higher. There is nothing necessarily later than 165–170. The complete absence of East Gaulish ware, which was coming into Britain at this time, is noticeable.

Archive

All of the Potter's Stamps found at Loughor are reported here; the full Samian report is retained in the archive with selected pieces published here.

Abbreviations

The following abbreviated bibliographic references are used:

D – Déchelette, J., *Les Vases céramiques ornés de la Gaule Romaine* (1904, Paris).

O – Figure-Type in Oswald, F., *Index of Figure-types on Terra Sigillata ('Samian Ware')* (1936/7, Liverpool).

Rogers – Motif in Rogers, G. B., *Poteries sigillées de la Gaule Centrale*, Gallia Suppl. 28 (1974).

S & S – Stanfield, J. A., and Simpson, G., *Central Gaulish Potters* (1958, London).

The Potters' Stamps

Each entry gives: excavation, context, (individual find number), potter (i, ii etc., where homonyms are involved), die number, form of vessel, reading, pottery of origin.

Ligatured letters are underlined.

(a), (b) and (c) indicate:

(a) A stamp attested at the pottery in question.

(b) Not attested at the pottery in question, though the potter is known to have worked there.

(c) Assigned to the pottery on the evidence of, fabric distribution, etc.

1. 55\001 (029) Ovidius 1a 33 OVIDIM Les-Martres-de-Veyre (a).
The fabric of this piece and the occurrence of the stamp in the London Second Fire group suggest a date. *c.* 100–125.
2. 55\096 (092); 57, 142 (172) Vitalis ii 6d 15/17 or 18 (2) OFVITAL; OFV[La Graufesenque (a).
One of Vitalis ii's commonest stamps, with many examples from Flavian foundations, including Chester (3), Malton and Newstead. *c.* 75–100.
3. 55\183 (159) Vitalis ii 8n 27 g OFVITA La Graufesenque (b).
This stamp occurs in the pre-Flavian cemeteries at Nijmegen, but also at the Ulpia Noviomagus site there. *c.* 65–90.
4. 55\191 (150) Manduilus 6a 15/17 or 18 MANDVILMA La Graufesenque (a).
This stamp is commonest on bowls of Form 29 of the late Neronian and early Flavian periods, with examples from Baginton, Chester, Nanstallon, and the Pompeii Hoard. *c.* 65–85.
5. 55\242 (167) Iullinus i 2a 15/17 or 18 [I]VLLI[NI·M] La Graufesenque (b).
Iullinus i was at work in the 60s, as attested by a stamp in the Burghöfe Geschirrdepot of 69, but his wares also turn up in the Inchtuthil gutter and at the main site in Corbridge. This particular stamp is known from Carlisle and the Nijmegen fortress. *c.* 65–95.
6. 55\300 (209) Albanus ii 1b 27g OFALBANI La Graufesenque (1).
This stamp comes from a die which was in use in the Neronian and early Flavian periods. A swallow-tail was cut in the end of the frame before *c.* 70, as evidenced by stamps from this modified die in the pre-Flavian cemeteries at Nijmegen. A few stamps from the original die occur at Flavian foundations, but are much less common than those from the modified die. The dates for the two versions are likely to be *c.* 60–70 for 1b and 65–90 for the modified die (1b').
7. 55\310 (223) Primus iii 3a 29 OFIC·PRIMI La Graufesenque (a).
Die 3a, and a broken version of it, were both used on Form 29. The bowls stamped with the broken die appear to be early Flavian, which suggests a date *c.* 60–70 for the original version.
8. 69\017 (012) & 69, 053 (126), joining, Mammius 2a 33 MAMM[·OF] Lezoux (b).
This stamp is not likely to have been in use before *c.* 160, to judge by its frequent occurrence on Hadrian's Wall and at hinterland forts reoccupied about this time. Mammius used other stamps on Form 27, which should be earlier. His range is therefore *c.* 150–180, with 160–180 for Die 2a. (Not illustrated)
9. 69\020 (072) Sacero 1a 30 or 37 rim [SA]CERO[M] Lezoux (c).
An early to mid-Antonine stamp, used on Forms 18/31R, 27, and 31R, but also on the rim of a decorated bowl in the style of either Albusius ii or Paternus v (S & S, pl. 166, 10). *c.* 145–175.
10. 69\047 (232) Sarrutus 1a 33 [OF·S]ARRVT La Graufesenque (a).
This stamp occurs at Risstissen (abandoned in the 70s), but also at Butzbach and the main site at Corbridge. *c.* 70–90.
11. 69\056 (105). Secundus ii 30a 29 [SE]CVND La Graufesenque (b).
Only one other example of this stamp has been noted, from Rottweil (Knorr 1907, taf. xxxi, 269). The form and fabric of the Loughor piece suggest a date *c.* 70–85.
12. 69\243 (164) Virtus i 1a 29 OFVI[RTVTIS] La Graufesenque (b).
The site record for this stamp includes Castleford, York, and Rottweil. The die was used mainly on Form 29s with early Flavian decoration. *c.* 70–85.
13. 57\006 (004) Viducus ii 4a 18/31 [VIDVC]OS·T Les-Martres-de-Veyre (a).
A stamp noted in Period IIA at Verulamium (before *c.* 110) and in the London Second Fire groups. *c.* 100–125.
14. 57\052 (071) Vaxtius 1a 27g VAXTI La Graufesenque (c).
A stamp used only on cups, mainly Form 27, but with a few examples of Form 33. It occurs at Rottweil and in the cemetery of the Nijmegen fortress. Flavian.
15. 57\080 (078) Modestus i 9a' 27 OFMO(I) La Graufesenque (a).

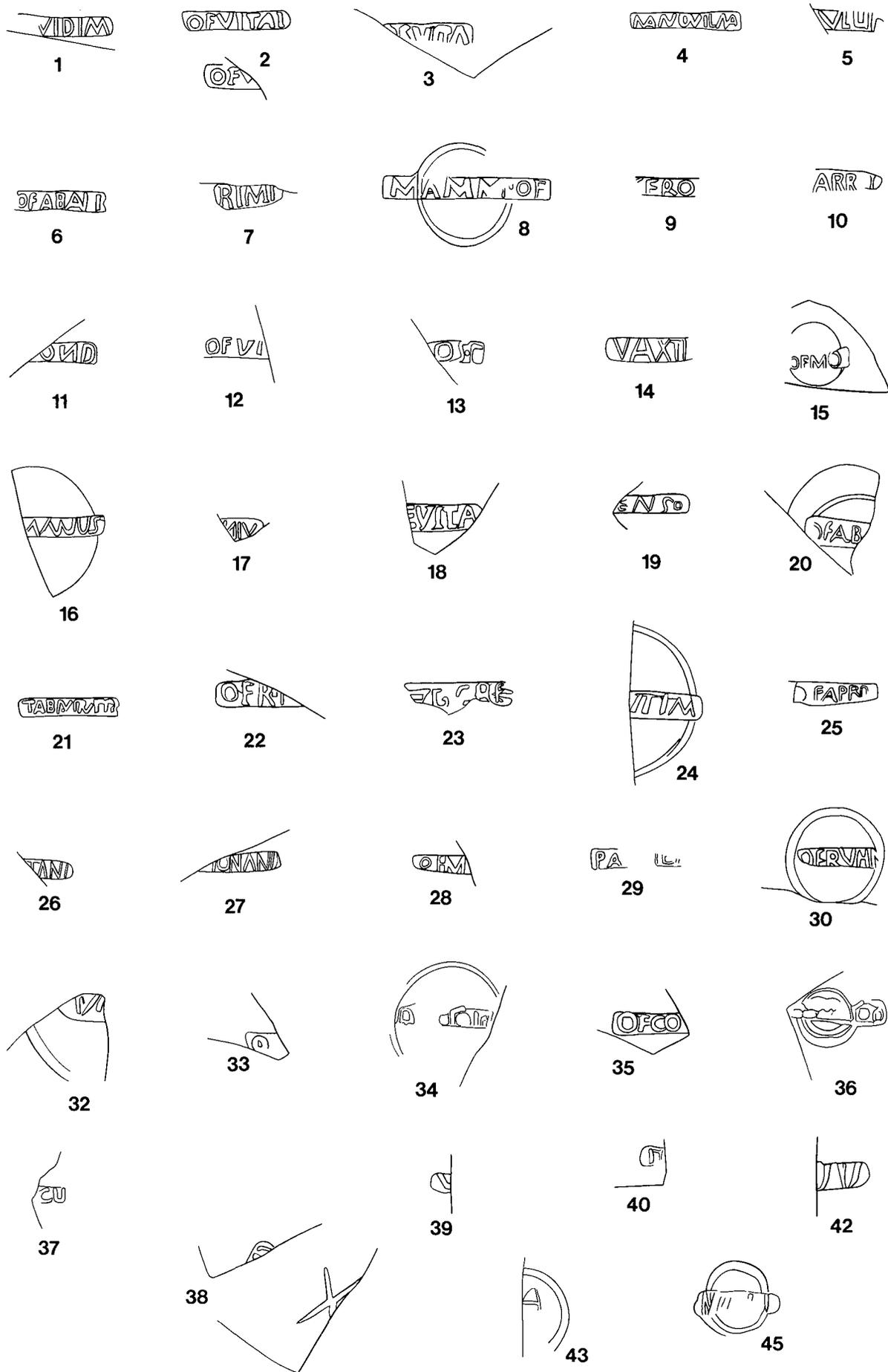


FIG. 108. Samian stamps. Nos 1-30, 32-40, 42, 43, 45 (1:1).

The die from which this stamp comes gave OFMOI and was a broken version of one which gave OFMOD, and almost certainly belonged to Modestus i. It is unlikely to have been used by Modestus himself for very long, since, although OFMOI is known on Forms 24 and Ritterling 8, most of the other vessels noted come from Flavian foundations. This is presumably an instance of a die passing from one potter to another, or continuing in use in a workshop after the potter's normal working life. *c.* 60–75.

16. 57\090 (110) Osbimanus 2a 18/31R [OSBI]MANVS Lezoux (b).
A stamp noted from Bainbridge, Catterick, and Halton Chesters and on Forms 15/31R, 18/31R, 31R, and 80. This suggests a range *c.* 150–180 for the die, with 150–165 for its use on Form 18/31R.
17. 57\090 (111) Genialis iii 3a 27? [CE]NIA. retrograde.
This is from a die known to have been used at both Les Martres-de-Veyre and Lezoux. The fabric of the cup suggests origin at Les Martres-de-Veyre and Trajanic date.
18. 57\184 (214) Vitalis ii 8g 15/17 or 18 [O]F.VITA La Graufesenque (b).
An uncommon stamp, noted from the Saalburg. *c.* 70–100.
19. 57\311 (231) Censor i 1a 15/17 Or 18 [OF]CENSO La Graufesenque (b).
A stamp from one of this potter's earlier dies, to judge by an example from Rheingönheim, which was abandoned by *c.*75. *c.* 65–85.
20. 57\311 (247) Albanus ii 1b' or 1b' 27g OFALB[La Graufesenque (b).
For a discussion of Dies 1b and 1b' see No. 6. above.
21. 57, 445 (275) Tabus-Virtus 1a 15/17 or 18 TABIVRTVTI§ La Graufesenque (a).
Examples of this stamp occur at sites founded under Domitian including Wilderspool, Butzbach, and the Saalburg (3), but there is also said to be one on Form 29 (Royal Ontario Museum, pers. comm. Mrs A. Easson). *c.* 75–100.
22. 53\001 (006) Frontinus 14a 18 OFR[NTNI] La Graufesenque (b).
A stamp used only on unrouletted dishes. Examples occur at Caerleon, Chester, Watercrock, and the main site at Corbridge. *c.* 75–100.
23. 53\001 (010) Crestus 3a' 18)Γ·CRE<S> La Graufesenque (b).
The die from which this broken die derives was first used in the pre-Flavian period, but the site record for the stamps is mostly Flavian, and a few examples of Form 29 have decoration typical of the period *c.* 70–85. A stamp from the broken die occurs at Binchester. The range for both versions will be *c.* 65–95 and 3a' will have been in use *c.* 80–95.
24. 53\584 (215) Carantus i 5a 15/17R or 18R [CARAN]TIM La Graufesenque (a).
Carantus i's wares are not uncommon at Flavian foundations. Stamps from this particular die turn up at Caerleon, Catterick, and Heidelberg-Neuenheim and there are a few stamps from other dies at Butzbach. *c.* 75–100.
25. 53\939 (334) Aper i 5a 27g OF.APR(I) La Graufesenque (a).
Aper i's activity seems to have been entirely pre-Flavian. His output includes Forms 24 and Ritterling 8 and one of his stamps occurs in a group of samian of *c.* 55–65 from a wreck off Cap Dramont, in southern France. *c.* 50–65.
- 26–8. 53\1090 (420); 55, 064 (084); 55, 276 (199) Montanus i 1a 15/17 or 18 (2); 18 [OFMON]TANI;]ONTAI; OFM[La Graufesenque (b).
One of Montanus i's later stamps, noted from sites such as Caerleon and Inchtuthil (from the Gutter find). There are no examples from pre-Flavian contexts, though one of his other stamps occurs on Form Ritterling 8 and another in one of the Colchester pottery shops destroyed *c.* 60/61. *c.* 70–90.
29. 53\1688 (514) Pass(i)enus 61a 27? PASSIE‡ La Graufesenque (b).
This potter's output is mainly Neronian, but a few of his stamps occur at Flavian foundations. This particular one is noted from Chester, the Nijmegen fortress, and the Gloucester fortress and *colonia* site. *c.* 60–75.
30. 53\1956 (547) Rufinus iii 4c or c' 27g OFRVFIN or OFRVFIA La Graufesenque (a).
This is probably from the earlier version of the die, but the circle on the base cuts through the end of the N. Both stamps are common in Flavian contexts and there are several from 4c' in Wales, at sites such as Caerleon, Caersws, and Caerhûn. *c.* 70–90.

31. 53\3376 (674). Logirrus 10a 15/17 or 18 LOGIRN[M].

The die for this stamp was used at both La Graufesenque and Montans. The fabric of this cup clearly belongs to the La Graufesenque range. The stamp is common in Wales, being noted from Caerleon, Caerwent, Carmarthen, Pen Llystyn, and Segontium. It was used to stamp Form 18/31R, which was made at La Graufesenque in the Flavian-Trajanic period, and a cup of Form 33 which looks to be of the same date. There is a graffito XIIV[inscribed under the base after the firing. *c.* 80–100. (Not illustrated)

Unidentified

32. 55\082 (303) VI[or JIA on Form 29, South Gaulish. *c.* 70–85.
 33. 55\115 (283) JIO? on Form 15/17 or 18, South Gaulish.
 34. 55\179 (186) JOI[? on Form 29, South Gaulish. *c.* 70–85.
 35. 69\347 (176) OFCO[on Form 15/17 or 18, South Gaulish. Flavian.
 36. 54\005 (005). An illegible stamp on Form 27, probably from Les Martres-de-Veyre and Trajanic.
 37. 57\047 (306) JCI on Form 31, slightly burnt, Central Gaulish. Antonine.
 38. 57\088 (098) JCI or JSI on Form 18, South Gaulish. A graffito]X[is inscribed under the base after firing. Flavian.
 39. 57\177 (304)]symbol on Form 18, South Gaulish. Flavian.
 40. 57\245 (305) JRI? on Form 15/17 or 18, South Gaulish. Flavian.
 41. 53\601 (428)]symbol on Form 27g South Gaulish. Flavian. (Not illustrated)
 42. 53\815 (303) JIV on Form 18 South Gaulish. Almost certainly illiterate. Flavian.
 43. 53\1021 (471)Λ [or JV on Form 27g, South Gaulish. Early Flavian.
 44. 53\1943 (541) /[or]/ on Form 27, from Les Martres-de-Veyre. Trajanic. (Not illustrated)
 45. 53\2035 (586) I . . . I on Form 27g, South Gaulish. Flavian.

Catalogue

Note: Unless otherwise stated all the material is South Gaulish and of Flavian-Trajanic date.

Site 55

Phase 2

Stamp No. 7.

1. 310, Form 29 (with sherds in 179, 300, and 57/165). Stamped OFIC.PRIMI (Stamp No. 7). The lower concavities of the scroll in the lower zone are rather unusually arranged, with chevron festoons infilled with rows of pointed leaf-tips, below (alternating?) Cupids (Hermet 1934, pl. 18, 36) and hares (Hermet 1934, pl. 26, 66 or similar), with wavy line between. The upper concavities contain two sizes of fan-shaped leaf, a bud, and a spindle. An unstamped Form 37 from Fishbourne (Period 1B–C, before 75: Dannel 1971, no. 20) and Form 29 from Lisieux, with a basal stamp of Severus ii, have similarly arranged zones. The larger fan-shaped leaf (Hermet 1934, pl. 7, 21) is on Form 29 from York. The laying out of the scroll is very uneven. *c.* 60–75.

Phase 3

2. 455, Form 29. A panel in the upper zone includes diagonal wavy lines and rows of pointed leaf-tips. *c.* 70–85. (Not illustrated)

Phase 4

3. 290, Form 29. The straight gadroons in the lower zone suggest a date *c.* 60–75. (Not illustrated)

4. 302, Form 29. The scroll in the lower zone includes tulip-leaves. *c.* 70–85. (Not illustrated)

Phase 5

Stamps Nos 6 and 28

5. 274, Form 15/17 or 18. A tiny graffito, VIII, was inscribed on the base after firing. Early Flavian. (Not illustrated)

Phase 6

Stamp No. 5.

Phase 7

Stamps Nos 3 and 4.

6. 123, Form 29. The panelled upper zone contains a fan-shaped plant (Hermet 1934, pl. 14, 81) over a butterfly tie, flanked by a seated hare to left and a dog to left (Hermet 1934, pl. 26, 27, or 28), over a grass blade. An adjacent panel has trifid motifs in series, impressed sideways (Knorr 1919, taf. 57, 12?). The lower zone consists of a wreath of small leaves, over a zone of triple festoons with stirrup-leaves and tassels. Many of the details were used by Mercator i and some of his associates. *c.* 70–85. (Not illustrated)
7. 255, Form 29 (burnt with adjoining sherd in 254). The upper zone consists of a straight wreath of trifid motifs, as on a bowl from Rottenburg (Knorr 1910, taf. I, 2). *c.* 70–85. (Not illustrated)

Phase 8

8. 073, Form 29. The upper zone includes a festoon containing a stirrup-leaf, in the manner of several early Flavian potters at La Graufesenque. *c.* 70–85. (Not illustrated)
9. 140, Form 37. In the style of Drusus i (X-3) of Les Martres-de-Veyre. The zonal decoration includes festoons and scrolls and his beaded rosette (Rogers C280). *c.* 100–120. (Not illustrated)
10. 175, Form 37. A central wreath of trifid motifs has a scroll above, and perhaps another below. The wreath and the tiny ring in the upper scroll are on bowls of Form 37 in the style of Calvus i. *c.* 70–90.

Phase 9

Stamps Nos 2, 32 and 33.

11. 082, Form 29 or 37. The lower zone has a wreath of S-shaped gadroons below a series of serrated leaf-tips of a type used at La Graufesenque in the 60s and 70s. This bowl presumably belongs to the 70s in view of the gadroons. (Not illustrated)
12. 083, Form 37. The ovolo, not yet recorded on stamped or signed bowls, was used in the Flavian-Trajanic period (cf. Knorr 1912, taf. xxiii, 2, from Rottweil). *c.* 90–110. (Not illustrated)
13. 115, Form 37. Panelled decoration, over a basal wreath of fan-shaped (?) plants. One panel contains figures; the adjacent panel consists of a saltire, with spindle (?) tassels in the side quadrants. The bottom quadrant contains a trifid motif (Knorr 1919, taf. 57, 12) which was used by Mercator i and some of his contemporaries. *c.* 80–110. (Not illustrated)

Phase 10

Stamp No. 27.

14. 064, Form 37. Central chevron wreaths, of the type used here to divide two zones of decoration, occur on bowls in the Pompeii hoard (Atkinson 1914, nos 49–52). *c.* 70–90. (Not illustrated)

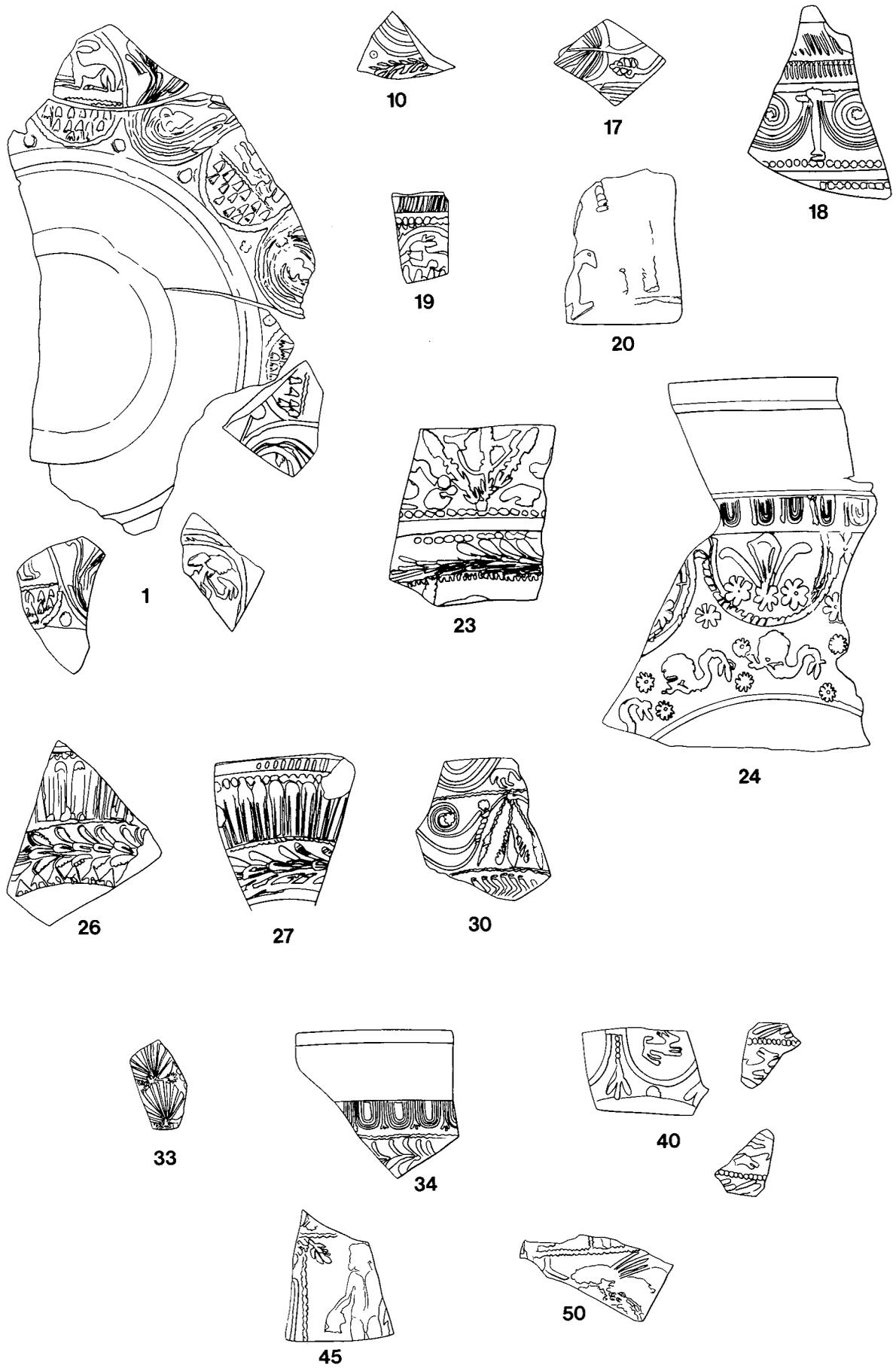


FIG. 109. Samian Nos 1, 10, 17-20, 23, 24, 26, 27, 30, 33, 34, 40, 45, 50 (1:2).

15. 104. Decorated sherd. The decoration includes a triple medallion or festoon and a striated spindle. Flavian. (Not illustrated)
16. 106, Form 29. One of the panels in the lower zone has a double row of pointed leaf-tips in its lower part. The adjacent panel contains a draped figure. The basal wreath consists of fan-shaped plants. *c.* 70–85. (Not illustrated)
17. 159, Form 30. The fragment has a scroll decoration involving a large leaf (of the general type Hermet 1934, pl. 10, C) and a small, seven-lobed leaf. *c.* 65–85.
18. 159, Form 29. The upper zone consists of double festoons, containing spirals and separated by tassels. *c.* 70–85.
19. 159, Form 29. The scroll in the upper zone includes a hare over a row of pointed leaf-tips, as on a bowl from Castleford with a mould stamp of Iustus i. *c.* 70–85.

Phase 11 (post fort abandonment)

Stamp No. 1.

20. 002, Form 37, Central Gaulish. A panelled bowl in the style of Casurius ii. For the cup and acanthus, cf. S & S, pl. 134, 24 & 28. *c.* 160–190.
21. 011, Form 37 with a vine-scroll as on bowls in the so-called Donnaucus style from Les Martres-de-Veyre, but here in Lezoux fabric (cf. S & S, pl. 49, 577). *c.* 125–140. (Not illustrated)
22. 036, Form 37, Central Gaulish. Probably by Butrio, who used the guide line in the decoration and the figure-type, a man with an amphora (D365). *c.* 125–145. (Not illustrated)
23. 036, Form 29. The unusually deep upper zone includes a fan-shaped motif of three spear-like plants (Knorr 1919, taf. 44, no. 10, of Iustus, but with an extra chevron at the bottom), with birds on tendrils between. The motif is flanked by a pair of Nile geese (Hermet 1934, pl. 28, 68). The wreath below the central cordon, consisting of four-bladed motifs, is on Form 29 from Koblenz, from a stamped mould of Severus ii, who is one of the few La Graufesenque potters known to have used bead-rows within zones on Form 29. He also used the small birds and geese on two bowls with internal stamps, both from London (Museum of London and Coll. Norris at Lewes Museum, respectively). *c.* 70/75–85.
24. 045, Form 37, Central Gaulish (with 3 sherds from 042). The ring-tongued ovolo with straight line below, the smaller rosette and the dolphin occur on a stamped bowl of Pugnus ii from Exeter, in one of his later styles. The uneven chevron festoons and the larger rosettes (Rogers C145) are on a bowl in his style from Winchester with one of his commoner ovolos. There is no exact parallel for the plant in the festoon. The bowl has been drilled for riveting. *c.* 150–180.
25. 076, Form 29 (three fragments, heavily burnt). The upper zone contains a scroll with spirals. The zone of palisades below the central cordon occurs on many early Flavian examples of Form 29 (cf. Knorr 1912, taf. vi for similar, slightly smaller palisades, on a bowl from Rottweil). *c.* 70–85. (Not illustrated)

'Cleaning contexts'\Unstratified

Stamp No. 34.

26. 072, Form 29. The lower zone consists of short, straight gadroons, a wreath of trifid motifs, and a closing row of upright arrow-heads. All the motifs are on bowls stamped by Pass(i)enus, the gadroons and arrow-heads on one from Carlisle (May & Hope 1917, pl. II, 11), the wreath on one from Regensburg. The wreath is also on Form 37s from Wanborough, Wilts., and Neuss from moulds signed, after firing, by Censor i, and the motif is on Form 29 from Vechten stamped by him (Knorr 1919, taf. 22A). *c.* 70–85.
27. 094, Form 29. The lower zone consists of straight gadroons, over a basal wreath of trifid motifs (Knorr 1919, taf. 57, 15), as used by Mercator i and some of his contemporaries. *c.* 70–85.

28. 119, Form 37. A panel with triple festoons and a corner tassel either has a double border, or is adjacent to a panel of wavy lines. *c.* 75–100. (Not illustrated).
29. 179, Form 29. A webbed leaf in the lower zone is paralleled on a bowl from Rottweil (Knorr 1912, taf. vi, 6) and, possibly, on a bowl stamped by Matugenus ii (Knorr 1919; taf. 53, 3). This zone includes another, probably trifid, motif. *c.* 60–75.
30. 179, Form 37. Zonal decoration, with a basal wreath of square-ended chevrons. The lower scroll has tightly-wound spirals in the upper concavity and a pendant trifid motif (similar to Hermet 1934, pl. 14, 36), flanked by striated spindles, in the lower concavity. The scroll is bound by spindles, but the spirals are attached by rosettes. The upper scroll contains a goose to right (Hermet 1934, pl. 28, 68). *c.* 70–90.
31. 313, Form 29. The lower zone contains a wreath of fan-shaped plants below the cordon and a single festoon in a panel, or with a tassel to the left of it. *c.* 70–85. (Not illustrated)

Site 69

Phase 2

32. 150, Form 37. The decoration includes a chevron wreath below the ovolo and a zone of festoons and tassels. *c.* 70–90. (Not illustrated)

Phase 4

33. 154, Form 29. The upper zone consists of a wreath of unusual, shell-shaped motifs, with almost vertical rows of small rosettes between them (cf. Hermet 1934, pl. 44, 22 (23) for a similar wreath). *c.* 70–85.

Phase 5

Stamp No. 35.

34. 278, Form 37. The trident-tongued ovolo has a chevron wreath below it. The ovolo is on a stamped bowl of Severus ii from Nettleton Scrubb and on several bowls with cursive signatures of Pontus. Both men used chevron wreaths, but there is no precise parallel for this one. 75–95.
35. 278, Form 37, South Gaulish (with a sherd in 001). A bowl with zonal decoration, involving chevron festoons with alternating birds to right and left, looking back (perhaps Hermet 1934, pl. 28, 39–40), and a straight, thick tassel. The basal wreath is composed of four bladed plants (smaller than Hermet 1934, pl. 14, 49. For the festoons see Knorr 1912, taf. xviii, 7–8, from Rottweil). *c.* 80–100. (Not illustrated)
36. 347, Form 37. The basal wreath consists of shell-shaped leaves, overlapping, and the zone above includes a panel with a corner-tassel and one consisting of a saltire. Probably Flavian-Trajanic. (Not illustrated)

Phase 6

37. 149, Form 37, burnt. A griffin (Hermet 1934, pl. 25, 5 or 6) and the triangle of small rings under it are closely, if not exactly paralleled on Form 29 from York with a mould-stamp of Iustus i (IIVST). *c.* 70–90. (Not illustrated)

Phase 7

Stamp No. 1.

38. 056, Form 29. The fragment has a trident-tongued ovolo used by Crucuro i, but the wreath of trifid motifs below it (Hermet 1934, pl. 14, 3, or very similar) is not attested for him. 75–100. (Not illustrated)

Phase 8

39. 304, Form 37. The fragment has a triple festoon with stirrup-leaf to right and a tassel. Cf. a bowl from Rottweil (Knorr 1912, taf. xx, 4) which may have identical decoration. 80–100. (Not illustrated)

Phase 9

40. 008, Form 29 (with probable sherds in 234 and 278). The lower zone includes a straight wreath of plants below the carination, over a dog (a tiny version of 01965). The piece from 278 shows the same wreath and that from 234 has two festoons, one with a dog, and a trifid pendant. A bowl from a mould by a potter who used beaded rather than wavy-line borders (cf. 57/180 and 311). The pendant motif is on a bowl from London (formerly Guildhall Museum) stamped by Severus ii, which also has headed borders. 70–85.

Phase 10

41. 227, Form 37, Central Gaulish. The ovolo apparently has a straight line below. A panel with a vertical series of chevrons has a beaded border. Not closely datable, but probably early second-century. (Not illustrated)
42. 321, Form 37, Central Gaulish. The ovolo was used by an early Paternus (iv) of Lezoux, who signed moulds in the nominative. A figure to the left, of which only the head survives, is not one previously known for him. His style has connections with the Sacer i group, though he is probably rather later. One of his bowls occurs in a group of early-Antonine samian from Castleford, and his range is likely to be 130–155. (Not illustrated)

Phase 11

Stamp No. 12.

43. 023, Form 37, Central Gaulish. The ovolo (Rogers B61?) was used by Attianus ii and Drusus ii. *c.* 125–145. (Not illustrated)
44. 226, Form 37. In the style of Drusus i (X-3) of Les Martres-de-Veyre. The single-bordered ovolo is Rogers B28. The zone below consists of a scroll, with astraguli in the upper concavities (Rogers U105) and anchors in the lower (Rogers G395). (Cf. S & S, pl. 14, 170 for similar decoration.) *c.* 100–120. (Not illustrated)
45. 235, Form 30. The vessel probably has a trident-tongued ovolo. One panel has a corner tassel. The adjacent panel has a Bacchus (Hermet 1934, pl. 19, 71) and a bunch of grapes in an upper corner, in the manner of L. Tr. Masc(u)lus and some of his associates. *c.* 85–110.
46. 235, Form 37 (with adjoining sherd in 243). The trident-tongued ovolo was used by Florus iv and a potter whose name began in Ne., who also used a wavy line above the ovolo, as here. The panels include: (1A) a dog to the left (02004); (1B) two satyrs (Hermet 1934, pl. 19, 80), side-by-side. (2) A warrior (Hermet 1934, 58). Another sherd in 023 (Phase 8), which is probably from this bowl, has a panel with a Victory (Hermet 1934, pl. 20, 103). All the figure types, except for the warrior, are on bowls in the Flavian-Trajanic group from the Bregenz cellar (Jacobs 1913, nos 7, 8, 10, 13). *c.* 90–110. (Not illustrated)

Phase 12 (post fort abandonment)

Stamps Nos 8, 9 and 10.

47. 001, Form 37, Central Gaulish. The ovolo (Rogers B208) and large beads suggest the work of Casurius ii. 160–190. (Not illustrated)
48. 053, Form 37. Two joining sherds from a bowl by X-2 of Les Martres-de-Veyre. Trajanic. (Not illustrated)
49. 053, Form 37, Central Gaulish. A saltire includes beaded diagonals, inner, wavy-line

diagonals in the lower part and side tendrils. The adjacent panel contains a double medallion. Probably by Cinnamus ii. *c.* 150–180. (Not illustrated)

50. 220, Form 30, from Les Martres-de-Veyre. One panel is divided horizontally. The adjacent panel contains a large eagle (02162) used by a potter who supplied moulds to Medetus and Ranto. *c.* 100–125.

Site 66

Phase 2

51. 017, Form 37 (with two joining sherds), Les Martres-de-Veyre. A sphinx (D496) appears on bowls in the so-called Donnaucus style. *c.* 100–125. (Not illustrated)

Phase 3

52. 011, Form 37, from Les Martres-de-Veyre. A Jupiter (D1) stands in a festoon, or the upper cavity of a scroll. The decoration also includes a cornucopia and serpentine motifs. The basal wreath consists of ram's-horn motifs (Rogers G370). Not assignable to a particular potter, but Trajanic. (Not illustrated)

Site 54

Phase 2

53. 018, Form 37. The decoration includes a large hare to the left (Hermet 1934, pl. 26, 70) and a conventional tree with bud-clusters. Both were used by potters working in the tradition of Germanus i. *c.* 80–110. (Not illustrated)
54. 056, Form 37, Central Gaulish. A bowl by a Hadrianic Lezoux potter who rarely used ovolos, but always closed his decoration with a bead-row. The panels contain: (1) a pair of dancers (0363, D210); (2) a saltire, with tulip-leaves at the sides (Rogers G147?), acanthi at the top and bottom (one of the series K5-14), a bifid motif below the upper acanthus (Rogers G285?), and an astragulus above the other; (3) a seated Hercules (D450 variant). The seven-beaded rosettes used as junction-masks are Rogers C280. The tambourine dancer is on a bowl by this potter from South Shields and recurs, together with the acanthus, on a bowl from Lancaster. *c.* 125–140.

Phase 3

Stamp No. 36.

55. 028, Form 37. The trident-tongued ovolo was used by M. Crestio, but almost certainly by other potters as well. The main zone of decoration includes a doe (Hermet 1934, pl. 27, 27) and a conventional tree with bud-clusters, as used by potters working in the tradition of Germanus i. Below this is a zone of stumpy palisades. *c.* 80–110. (Not illustrated)

Site 57

Phase 4

Stamps Nos 19, 20, and 21.

56. 311, Form 29 (with other sherds in 410 and 365 & 446 (Phase 5)). The upper-zone scroll has stirrup-leaves in both concavities and birds and rosettes in the upper and lower concavities, respectively. The lower zone has straight gadroons over a chevron wreath. The mould is by a potter whose style is characterised by the use of beaded borders, as on Form 37 from Fishbourne (Dannell 1971, No. 41), with a scroll very similar to the one here. Another of his bowls, also from Fishbourne (Dannell 1971, 19) has a similar, if not identical, basal wreath. Several bowls of Form 29 stamped by Severus ii have beaded

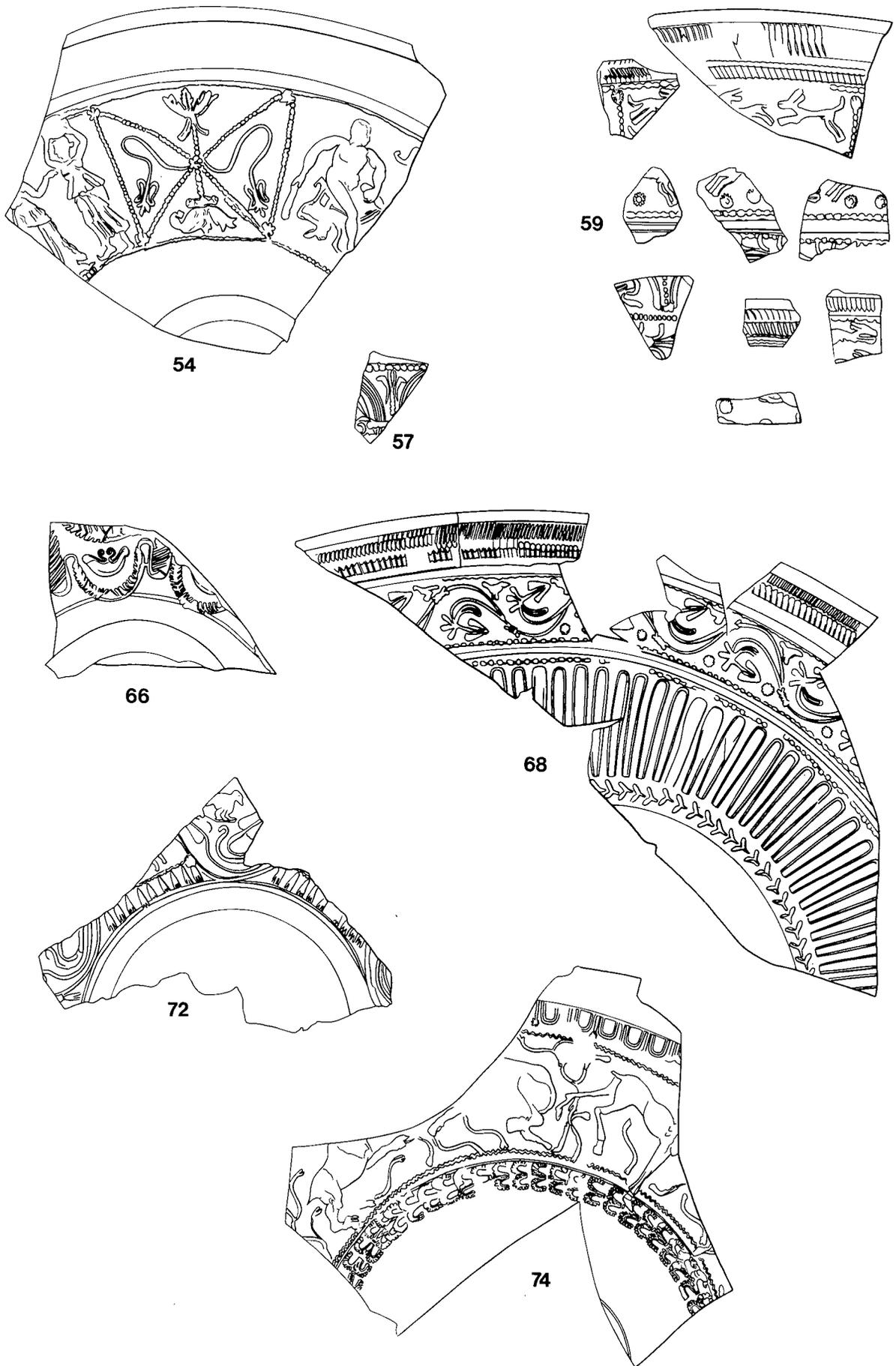


FIG. 110. Samian Nos 54, 57, 59, 66, 68, 72, 74, (1:2).

borders and one from Vechten has the 'butterfly' scroll-tie and rosettes. *c.* 70–85. (Not illustrated)

57. 410, Form 29. The upper zone consists of triple festoons with spirals and a pendant (probably Hermet 1934, pl. 7, 17). A much smaller spiral descends from the upper border. The festoon tie is lower than it should be. *c.* 65–80.

Phase 5

58. 352, Form 37. Triple medallion containing a cupid (D280). *c.* 75–90. (Not illustrated)
59. 416, Form 29 (with sherds in 367; 299 (Phase 6); 192, 398 (Phase 8); 144, 180 and possibly 152 (Phase 9)). One panel in the upper zone has two identical dogs to the right, one above the other, chasing a hare. The lower zone has a wreath of trifold motifs and a zone of festoons, one containing a swan to left (Hermet 1934, pl. 28, 35). All the elements of this zone and also the dog to the right and the rosettes, appear on Form 29 from the civil settlement at Doncaster (Dickinson 1986, pl. 38, 158). One of the characteristics of the potter is his use of beaded borders, unusual in South Gaul, but also occasionally used by Severus ii, with whom there may be some connection. The wreath, dog to the right, and, probably, the hare to the right are on Form 37 by the same potter from Fishbourne, in a context before 75 (Dannell 1971, no. 19). *c.* 70–85.
60. 367, Form 29 (with adjoining sherds in 166). The lower zone is divided into two or more sub-zones. Basal zones with triple-bordered festoons, as here, are common on both Forms 29 and 37 in the early- to mid-Flavian period. The tulip-leaf pendant occurs on Form 29 from the Neuss fortress, stamped with one of Primus iii's later dies, and on Form 37 from Camelon. *c.* 70–85. (Not illustrated)

Phase 6

61. 247, Form 29. Lower zone of S-shaped gadroons, as used by Mercator i and M. Crestio, over another zone. *c.* 70–85. (Not illustrated)
62. 299, Form 30. The sherd has a trident-tongued ovolo used by Vitalis ii. *c.* 70–90. (Not illustrated)

Phase 7

Stamp No. 40.

63. 193, Form 37. A palmate leaf, detached from a scroll, occurs on Form 30s from the Jewry Wall site at Leicester (Stanfield 1938, pl. 1, 6) and the York fortress, both probably with the same ovolo, used by Crucuro i and M. Crestio. *c.* 75–100. (Not illustrated)
64. 245, unusual form. Either a *crater* or a small *lagena*, but with a bold, fluted central cordon. The zonal decoration includes rows of pointed leaf-tips, over a zone of upright astragali. The fabric and glaze suggest Flavian date. (Not illustrated)

Phase 8

65. 196, Form 37 (with another sherd in 025). In the style of Drusus i (X-3) of Les Martres-de-Veyre. The decoration includes double festoons containing acanthi (cf. S & S, pl. 13, 167) and trifold tassels (cf. S & S, pl. 16, 202). *c.* 100–120. (Not illustrated)

Phase 9

Stamps Nos 18 and 39.

66. 141, Form 37. The unusual decoration includes small chevron festoons linked by tendrils, with thick striated spindles between. A larger chevron festoon above occurs on a bowl from Wanborough, Wilts., in the style of Germanus i or an associate. There are no parallels for any of the other motifs. *c.* 80–110.
67. 163, Form 37, with a rosette-tongued ovolo used by Calvus i. *c.* 70–90. (Not illustrated)

68. 194, Form 37. The trident-tongued ovolo was occasionally used by Frontinus, and appears on a bowl from Rocester with one of his less-common mould stamps.

Phase 10

Stamps Nos 2, 14, and 37.

69. 052, Form 37, in the style of Igocatus (X-4) of Les Martres-de-Veyre. A panelled bowl, including: (1) A man with *chlamys* (D338), over an altar (S & S, pl. 17, 207); (2) A pedestal (S & S, pl. 17, 207); (3) A sea-cow (D29). The crowns used as junction-masks are Rogers U62. *c.* 100–120. (Not illustrated)
70. 060, Form 37, from Les Martres-de-Veyre. Two panels with small double medallions, one containing a lion's head, to left. There is perhaps a large acanthus, upside-down, at the bottom of the panel border. Cf. a bowl in the so-called Donnaucus style (S & S, pl. 47, 556) for the medallions. *c.* 100–125. (Not illustrated)
71. 076, Form 37, Central Gaulish. One panel has an unusual saltire, with tendrils springing from the ends of an astragulus across the middle. The adjacent panel has a chevron festoon at the top (Rogers F41), a central band of rings and a lower part containing a crouching lion (D753) over a leaf (Rogers H153). The seven-beaded junction-masks are Rogers C280. A bowl in the style of Secundinus ii (Rogers's Secundinus I). *c.* 125–140. (Not illustrated)
72. 082, Form 29 (with sherds in 142 and 051 (Phase 12)). The lower zone consists of a scroll, with tapering leaves and a bird (Hermet 1934, pl. 28, 58) in the upper concavity. The lower concavity contains a row of pointed leaf-tips, probably with an animal above, separated by a wavy line. Cf. the upper zone of a bowl from Mainz, stamped by Sabinus iii (Knorr 1919, taf. 69 B). *c.* 70–85.
73. 085, Form 37. The trident-tongued ovolo is probably one used by Sabinus iv and Sulpicius. One panel contains a Bacchus (Hermet 1934, pl. 19, 70 variant), as on a bowl from Rottweil stamped by Sabinus (Knorr 1909, taf. III, 1). The adjacent panel contains a bird to left looking back. The decoration also includes a satyr (Hermet 1934, 90) and a plant (similar to Knorr 1919, taf. 27, 6, under Cotto). *c.* 80–110. (Not illustrated)
74. 085, Form 37, in the style of X-2 of Les Martres-de-Veyre, with his single-bordered ovolo (Rogers B28). The main zone of decoration contains a panther to left and a horse and bear to right, with a tree made up of separate serpentine motifs, cf. S & S, pl. 9, 118, which is probably from the same mould. *c.* 100–120.
75. 121, Form 37, Central Gaulish. The basal wreath of chevrons, with beads below, is on a bowl from the Birdoswald alley find (S & S, pl. 90, 3), under Condollus, but more probably by Rogers's Secundinus I. *c.* 125–140. (Not illustrated)
76. 142, Form 15/17 or 18, with part of a graffito,]Λ[or]V[, inscribed under the base, after firing. Flavian. (Not illustrated)
77. 328. Three joining fragments of Form Curle 11, from Les Martres-de-Veyre. The broken flange has been smoothed down to the level of the lower wall. Trajanic. (Not illustrated)
78. 350, Form 37. The panels include: (1) A figure to left; (2A) an animal to left; (2B) diagonal wavy lines, flanking a pyramid of pointed leaf-tips. The design is badly laid out and the animal and wavy lines overlap the borders. *c.* 75–100. (Not illustrated)

Phase 11

79. 119, Form 37 with a leaf used by Attianus ii and Drusus ii (Rogers H58). *c.* 125–145. (Not illustrated)
80. 127 (also probably a sherd in 136), Form 37, from Les Martres-de-Veyre, with an ovolo-replacement of beaded rings (probably Rogers C292), as used by the mould-maker X-12. The borders of this zone are not parallel. *c.* 100–125. (Not illustrated)

Phase 12

Stamps Nos 15, 16, and 17.

81. 117, Form 37, Central Gaulish, with an ovolo used by Iullinus ii (Rogers B164). *c.* 160–190. (Not illustrated)
82. 128, Form 37, from Les Martres-de-Veyre, probably from a mould by the potter X-13. A panel contains a small double medallion. The junction-mask for the borders is probably a beaded rosette (cf. S & S, pl. 46, 531). *c.* 100–125. (Not illustrated)

Phase 14 (post fort abandonment)

Stamps Nos 13 and 38.

83. 088, Form 37, Central Gaulish, perhaps with a rosette-tongued ovolo used by Sacer i, Docilis i, etc. (Rogers B24?). Hadrianic or early Antonine. (Not illustrated)
84. 089, Form 37, Central Gaulish. The decoration includes a naked figure (D347) and a plant (Rogers L20), used twice, side-by-side. Below the figure is a small ring, containing a rosette with hollow (?) centre and wedge-shaped petals. The plant suggests a connection with Sacer i and his associates. *c.* 125–145. (Not illustrated)

'Cleaning contexts'/Unstratified

85. 124, Form 37, from Les Martres-de-Veyre. A scroll, bound with a double astragalus, has a small vine-scroll inside. *c.* 100–125. (Not illustrated)
86. 166, Form 29, South Gaulish. The basal wreath of trifold motifs was used by several potters, including Memor and Mommo (cf. a bowl from the Pompeii hoard, with a signature of Memor (Atkinson 1914, no. 74)). (Not illustrated)

Site 53

Phase 2

87. 212, Form 29. The lower zone consists of straight gadroons, typical of the period *c.* 60–80.

Phase 3

Stamp No. 29.

88. 1139, Form 29 or 30. The decoration includes a panel with serrated, heart-shaped leaf (slightly smaller than Hermet 1934, pl. 8, 31). The adjacent narrow panel has a vertical series of fan-shaped motifs (Hermet 1934, pl. 12, 72 or similar). *c.* 70–85. (Not illustrated)
89. 1142, Form 37, with zonal decoration. The upper zone, perhaps panelled, probably includes running animals. A scroll in the lower zone has a heart-shaped leaf and small rosette in the upper concavity. The lower concavity contains a Cupid (Hermet 1934, pl. 18, 39) and bud (Hermet 1934, pl. 10, 60). The Cupid and rosette were used by Calvus i, and appear on a bowl in his style from London (Museum of London). He also used similar leaves. *c.* 70–90. (Not illustrated)
90. 1186, Form 29. The scroll in the upper zone has rows of leaf tips in the lower concavity, as used by Murranus and some of his contemporaries (cf. Knorr 1952, taf. 44C, from Bregenz). *c.* 60–75. (Not illustrated)
91. 1490, Form 37. The ovolo with four-pronged tongue was used by M. Crestio and Crucuro i (Knorr 1919, taf. 28A). The decoration is panelled, and includes a figure to left. *c.* 75–110. (Not illustrated)
92. 1841, Form 29. A composite motif in the lower zone has side tendrils ending in heart-shaped leaves with serrated edges (smaller than Hermet 1934, pl. 8, 44). At the bottom of the motif is a five bladed plant (perhaps Hermet 1934, pl. 12, 68). Both details appear on separate bowls in a group of early Flavian samian from York. *c.* 70–90.

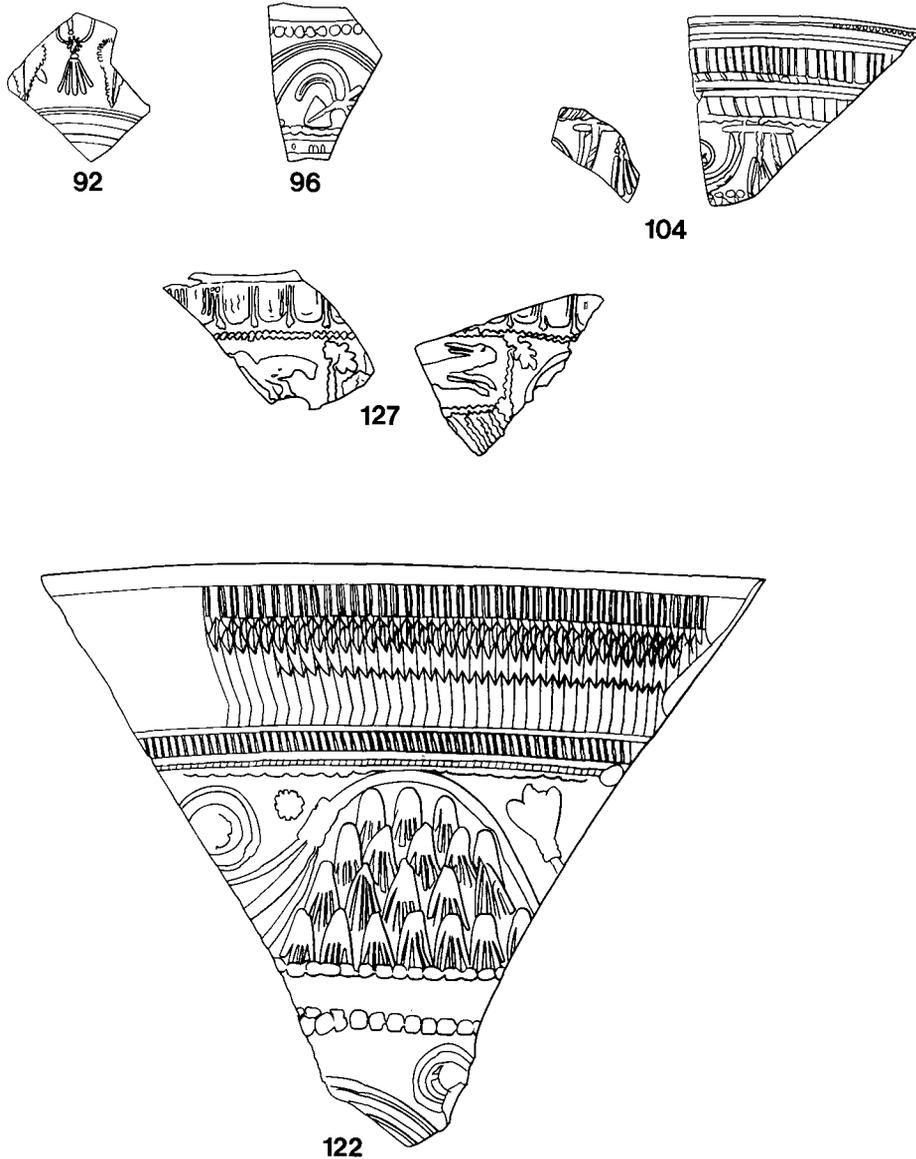


FIG. 111. Samian Nos 92, 96, 104, 127 (1:2), 122 (1:1).

Phase 5

Stamp No. 26.

93. 1090, Form 37. One zone of decoration consists of double festoons, one containing a crouching hare, to right, with tassels between. The zone below probably contains a scroll with spirals. *c.* 70–90. (Not illustrated)
94. 1147, Form 37. The ovolo, with narrow core and four-pronged tongue, occurs on bowls from Scotland, and on two from Verulamium, Period IIA/B (Hartley 1972, D72-3). *c.* 75–95. (Not illustrated)
95. 1729, Form 35, with unusually narrow flange and small barbotine leaves. Flavian-Trajanic. (Not illustrated)
96. 2506, Form 29, with triple festoon and stirrup-leaf in the upper zone. The leaf appears on a bowl from La Graufesenque (Rodez Museum), stamped by Calvus i, and both motifs are on an unstamped Form 37 in the Pompeii hoard (Atkinson, 1914, no. 63). *c.* 70–85.

Phase 6

Stamp No. 25

97. 939, Form 37. The ovolo with four-pronged tongue was used by M. Crestio and Crucuro i. c. 75–110. (Not illustrated)

Phase 7

Stamps Nos 41 and 43.

98. 578, Form 37. The upper surviving zone consists of a scroll, with rows of pointed leaf-tips in the lower concavities. The lower zone has diagonal wavy lines in one panel and a dog to left, with a row of three small rings below and one above. The dog is on three bowls in the Pompeii hoard (Atkinson 1914, nos 10, 32, 76). c. 70–90. (Not illustrated)
99. 796, Form 30. The rosette-tongued ovolo is on a variant of Form 37 from La Graufesenque with a cursive signature Calvo (almost certainly Calvus i) in the decoration and a plainware stamp of Patricius i on a handle. A bowl from the same mould occurs at Fishbourne (Dannell 1971, no. 49). c. 70–90. (Not illustrated)
100. 818, Form 29. One of the sub-zones in the lower zone consists of a wreath of leaves, perhaps those on a bowl from Bregenz stamped by Calvus i (Knorr 1919, taf. 18D). c. 70–85. (Not illustrated)
101. 822, Form 29. The upper zone includes a dog to left (Hermet 1934, pl. 26, 40). A panel in the lower zone has corner-tassels of heart-shaped leaves, perhaps as on a bowl in the Pompeii hoard (Atkinson 1914, no. 60), and a double or triple medallion. c. 70–85. (Not illustrated)
102. 822, Form 37. The ovolo, dog, and grass-tuft (Knorr 1919, taf. 57, 19, 6 and 13 respectively – the grass-tuft here is in fuller impression) were all used by Mercator i. The decoration is probably zonal. c. 80–110. (Not illustrated)
103. 996, Form 37. One panel has corner-tassels (Hermet 1934, pl. 12, 58?) and a triple medallion containing a Cupid (O436A). The top part of the adjacent panel has a dog to left (02004). Mercator i used the ovolo (Knorr 1919, taf. 57, 19) and dog. He also used this medallion, in partial impression, as a festoon. His usual triple medallion, which he rarely used, is slightly smaller. c. 80–110. (Not illustrated)

Phase 8

Stamp No. 42.

104. 586 (with another sherd from 1002 Phase 9), Form 29. The festoons in the upper zone, containing spirals, either consist of chevrons or have striated outer borders. The four-bladed tassel is on Form 37 from Bainbridge, with an ovolo used by M. Crestio and, probably, some of his contemporaries. c. 70–85.
105. 787, Form 37. The decoration includes a zone of straight gadroons, above a basal wreath of trifid motifs (Knorr 1919, taf. 13, 4). This motif appears on Form 29s stamped by the Bassus i – Coelus firm, Calvus i and Meddillus and on Form 37s in the style of Calvus. c. 70–90. (Not illustrated)
106. 821, Form 29. The lower zone includes a panel with triple medallion and corner-tassels with heart-shaped leaves. c. 70–85. (Not illustrated)
107. 1009, Form 29. The decoration includes the same medallion and corner-tassel as 23 above. c. 70–85. (Not illustrated)
108. 1009, Form 37, probably slightly burnt. The decoration includes two zones, both with panels containing diagonal wavy lines, the ones in the upper zone flanking rows of leaf-tips. c. 70–90. (Not illustrated)

Phase 9

109. 1822, Form 29. The scroll in the lower zone includes an almond-shaped leaf and a beaded tie. This leaf, similar to Hermet 1934, pl. 9, 34, is usually pre-Flavian and appears on a bowl from the Gloucester Kingsholm site (Wild 1985, fig. 23, 24), but is also on a bowl

in an early Flavian group from York, which has a beaded scroll-tie. *c.* 55–75. (Not illustrated)

110. 3612, Form 37. A panel contains a boar to left and a conventional grass-blade, over a zone of triple festoons. There is little in the way of dating evidence, as the boar does not seem to be known, but the wavy-line border suggests that the bowl is Flavian. *c.* 75–95. (Not illustrated)

Phase 11

Stamps Nos 24, 31, and 45.

111. 600, Form 37. A panel contains a bird to left (Hermet 1934, pl. 28, 58 or similar). The adjacent panel has a naked figure facing forwards. *c.* 75–100. (Not illustrated)
112. 2255, Form 37 rim. The trident-tongued ovolo is probably one used occasionally by Frontinus. *c.* 75–100. (Not illustrated)
113. 2301, Form 37. The trifid motif in the basal wreath (Knorr 1919, taf. 54, 15) was used by potters who made both Forms 29 and 37. The wreath above it consists of small chevrons. The main zone includes a rosette. *c.* 70–90. (Not illustrated)
114. 3373, Form 29. The scroll in the lower zone has rows of leaf-tips in one of the lower concavities. These occur on an early Flavian bowl from York and one from Camelon. *c.* 70–85. (Not illustrated)

Phase 12

115. 310, Form 29. The upper zone includes a series of diagonal wavy lines flanking a heart-shaped leaf, perhaps at the top of a triangle of leaves. *c.* 70–85. (Not illustrated)
116. 310, Form 37. The upper part of a panel contains an eagle and hare (O2186). The adjacent panel probably contains a Diana and hind (Hermet 1934, pl. 18, 7?). *c.* 80–110. (Not illustrated)
117. 310, Form 37. The basal wreath of S-shaped gadroons was used by Mercator i, M. Crestio, and some of their contemporaries. A saltire panel has a four-bladed plant in the bottom quadrant (Knorr 1919, taf. 57, 11). *c.* 80–110. (Not illustrated)
118. 2034, Form 37. The decoration is almost the same as a bowl in Phase 11 (No. 113 above), but with the addition of a striated spindle in the main zone. (Not illustrated)

Phase 13

119. 2022, Form Ritterling 12 or Curle 11 flange. First-century Lezoux ware, in pale, micaceous fabric with a dull orange glaze. Late Neronian or early Flavian. (Not illustrated)
120. 2212, Form 37. The decoration includes a chevron wreath over a panel with a double or triple medallion and a corner-tassel with heart-shaped leaf. *c.* 70–90. (Not illustrated)

Phase 14

Stamp No. 30.

121. 128, Form 37. The decoration includes a plant made up of fan-shaped motifs used by Mercator i and some of his contemporaries (Knorr 1919, taf. 57, 11). *c.* 80–110. (Not illustrated)
122. 307, Form 29. The scroll in the upper zone has rows of pointed leaf-tips in the lower concavity and spirals, trifid motifs, and small rosettes in the upper concavity. The lower zone includes a triple medallion, almost certainly in a panel with spirals in the corners. *c.* 70–85.
123. 3136, Form 37 (two sherds, with one in 3154 (joining) and others in 3137, 3216 (4), 3293 (2), 3331 and (probably) 3179 (5)), from Les Martres-de-Veyre. A bowl in the style of X-14, a potter who supplied moulds to Donnaucus. The ovolo is probably Rogers B6. The panels include a lion to left (D766), panthers to right (D799 and O1500), a horseman with shield (D159), and bear to right. Seven-beaded rosettes (Rogers C280) mask the ends of the borders. *c.* 100–120. (Not illustrated)

Phase 15

Stamp No. 44.

Phase 16

124. 069, Form 30, in the style of X-2 of Les Martres-de-Veyre. The decoration includes his single-bordered ovolo (Rogers B28), a Cupid to left, and a crown (Rogers U61). *c.* 100–120. (Not illustrated)
125. 113, Form 37. One panel has a festoon with a pendant to one side (Knorr 1919, taf. 57, 20) in the basal zone. *c.* 80–110. (Not illustrated)
126. 153, Form 37, Central Gaulish. The ovolo with straight line below occurs on a bowl from Lancaster in the style of Avitus iii (S & S, pl. 64, 19), though that has an additional, beaded border below the ovolo. A leaf with serrated edge and a small trifold motif, both pointing upwards, are not closely paralleled, though the latter is probably on bowls in his style from Augst (S & S, pl. 62, 5) and Alcester. *c.* 125–150. (Not illustrated)

Phase 18 (post fort abandonment)

Stamps Nos 22 and 23.

127. 016, Form 37. The ovolo is probably trident-tongued. The upper part of a panel has a hare to right and the lower part includes diagonal wavy lines. The adjacent panel has a bud-cluster in one upper corner, in the manner of L. Tr. Masc(u)lus and some of his contemporaries (cf. Knorr 1952, taf. 37A). Another sherd (in 001) has a bird to left (Hermet 1934, pl. 28, 50). *c.* 80–110.
128. 016, Form 37, from Les Martres-de-Veyre, with a rosette-tongued ovolo (Rogers B6?). The free-style scene includes a lion (D766), bear to right (D809 variant), and astragalus (Rogers R12?). The bowl is from a mould by one of the potters who supplied Donnaucus. *c.* 100–125. (Not illustrated)
129. 016, Form 37, in the style of one of the potters at Les Martres-de-Veyre who supplied moulds to Donnaucus. The decoration includes two grass-tufts, side-by-side (Rogers L19) and, probably, stags to left. *c.* 100–125. (Not illustrated)
130. 016, Form 37, with a leafy festoon used at Les Martres-de-Veyre (Rogers F8). Trajanic. (Not illustrated)
131. 018, Form 37. One panel has a corner-tassel. An adjacent panel has diagonal wavy lines and, probably, a triangle of leaf-tips. *c.* 70–90. (Not illustrated)
132. 1849, Form 29. The lower zone includes a trifold motif, flanked by bifid motifs, on beaded stems. Late Neronian or early Flavian. (Not illustrated)
133. 1905, Form 18/31, grooved for a rivet, in the fabric of Les Martres-de-Veyre. (Not illustrated)
134. 2939, Form 37, in the style of Drusus i (X-3) of Les Martres-de-Veyre. A winding scroll is separated from a basal wreath of ram's-horn motifs (Rogers G366) by Drusus i's dotted border (cf. S & S, pl. 13, 168). *c.* 100–120. (Not illustrated)
135. 2940, Form 29, a late example of the form. The deep upper zone has panels including: (1) three twelve-petalled rosettes, in vertical series; (2) a motif including trifold plant, impressed sideways. This plant was probably not used before 80 and appears on a bowl from Rottenburg which looks Flavian-Trajanic (Knorr 1910, taf. 1, 2). (Not illustrated)
136. 2975, Form 37. A small fragment, with a trident-tongued ovolo and a panel containing a figure to left (probably the Cupid D280). *c.* 80–110. (Not illustrated)
137. 3138, Form 30. The decoration is badly eroded, but one panel contains a Victory (Hermet 1934, pl. 20, 104), used in the Flavian-Trajanic period. *c.* 85–110. (Not illustrated)

'Cleaning contexts'\Unstratified

138. 969, Form 37. The trident-tongued ovolo is a common one, but has not so far been recorded on stamped or signed bowls (see Knorr 1910, taf. II, 2, from Rottenburg). One

panel contains a dog to right (01922 variant). The bowl has sharp zig-zag borders, with rosettes at the top. *c.* 75–100. (Not illustrated)

139. 2250, Form 37. The basal wreath consists of small bifid motifs. *c.* 70–90. (Not illustrated)

THE MORTARIA (FIGS 112–116) By D. R. Evans and K. F. Hartley

Introduction

While the quantity, and to a lesser extent the quality, of the collection from Loughor cannot compare with two recently published groups of material – from the legionary fortresses at Usk (Manning 1993) and Exeter (Holbrook & Bidwell 1991) – it is probably the largest collection of published material from a fort site which has a mainly Flavian to Trajanic date range. Without comparative groups it is difficult to be certain how typical the group might be, indeed it is possible that the nature of the areas excavated have produced an atypical collection, but, this said, certain interesting points can be made.

The mortaria is dominated by material from three main sources – Gallia Belgica, Verulamium, and Loughor itself. The predomination of Gallic vessels (perhaps as much as 60 per cent of the vessels present come from this source) need cause little surprise, because this is a common phenomenon on first- to early second-century sites. The only slightly puzzling aspect is that the types present, assuming some sort of constant breakage rate, indicate that occupation at Loughor began somewhat earlier than the evidence from other studies might indicate (some small quantities of pre-Flavian coins, amphorae, and metalwork have also been recovered). This may simply reflect the type of areas excavated or, as seems more likely, the fact that because of their robust nature some of the earlier mortaria forms survived much longer in use. There are no particular concentrations of material from Gallic sources so we cannot explain the proportion as a result of clearance.

The number of vessels from Verulamium, although proportionately higher than Usk and perhaps as high as 10 per cent at Loughor, almost certainly reflects army contracts, probably to fill the shortfall (later types are present) between initial occupation of the site and the establishment of the local industry.

The local industry certainly has its interesting aspects. Approximately 25–30 per cent of the vessels from the site were produced locally and if we exclude vessels which reached the site before *c.* 90 or after *c.* 85\90 the proportions might be as high as 80 per cent.

The origins of the industry could be the subject for much speculation but this is perhaps out-of-place here; it is perhaps enough to note that the early forms are almost exact copies of vessels from Gallia Belgica. The potters soon developed their own particular styles which have many similarities to the general run of late Flavian\Trajanic types, especially perhaps Wroxeter. Site dating at Loughor indicates either that many of the styles were introduced somewhat earlier or, as seems more likely, the dating of these styles has been too conservative. Whatever the origins of the industry, it would appear likely that the garrison brought much of its pottery supplies with it and local industries developed when settlement became more permanent.

Most of the rest of the material was derived from the Caerleon area with an occasional vessel probably from the Gloucester area; such vessels are not unexpected at Loughor, but two areas of supply need a little extra comment. Although only four or five vessels derive from sources in the West Midlands (B6 & B8), this source is certainly rather a surprise, but the presence of this group may be explained by troop movements with all the vessels arriving *c.* 100\110 with a change of garrison. The second group, although probably produced in Baetica, are more likely to have arrived at Loughor from Exeter rather than directly from Spain. Although vessels in this fabric are rare at Caerleon, perhaps there is a case for re-examination of much of the Caerleon material, some connection with troops, perhaps officers of *legio II Augusta* might be suspected as the owners of these vessels.

Archive

The full mortaria report by K. Hartley is retained in the archive. The information in this report is ordered into two main sections – a catalogue of the fabrics present and an illustrated vessel type series for Loughor.

The Fabrics*Fabric Group A: Continental*

Fabric A1: from potteries in central France (Massif Central)

Self-coloured, fine-textured cream fabric. Inclusions: sporadic, usually angular and largish quartz. Trituration grit: all quartz. (For variants see Holbrook & Bidwell 1991, FC6–11).

Fabric A2: Pas de Calais, with other workshops in Gallia Belgica and Colchester

Self-coloured, fine-textured, brownish-cream, cream to yellowish-cream fabric, some times with a pink core: fair to moderate, tiny quartz, red-brown (sometimes larger than other inclusions), black and sometimes chalk inclusions. Trituration grit consists mainly of flint with some quartz. Products of several workshops are included and the products cover a substantial period.

The majority of mortaria in this fabric from Loughor come from Gillam Form 238 which can be dated to 65–100. Although some can certainly be attributed to the Pas de Calais area others must be given the more generalized attribution of Gallia Belgica. (For fabric variants see Holbrook & Bidwell 1991, FC2–5.)

Fabric A3: ?Spain, possibly Baetica

Very hard, micaceous and slightly granular, greyish-cream fabric, occasionally pink in the core. The granular quality is produced by frequent to close-packed, usually well-sorted, mostly miniscule quartz grains; there may also be sparse to rare, larger and ill-sorted, opaque red-brown and black inclusions. Trituration grit: mostly translucent whitish quartz, sometimes with opaque white and pinkish quartz. The mortaria may have a self-coloured or brownish slip. Vessels in this fabric are also known at Caerleon (Hartley, K., 1992, 100).

Fabric A4: Rhineland

Hard, dense, purplish-pink fabric with blue-black core fired to cream at the surface. Inclusions very moderate, ill-sorted quartz; rare opaque black material. Trituration grits: entirely transparent and translucent quartz. Present in small quantities at Loughor.

Fabric A5: Rhineland

Fine-textured, greyish-white matrix. Inclusions: ill-sorted quartz and rare, natural, red-brown oxides. Trituration grit: ill-sorted quartz. Self-coloured. A single unillustrated vessel in this fabric was present at Loughor.

Fabric Group B: long distance British 'imports'

Fabric B1: Oxfordshire (Young 1977). 100–400+

Slightly sandy off-white fabric occasionally with a pink core, and cream to buff slip; there is a little very fine quartz and red-brown tempering. The very distinctive trituration grit consists entirely of mixed pink, brownish and transparent quartz. Although production of these factories begins c. 100, wider distribution cannot be shown to take place before c. 240 and probably not before 270. A variation of this fabric can be very granular and often has a pink core, and without the distinctive trituration grit it can be difficult to distinguish from Verulamium products.

Fabric B2: Oxfordshire (Young 1977). 240–400+

Fine-textured, orange-brown fabric, slightly micaceous, sometimes with a grey core and a red-brown samian-like exterior; trituration grit is identical with that for B1. A variation of this fabric has a thin white slip. Vessels in this fabric are often difficult to distinguish from Caerleon ware (C3) especially when affected by the soil, and the sherds noted in the archive could well be from Caerleon ware vessels.

Fabric B3: Mancetter-Hartshill, Warwickshire. *c.* 100–370+

Fine-textured, creamy white usually with a minimal amount of fine quartz tempering. The trituration consists largely of crushed pottery waste, either red-brown or greyish-black in colour with occasional quartz or quartzite grits. There are considerable variations in fabric as would be expected at such a major production site. A small quantity of material from no more than two vessels is present at Loughor.

Fabric B4: Gloucestershire or just possibly north Wiltshire. Mid-second century to some time in the fourth century.

Granular, sandy fabric, fired to orange-brown at the surface with thick grey core and a cream or white slip; much quartz with occasional red-brown (?iron-rich) and black particles. Trituration grit: transparent, white and pinkish quartz, opaque red-brown and black material. No kilns are known but a single source is indicated. The fabric is also referred to as SWWS, i.e. South-West White-Slipped ware. Perhaps not surprisingly, due to the date range, this fabric is poorly represented at Loughor.

Fabric B5: 'Verulamium' region *c.* 70–160 as imports to South Wales

Usually a granular, greyish-cream fabric, sometimes with a pink or black core often with a cream to buff slip; the fabric colour and/or the slip can be reddish-brown. The texture is obtained by the addition of a massive quantity of well-sorted quartz inclusions together with some flint and occasional red-brown material. The trituration consists of flint, red-brown material and a little quartz. One variation of this fabric, although generally similar, has a rather smoother feel.

Fabric B6: South-West Midlands, probably on the Jurassic outcrop

Very hard, pale brown fabric, with well-defined orange-pink core. Inclusions: moderate very tiny (visible at x20), to medium-size quartz, red-brown and black ?slag with rare soft cream (non-reactive) ?clay pellets and slivers of clay. Thin cream slip. Trituration grit: quartz; clusters of quartz grains and red-brown ?slag. Only one vessel in this fabric is represented at Loughor.

Fabric B7: South-West England, probably Gloucester

Hard, slightly grainy fabric; bright orange-brown and may incorporate two different shades within the same pot. Inclusions: few and ill-sorted, sporadic, dark brown material and quartz. Surface treatment; self-coloured slip or self-coloured. Trituration grit: small to large, mixed, angular, quartz, clusters of quartz, brown sandstone, hard red-brown material.

Fabric B8: Wroxeter

At least three varieties of this fabric are present. The fabric is cream which can vary from powdery to fine; the inclusions consist of quartz, red-brown material and blackish ?slag. Trituration grit consists of quartz burnt with red-brown sandstone and rare black material. Some varieties are self-coloured or with a self-coloured slip, others have a brownish orange slip which can vary from buff to brown and may be darker round the spout area.

*Fabric Group C: short to middle distance imports and/or local products*Fabric C1: 'Caerleon' ware (Boon 1966). *c.* 110–80

Soft, fine-textured, slightly micaceous orange to orange-brown fabric with no visible tempering; white quartz trituration grit. These mortaria always had a red-brown, samian-like slip but this does not often survive in acid soil conditions. It has been pointed out (Greep 1986, 55–6) that there is a lack of intermediate mortaria forms between 'Caerleon' and Oxfordshire products so the industry may continue somewhat later. Hardly any true 'Caerleon' products are represented at Loughor and none can be illustrated.

Fabric C2: Caerleon

This fabric group is reminiscent of 'Caerleon' ware (Fabric C1) but the fabrics are not as fine-textured. They also differ in the surface treatment and in having a little sandstone among the angular white-quartz trituration grit. Fine-textured, micaceous, pinkish-brown (or fawn-brown) fabric, occasionally with a blackish core, sometimes with a greenish tinge. Inclusions vary but are always rare; they include patches or streaks of cream material (?clay) and sporadic red-brown material, probably including sandstone. The surface appearance varies from self-coloured or self-coloured slip to a thick cream slip. Some varieties are extremely rich in a deep red-brown material, perhaps haematite which can show up in a most striking way in a fresh break. Although a number of variations in the fabric can be noted the similarities to the fabric of oxidized coarsewares from recent sites (see Webster in Evans forthcoming b) and earlier excavations at Caerleon (see for example Quartermaine 1992, 98; redware fabric 2\3) indicate that the main centre of production lay at or near Caerleon.

Fabric C3: Loughor

Generally orange-brown fabric sometimes with a drab, brownish-grey or occasionally grey core. Inclusions: moderate to fairly frequent, ill-sorted; mostly quartz with occasional red-brown material (?sandstone). Trituration grit: mixed small to large, angular quartz, red-brown sandstone, brown slaggy material and opaque white material. The slip varies from thick red-brown, to a thin, matt self-coloured slip; some vessels have a cream slip which rarely survives. This fabric group covers a wide range of variations but has much in common with Coarseware Fabric *b* (see Webster below p. 335). Although there seems little doubt that all the vessels in this fabric group came from a single source it should also be noted that some of the vessels have a somewhat finer finished appearance than others; most of the vessels with a cream slip can be included in this fabric group. Although not always the case these vessels have the aspect of being 'table' rather than 'kitchen' wares. They are distinguished in the catalogue below as Fabric C3.1. From what can be seen in the range of forms associated with this fabric group a date range of *c.* 90–110\20 can be given, but as is almost always the case the site dates the pottery and a date range of *c.* 80–100\110, with less production towards the end of the period, appears probable. A second (No. 59) produced in this fabric should be noted.

Fabric C4: South Wales

Smooth, fine-textured, bright orange fabric. Inclusions: few sporadic, ill-sorted quartz; rare black material. Trituration grit: entirely quartz. No slip survives.

Fabric C5: South Wales or South-West England

Slightly abrasive, light brown fabric. Inclusions: fairly frequent quartz, rare ill-sorted dark brown material. Trituration grit: quartz, red-brown and brown. Slip unknown. This fabric can be paralleled at Usk (Hartley, K, 1993, Fabric 41).

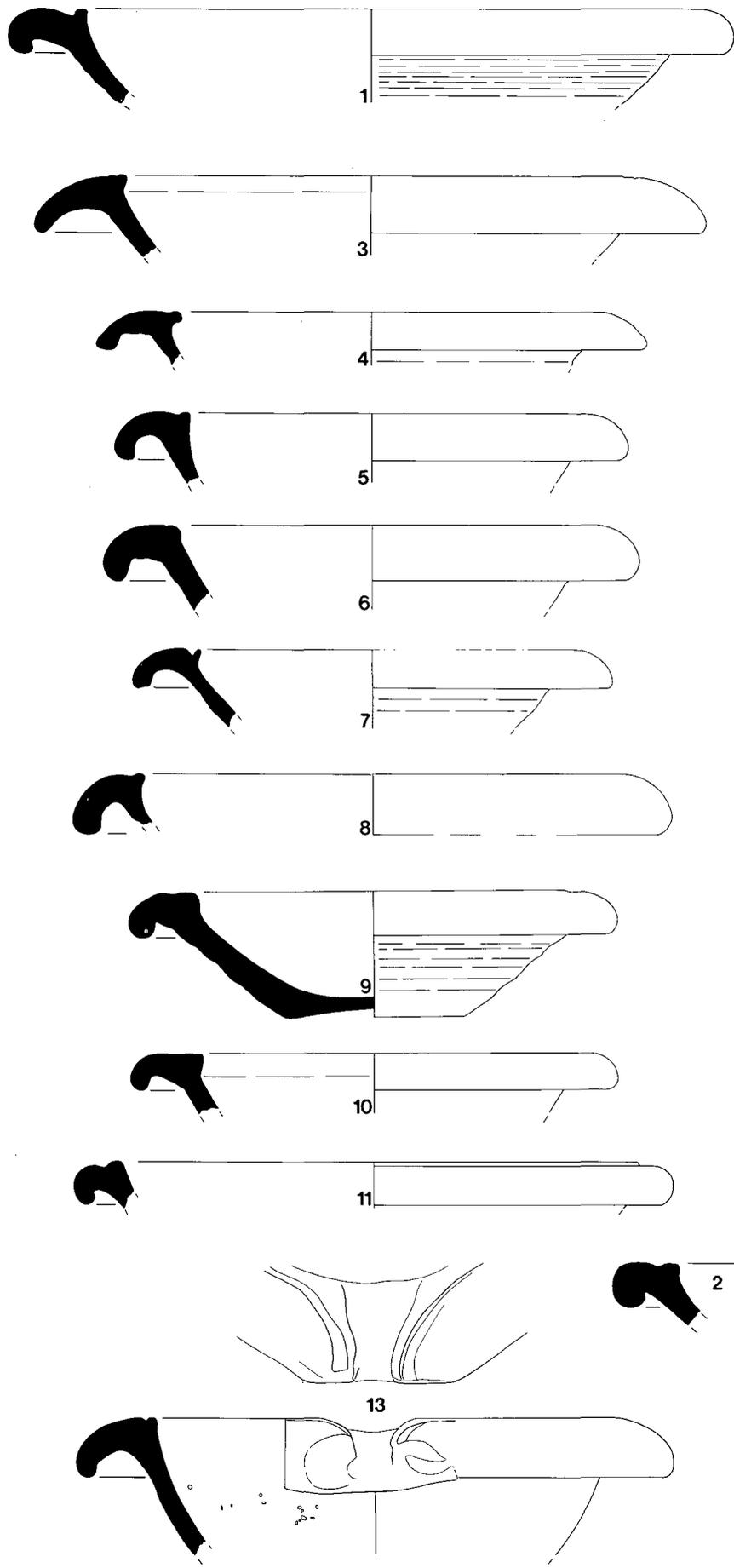


FIG. 112. Mortaria Nos 1-13 (1:4).

Type series catalogue

The following catalogue consists of a single example of each mortaria type present at Loughor; full details are retained in the archive report. For ease of reference, the type series has been ordered by site and fabric group.

Group A fabrics

1. 55\020. Fabric A2, probably Pas de Calais. This mortarium has a rather squat rim because the flange has been folded under; it lies between a Gillam 238 and a Bushe-Fox 26–30. 65–100+.
2. 55\020. Fabric A2, Pas de Calais. This mortarium has a rather squat rim because the flange has been folded under; it lies between a Gillam 238 and a Bushe-Fox 26–30. 65–100+.
3. 55\093. Fabric A2.
4. 55\255; 69\264. Fabric A2, Pas de Calais. 65–100.
5. 55\300. Fabric A2, Pas de Calais. Circular rivet-hole through body and another partly drilled from underneath the flange. 65–100.
6. 69\008. Fabric A2, heavily worn. Gallia Belgica, Hartley (1977) Group I. 50–85.
7. 69\056. Fabric A2, Pas de Calais. 65–100.
8. 69\160. Fabric A2, Hartley (1977) Group I. 50–85.
9. 69\235. Fabric A2, Gallia Belgica. Bushe-Fox Type 26–30. 70–150.
10. 69\258. Fabric A2, Pas de Calais. 65–100.
11. 69\317. Fabric A2, Gallia Belgica. Bushe-Fox Type 26–30. 70–150.
12. 57\088. Fabric A3 (Holbrook & Bidwell 1991, 189, 194 & fig. 77), heavily burnt. *c.* 50–85.
13. 57\332 (235). Fabric A2, well worn. A stamp of Q Valerius Veranius survives (Stamp No. 2 below). 65–100.
14. 57\332; 57\409; 57\085. Fabric A2. This example is a variation on Fabric A2, being a distinct shade of brown, but in all other aspects it conforms with the characteristics of this fabric group. 65–100.
15. 57\378. Fabric A3 (Holbrook & Bidwell 1991, 189, 194 & fig. 77), heavily burnt. *c.* 50–85.
16. 57\445 (274). Fabric A2, very worn. One stamp of Sextus Valerius Eclectus survives (Stamp No. 1 below) Colchester. 60–90.
17. 57\487. Fabric A2, Hartley (1977) Group II. 65–100.
18. 53\269. Probably Fabric A2, burnt.
19. 53\818. Fabric A2, Colchester source is more likely than a continental one. 50–85.
20. 53\886. Fabric A1, Gaul. 50–85.

Group B fabrics

21. 55\045. Fabric B5 (see Frere 1972, no. 2136). 150–200.
22. 55\082; 55\036; 55\143. Fabric B5.
23. 55\093 (089). Fabric B6. The compressed stamp with TETL ligatured, can be interpreted as Tetlonus, a known Celtic name (Stamp No. 5). Other stamps from the same die have been noted from Alcester and Penydarren Park.
24. 55\159; 55\205. Fabric B5, well worn. The potter's name-stamp survives interpreted as Marinus as well as his counter-stamp reading *fecit* (Stamp No. 4).
25. 55\255; 69\243. Fabric B4, self-coloured slip. Part of a circular rivet-hole survives, drilled into the body from the top of the flange, worn. Probably 100–50.
26. 69\023. Fabric B5. Smooth flange; concentric scoring inside. 60–90.
27. 69\154 (137). Diameter 290 mm. Fabric B7, probably Gloucester. Two poorly impressed diagonally-placed stamps of A Terentius Ripanus survive reading]TERE || RIPI (Stamp No. 6). So heavily worn that all the trituration grit has been worn away. A circular rivet-hole in the base shows that an attempt has been made at a repair. 60–90.

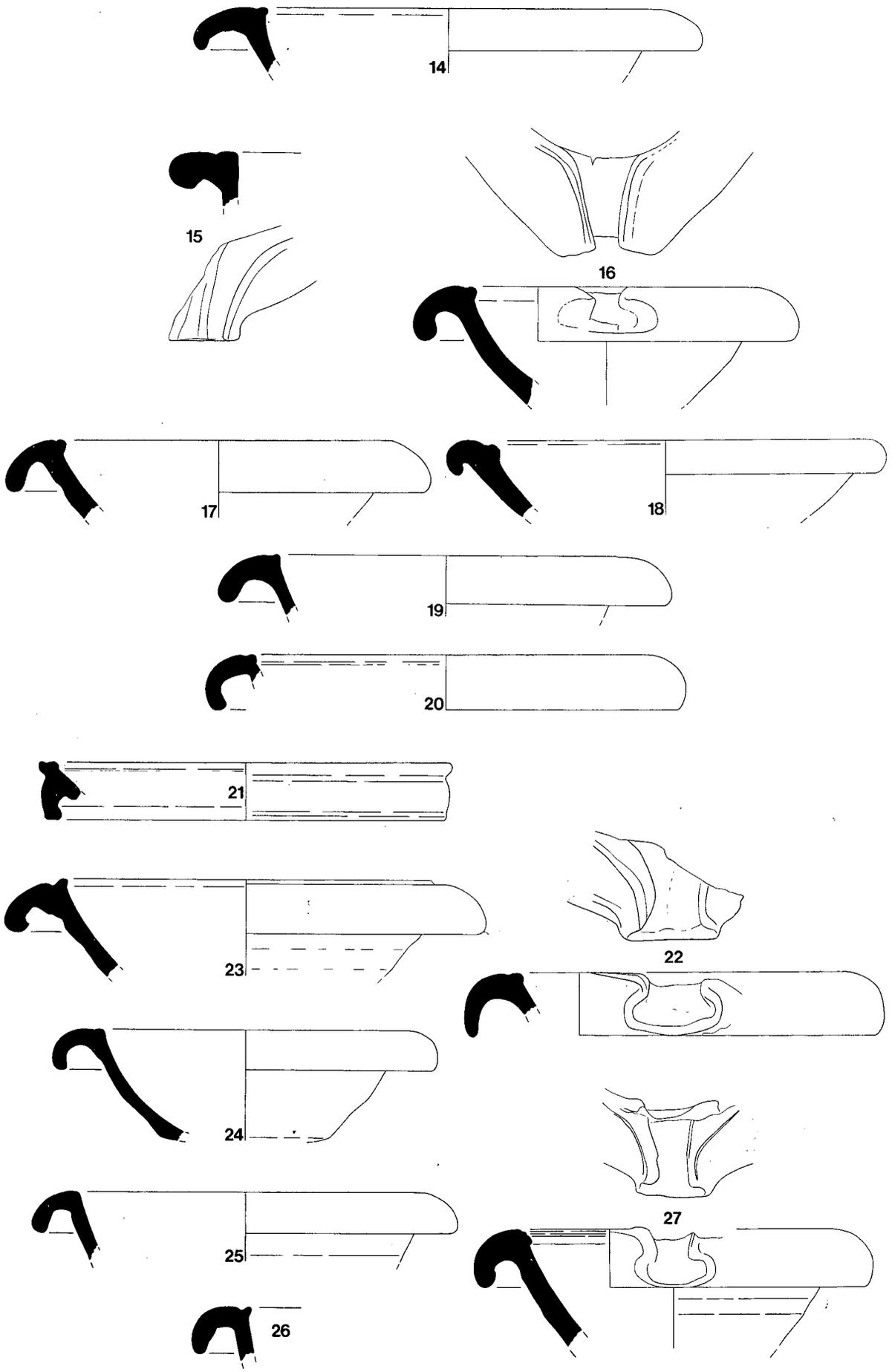


FIG. 113. Mortaria Nos 14-27 (1:4).

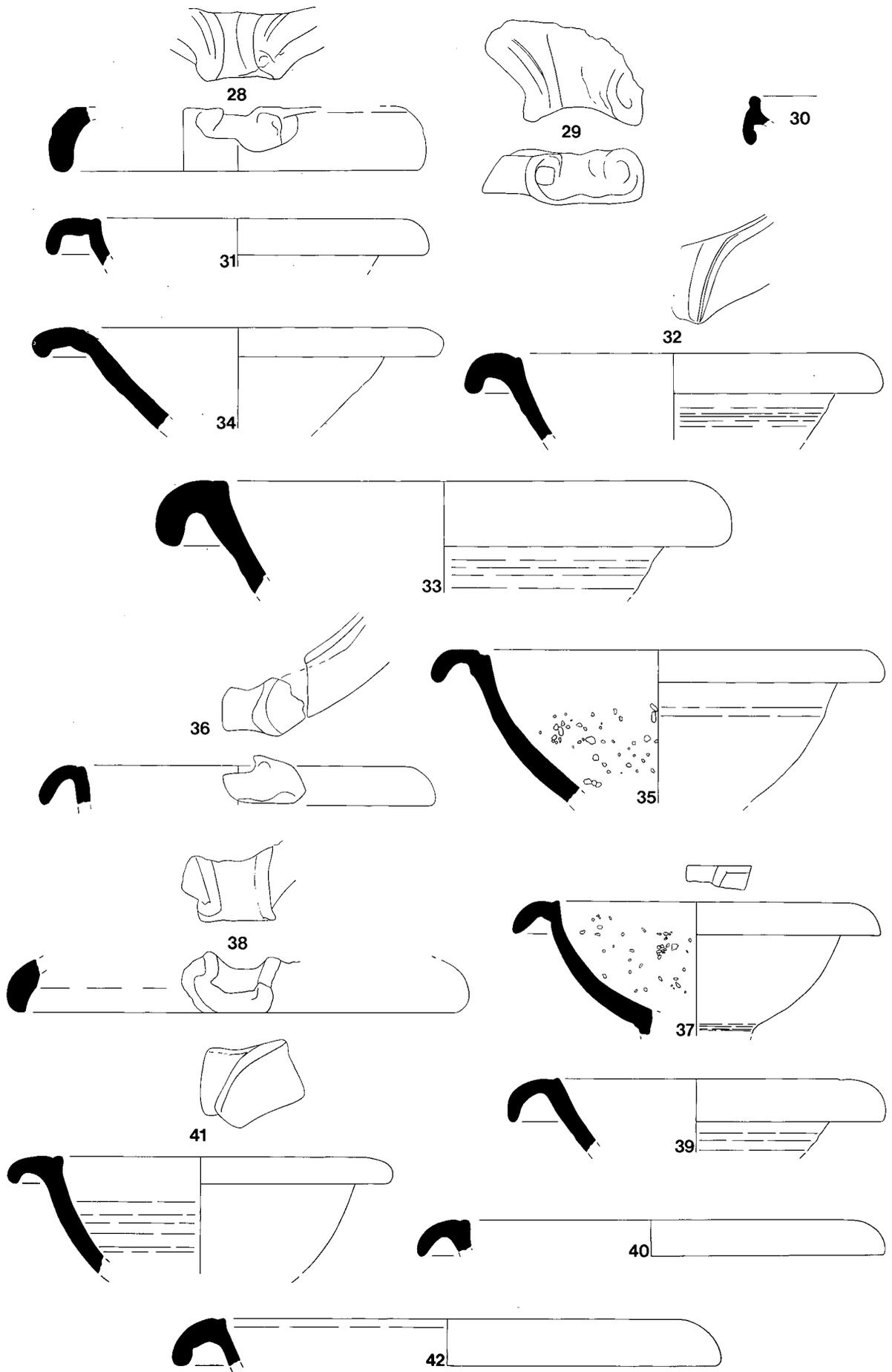


FIG. 114. Mortaria Nos 28-42 (1:4).

28. 69\265. Fabric B5.
29. 54\003. Fabric B5.
30. 57\006. Probably Fabric B1 but burnt through to black, Young (1977) Form M12. The kiln dating for this site is 180–240 but similar vessels come from Coygan Camp (Wainwright 1967, fig. 40, 16) from a group which can be dated to *c.* 270–300, a date which is perhaps more appropriate for the Loughor piece.
31. 57\088 (093). Fabric B8. A stamp of Doci – survives (Stamp No. 7). 100–60.
32. 57\409. Fabric B, spout of early type for this pottery, heavily worn. 100–40.
33. 53\1523; 53\1752; 53\1090. Fabric B5. A stamp of Sollus who worked *c.* 60–100 in the Verulamium region (Stamp No. 3). This worn example was probably made before 90.
34. 53\2024; 53\2027. Fabric B7, heavily burnt.
35. 53\3306; 53\514. Fabric B7, well worn. *c.* 90–120.

Group C fabrics

36. 55\121; 55\170. Fabric C3, with traces of a cream slip. 60–90.
37. 55\192. Fabric C4, no slip survives. This is an unusual mortarium: there are two neat, external grooves just above the base while the narrow beading used to delineate the spout is more common on spouted bowls than mortaria. Probably had part of a rivet-hole. Flavian.
38. 55\229. Fabric C3.
39. 55\255. Fabric C3.1.
40. 55\288; 55\275; 55\291; 55\159. Fabric C5, ?self-coloured slip, worn. Probably Trajanic.
41. 55\300; 55\159; 55\179. Fabric C3.1, some wear.
42. 55\471. Fabric C2. Similar in form to mortaria in Fabric B7 made by A Terentius Ripanus (see above No. 27). Flavian.
43. 69\008; 69\009. Fabric C2.
44. 69\009. Fabric C3.
45. 69\009. Fabric C3.
46. 57\060; 57\183. Fabric C3. Although this vessel differs in surface appearance from other vessels made at Loughor, its rather cindery feel and lightness are almost certainly a result of misfiring; there may also be some post-breakage burning. Heavy use of this vessel which has removed all the trituration grit indicates that this vessel was a second rather than a true waster. Probably Trajanic.
47. 57\166. Fabric C3.1, some grooves on outside of body.
48. 57\196. Fabric C3, thin, matt red-brown slip. Some broken scoring on interior near top. Well-worn. Probably early second century.
49. 53\125. Fabric C3. Low bead with flattish flange curling under at distal end. Body thick and base thick. A similar vessel is known from recent excavations at Cowbridge, South Glamorgan (Hartley forthcoming, no. 17).
50. 53\310. Fabric C2, no slip surviving. Probably Trajanic.
51. 53\594. Fabric C3, slightly burnt. Likely to be early second century.
52. 53\594. Fabric C3. Likely to be early second century.
53. 53\787; 55\290. Fabric C3.1, cream slip.
54. 53\821. Fabric C3, minimal bead, below shallow, only slightly curved flange.
55. 53\1139; 53\573. Possibly Fabric C3. The fairly fine-textured fabric has been burnt or overfired to very dark brown with blackish core and cannot be identified. There is, however, little doubt that it would have been produced in South Wales. The moderate inclusions included quartz and the trituration grit consisted mainly of quartz and sandstone. No sign of wear. *c.* 50–90.
56. 53\1538. Fabric C3.1, cream slip, worn. Flavian.
57. 53\2027. Fabric C3, self-coloured slip.
58. 53\2191. Fabric C3.1. Near to No. 46 in form but near vertical at distal end of flange.

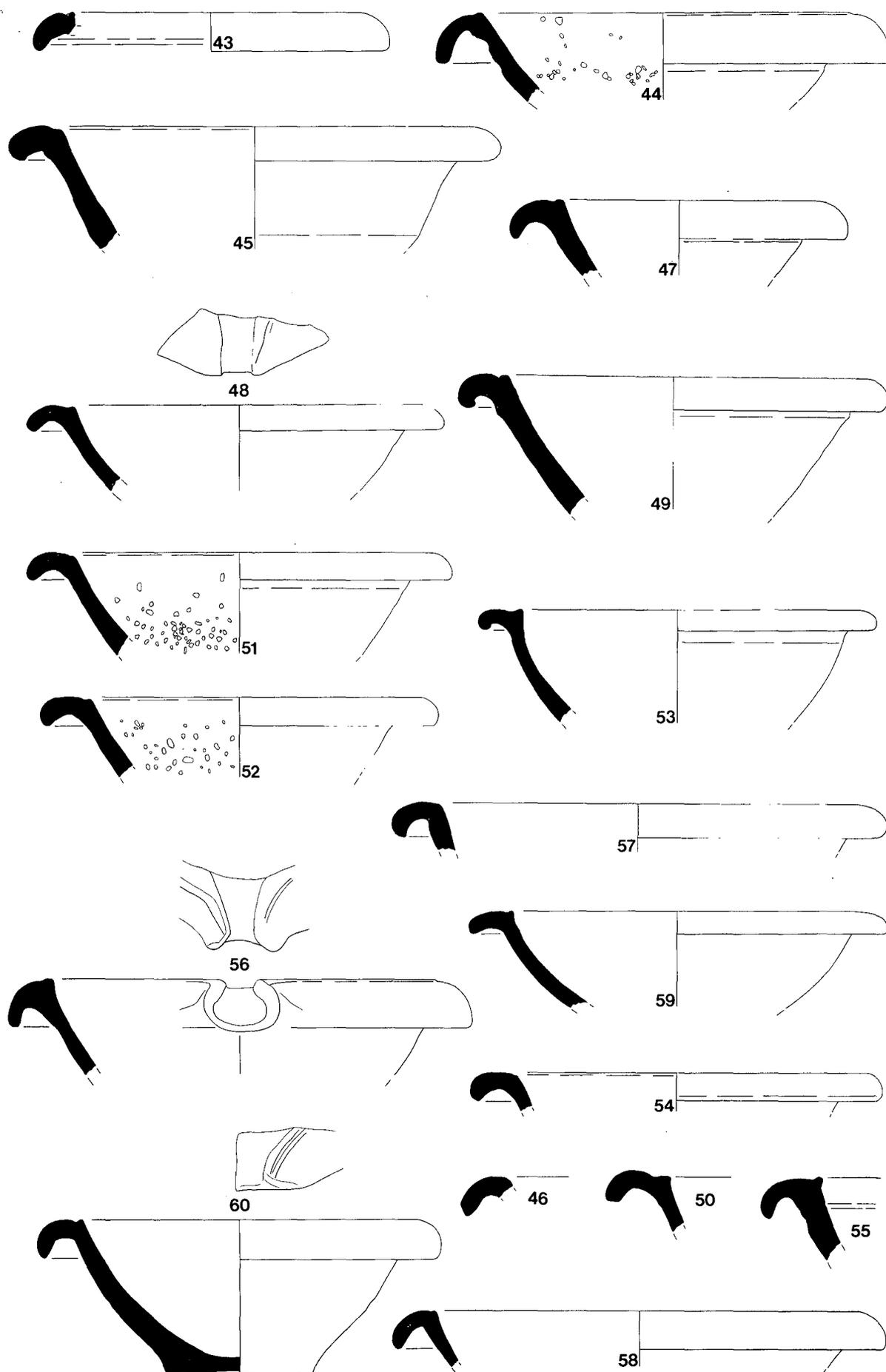


FIG. 115. Mortaria Nos 43-60 (1:4).

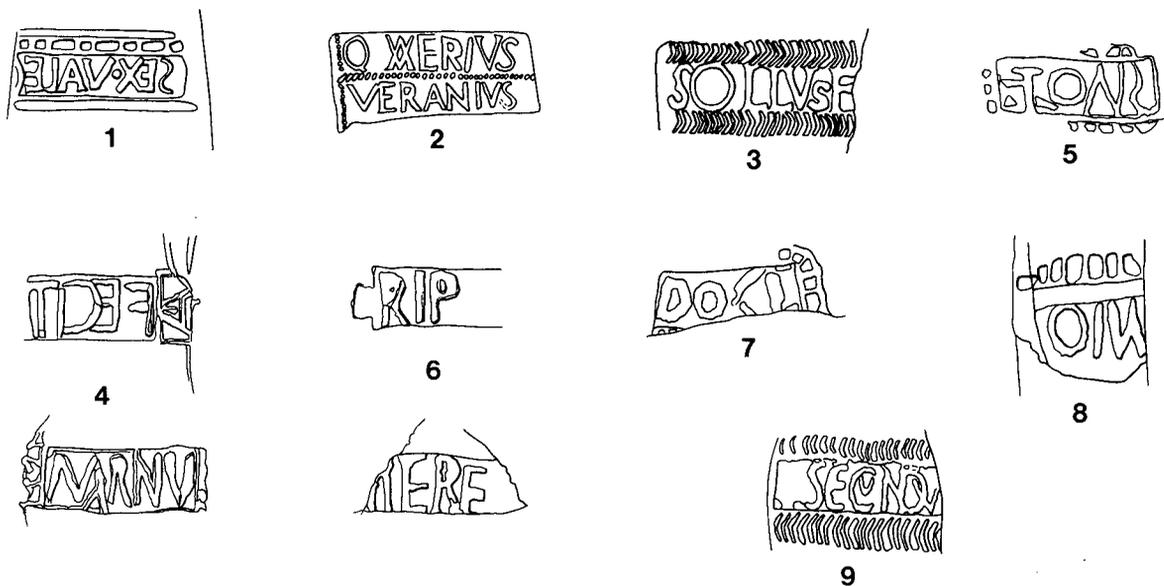


FIG. 116. Mortaria Stamps 1-9 (1:2).

59. 53\3047. Fabric C3, self-coloured slip.

60. 53\3179. Fabric C3. The surface has the appearance of having been 'peppered' with grit but weathering of the clay may have exaggerated the effect. Heavily worn and burnt. Flavian or Flavian-Trajanic.

Stamps

1. On No. 16.
2. On No. 13.
3. On No. 33.
4. On No. 24.
5. On No. 23.
6. On No. 27.
7. On No. 31.
8. 57\142 (179). Fabric B5. The fragmentary stamp is from the commonest die of Doinus who had a workshop at Brockley Hill. His activity lay within the period 70-110 and this, probably his latest die, could be 85-110. (For a complete impression of the stamp see Castle 1972, 77, fig. 5, d.)
9. 69\147 (120). Diameter *c.* 340 mm. Fabric B5. A well-worn broken stamp of Secundus survives. Secundus worked in the Verulamium region, probably at Brockley Hill. 55-85.

THE AMPHORAE (FIGS 117-120) By D. R. Evans

Introduction

The main significance of any group of amphorae is not just its dating potential, although unlike other ceramic objects its point of discard is often more closely controlled. Its value is in what it may tell us in general terms about the economics of a particular site. It is also a pointer towards consumption of certain items, although the nature of each particular site must be taken into consideration. The excavations at Loughor involved a number of separate areas (such separation is followed in the research archive) mostly around the edges of the fort and this factor may result in a bias towards the types of amphorae which are represented in this collection. The

preponderance, therefore, of Class 25 amphorae (Baetican olive-oil containers, Sealey 1985, 73) may owe much to the importance of this heavily-gritted fabric as hard core for the streets of the fort, unlike for instance, the more sandy fabric of Class 27. This is certainly the case on Site 57, where a considerable quantity of amphorae sherds were used as road make-up. Olive oil was certainly a major component of the military diet, but it also had functions other than as a comestible (see Sealey 1985, 145 for examples and references).

Before a general assessment of the collection is in order there are two vessels which deserve separate comment. The first (No. 54) is typologically a Tunisian amphora (petrology does not support or contradict such a source) which must be dated to the latter part of the third century on both site-dating and external evidence (Keay 1984, Type III). There are also two other vessels which are almost certainly of a similar date (see below).

The second vessel (No. 4), which comes from deposits overlaying the second phase of granaries on Site 53, is of a type which can be classified as Haltern 70 (see Sealey 1985, 59–64). Before this example was discovered the terminal date for the production of this type was established as the early fifties (Sealey 1985, 64), which can hardly be the case here. Haltern 70 amphorae have been claimed from Nijmegen in Flavian contexts (van der Werff 1984, 356) and from Lyon in contexts dating from the Civil Wars of c. 69 (Dangréaux and Desbat 1988, fig. 4 nos 1–9). Some of the vessels from Lyon (Dangréaux and Desbat 1988, fig. 4 nos 11–15) are clearly of a later but related type now known as London 555 (see Sealey & Tyers 1989 for the definition and development of this type) and the rest may be a derivative of the classic Haltern 70 (Fitzpatrick 1989, 25 and pers. comm.). The present vessel seems better related to Haltern 70 than to the derivatives of Haltern 70 or London 555. If Haltern 70 had contained wine the contradiction might be simply solved with this vessel having contained vintage wine; this was not the case, because the majority of Haltern 70s were used to ship a non-alcoholic syrup known as *defructum* (see van der Werff 1984, 381 for a discussion of the contents of this type) or other related items (Fitzpatrick 1989, 26), and these products almost certainly had a short shelf-life. Is it possible that this vessel (containing preserved olives (?), see Sealey and Tyers 1989) arrived very early at Loughor and was stored in the ‘granaries’ of both phases until they were replaced?

The typological development of Baetican olive-oil amphorae (Classes 25 & 26) is beginning to be more readily understood, and it is now possible to make general comments about the dating of these types (following Martin-Kilcher 1983); as might be expected the vessels from Loughor are, in the main, consistent with a date in the later first to early second century. Typologically the two earliest vessels are Nos 17 and 30, both of which would not be out of place in the Neronian period. A third vessel, however, (No. 19) would fit a mid- to late third-century date. Two other vessels, Nos 54 (see above) and No. 11, would also appear to date from this period.

Before considering the economic aspects of this collection two important points must be noted; first, that while in general the contents of amphorae are known there can be exceptions to this rule (Callender 1965, 39–41). Second, although amphorae are one way of transporting bulky liquid products, they are not by any means the only way, and it seems, therefore, that the market for certain products was captured by other methods of transport, perhaps wooden barrels (see Boon 1975, 55); although the quantitative evidence from London seems to show that barrels were imported side-by-side with amphorae and the decline in the importation of one was mirrored by the decline of the other (Wilmott 1982, 48–9), it is possible that some products were more readily transportable by barrel than amphora. It should also be pointed out that wine, unlike oil, could be stored for a considerable time before reaching the consumer. Although Petronius’ famous remarks about hundred-year-old vintage wine (*Satyricon* v.24–37) should be treated with some caution, many wine amphorae had their vintage indicated on their vessel (e.g. Yadin 1966, 169), and the recipe noted by Horace (*Satires* II.8.48) would certainly lose its effect if five-year-old wine were not available.

With the caveats above there can be little doubt that the Gaulish wine-producing areas (e.g. Class 27) had captured at least part of the British market well before the cessation of Italian amphorae production towards the end of the first century. It is accepted that Baetican olive-oil

amphorae were still being imported in the early third century, but the evidence noted above shows that production and stamping of this type (*contra* Keay 1984, 402–4, but note his reservations) had not ceased *c.* 257 but did continue, it would seem, to supply part of the British market until the later part of the third century.

Assuming that the group is to some extent representative of the proportions and types to be found generally at Loughor there can be little doubt that vessels carrying olive oil were in the majority (*c.* 40) with wine-carrying amphorae (10–12), mainly from Gaul, taking a poor second place. Amphorae used for the transport of fish sauce, or similar, occur occasionally, with perhaps as many as five vessels being present; even excepting a slight imbalance caused by the similarity of the body sherds of certain types it is difficult to increase this number substantially.

Although it cannot be expanded upon here at any length, the mere existence of amphorae on military sites raises questions of storage, consumption, and military contracts. Documentary evidence concerning consumption is restricted but an admittedly later source (Davies, R. W., 1971, 122) gives the daily allowance for each *miles* as two pints of wine and one-eighth of a pint of olive oil. It would seem that social expectation is unlikely to have varied these amounts by any great extent, so that they may be used for the whole Roman period. Even without a full calculation of amounts it can be seen how large an area may be set aside in any fort for the storage of liquid products.

The Loughor sample, although from a wide geographical area, is too small, as well as too widely spread chronologically, to go far in answering any questions concerning the exact mechanics of supply and distribution, or indeed redistribution. In the case of wine, however, there is the clear evidence for a change of supply area and with olive oil, although the number of vessels is small and the time limits so wide, there can be little doubt that supply was not restricted to one estate.

Although no vessels show evidence of secondary use, two have been drilled and in one of these the holes have been filled with lead. Such drilling is presumed to have been one method of tapping such unwieldy vessels.

It is worth mentioning the small discs in this collection which formed the seals for certain types of amphorae, a fact which was first recognised early in the nineteenth century (Leemans 1842, 90). They have been found in place in the Port-Vendras wreck (Colls *et al.* 1977, 38–40) and at Wroxeter (Atkinson 1942, fig. 43, A 14) but are often overlooked in pottery collections, for instance at the fortress baths, Caerleon (Greep 1986, 4.15–16 & 17, 104–15). They are useful indicators of amphorae being unstoppered in one place and disposed of elsewhere.

Archive

The full report is retained in the archive; representative examples by type are reported here.

Catalogue

Note: The amphorae have been classified as far as possible, according to the scheme of Peacock and Williams (1986).

Class 10 – ‘Italian’ wine amphorae

This form normally carried wine and was made in a wide variety of places. Before *c.* 55 vessels produced in Italy were the main types imported into Britain but after this date other suppliers such as Spain began production (Sealey 1985, table 10); unfortunately petrology shows little except small quartz grains and flecks of mica which give no clue as to its possible origin. Although production of this type continued until the mid-second century, the main thrust was over by the end of the first century (see Zevi 1966 and Panella 1973 for details of this dating).

1. 55\028. Rim.
2. 57\445. Handle.
3. 53\001. Handle.

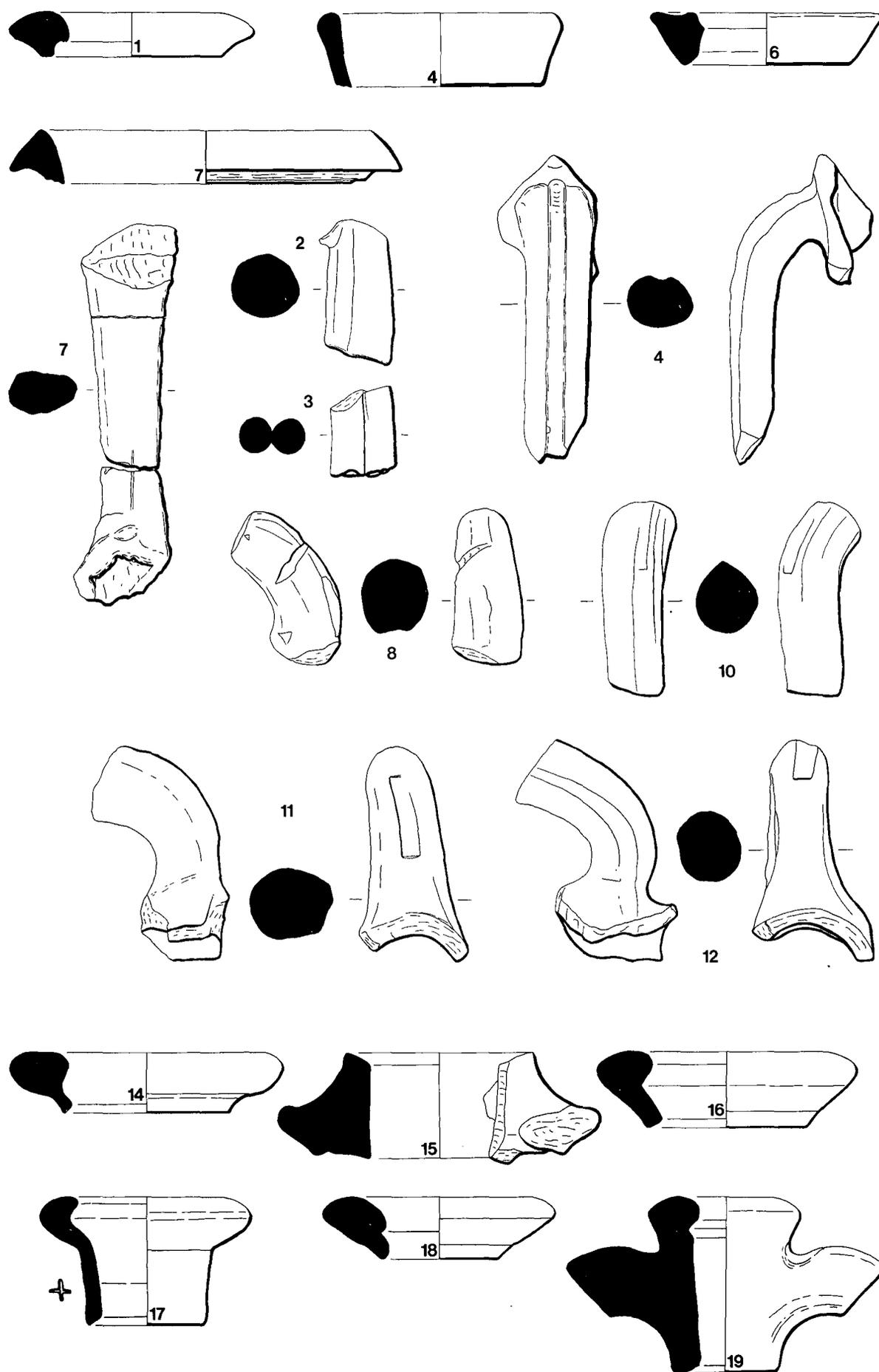


FIG. 117. Amphorae 1-4, 6-8, 10-12, 14-19 (1:4).

Class 15 – Haltern 70 or derivative

Non-product specific.

4. 53\1001, 1047 & 1381. Two rim sherds and handle.

Class 16D or E

5. 53\2034. Base. (Not illustrated)

Class 17

6. 69\223. Rim.

Class 18 – Beltrán IIA, Salazon

This type was produced along the Spanish coast and normally carried fish-based products or sometimes salted whole fish (Beltrán, 1970; Peacock 1974). Late first to early second century.

7. 53\821, 787 & 1422. Rim and handles.

Class 25

8. 55\043 (047). Stamp, C AR [(F or T) R]. On the right-hand handle. Similar to Callender (1965) no. 269, C CAR(istanii) FR(ontanis Fillior (or ex Figillinis)), a suffect consul of 90 or his son. They are known to have had estates in North Africa, but this vessel is of undoubted Baetican origin.
9. 55\179. Stamp. Only a fragment of the first letter survives, possibly R.
10. 57\088 (092). Stamp, L SERVI SINI (or SIMI). Retrograde; the second S was written incorrectly in the die. There is no parallel for this rather blurred stamp in Callender (1965). The latter part of the name is rather difficult to read but a transliteration of L SERVI(VS) SIM.(. . .) may not be too wide of the mark. Trinominati stamps are most common from the end of the reign of Claudius to the mid-second century.
11. 57\085 (161). Stamp, L.SPECV(L)AE (=diphthong)
[F] C [P] M.

Only the tops of the letters on the bottom line are preserved. On the right-hand handle, Callender (1965) no. 869, L(icini) SPECLAE (ex) F(igilinis) C(-) P(-) M(-). This form of lettering indicates that the vessel was not produced earlier than c.150, possibly between c. 193 and 235; stamping may have ceased c. 257. Although there is little corroborative evidence it is possible that this vessel was imported in the second half of the third century.

12. 57\247 (240). Stamp C ANN RFVN (the A and N are ligatured). On the right-hand handle, Callender (1965) no. 241, C ANN(I) RVF(I)N(I). A native of Arva in Baetica. Late first century.
13. 57\085. Stamp, C ANO QUE. Callender (1965) no. 243, C AN(T)O(nius) QU(I)E(tus). 70–120.
14. 55\179. Rim.
15. 55\179. Rim.
16. 55\300. Rim.
17. 69\364. Rim which has a small unequal-armed cross cut before firing, possibly a tally-mark.
18. 69\063. Rim.
19. 69\226. Rim/neck and handle.
20. 66\013. Rim.
21. 66\013. Rim.
22. 57\085 & 142. Rim neck and handles (includes Stamp No. 13 above).
23. 57\192. Rim.
24. 57\084. Rim.
25. 53\1047. Rim.

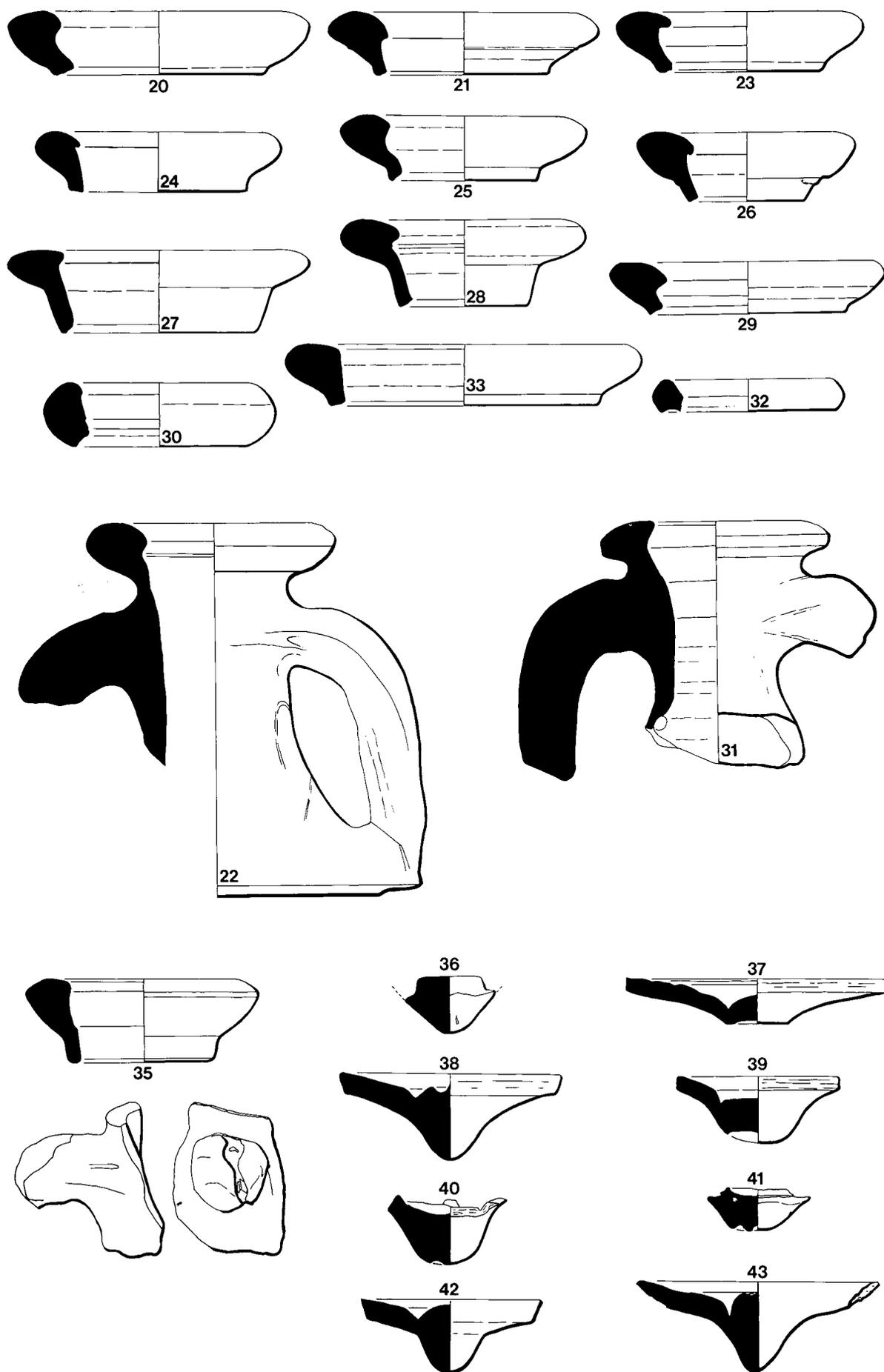


FIG. 118. Amphorae 20–33, 35–43 (1:4).

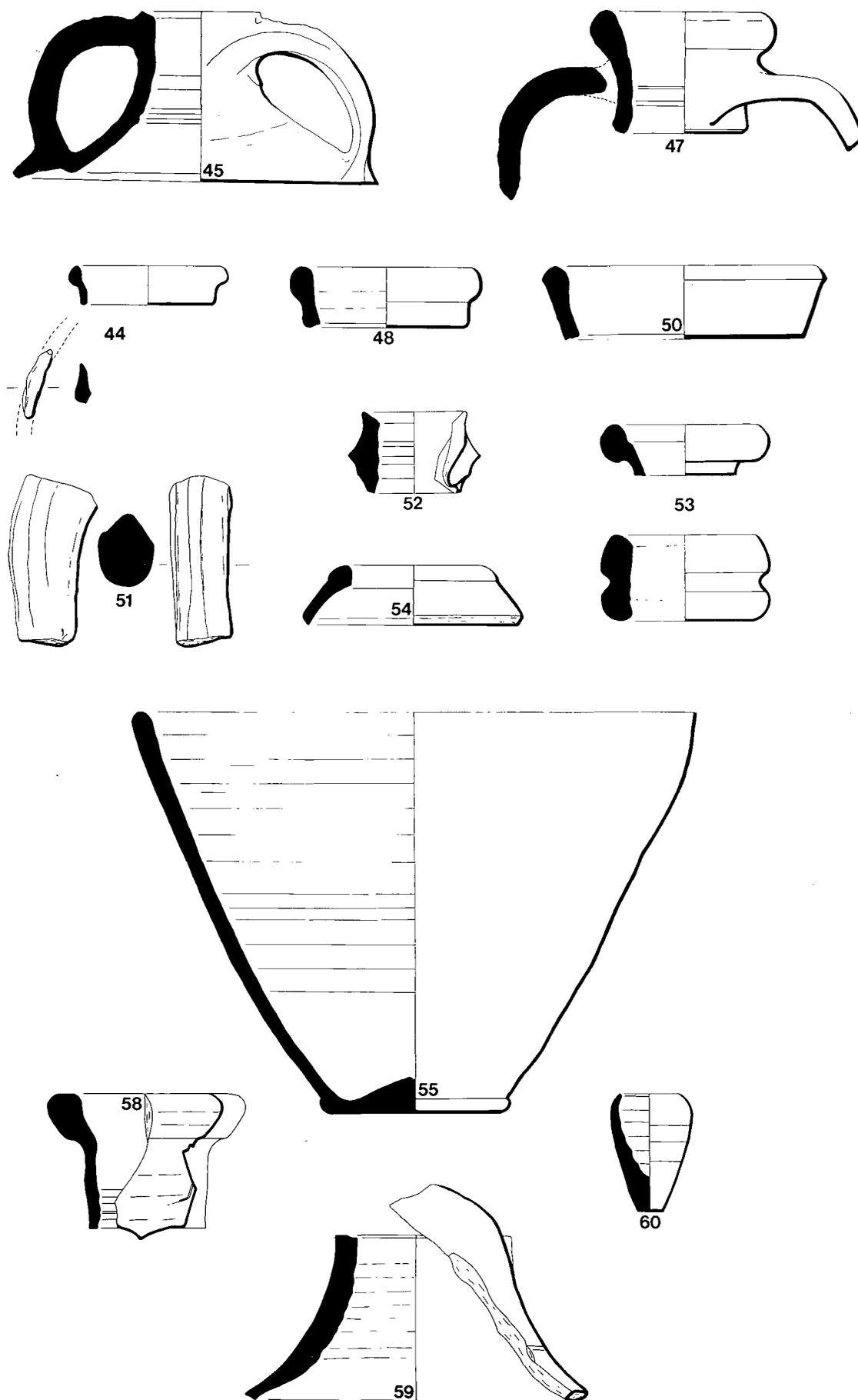


FIG. 119. Amphorae 44, 45, 47, 48, 50-55, 58-60 (1:4).

26. 53\822. Rim.
27. 53\586. Rim.
28. 53\1404. Rim.
29. 53\820. Rim.
30. 53\1369. Rim.
31. 53\996. Rim & handle.
32. 53\038. Rim.
33. 53\042. Rim.
34. 55\038. Handle. (Not illustrated)
35. 55\179. Handle/neck.
36. 55\063. Base.
37. 55\170. Base.
38. 54\034. Base.
39. 57\247. Base.
40. 57\352. Base.
41. 53\042. Base.
42. 53\042. Base.
43. 53\1256. Base.

Class 27 (or 28–31) – South Gaulish wine amphorae

44. 55\140. Rim.
45. 57\028. Rim, neck, and handles.
46. 57\089. Rim. (Not illustrated)
47. 53\1954. Rim, neck, and handles.
48. 53\865. Rim.
49. 53\3722. Rim. (Not illustrated)
50. 53\3167. Rim.
51. 55\137. Handle.
52. 69\150. Handle.
53. 69\003 & 187. Neck, body.
54. 55\255. Base.
55. 57\365. Base, body. Thin-sectioning shows frequent well-sorted quartz grains under 0.2 mm in size, some flecks of mica and a little chert. Gaulish amphorae show slight variations in fabric due to their production in a number of dispersed kiln sites (Laubenheimer 1985). Petrology is of little help in isolating the exact source of these vessels (indeed petrology alone cannot even isolate their main source) but neutron activation can be of some value (Laubenheimer *et al.* 1981).
56. 57\189. Base, although of somewhat smaller diameter than is usual with South Gaulish amphorae (cf. Sealey 1985 fig. 17 and No. 55 above); the fabric is not inconsistent with these types. (Not illustrated)

Class 30 – Gauloise 5

57. 55\064. Vessels of this class are less common in Britain than those of Class 27; they do however form the second largest group of Gaulish-produced amphorae in the early Flavian destruction deposit at Lyon (Dangréaux and Desbat 1988, 129–33, cf. especially fig. 10 no. 2).

Class 33 – Tunisian

58. 69\056. Rim. Petrological analysis gives no clue to the origin or form of this vessel.

Unclassified A

59. 57\128. Neck. Hard, rough, sandy fabric with lightish buff surfaces and a red core. Thin-sectioning shows a scatter of grains of quartz, some plagioclase and potash feldspar,

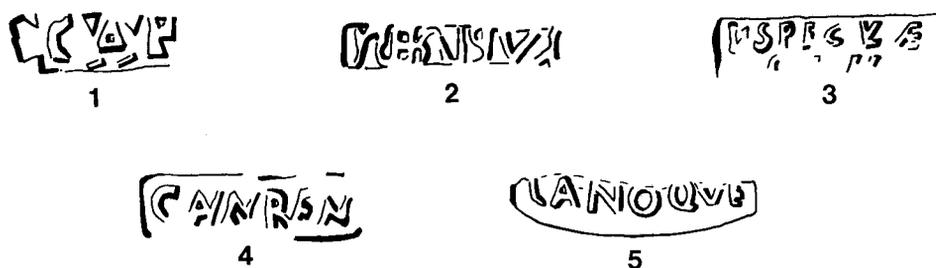


FIG. 120. Amphorae Stamps 1–5 (1:2).

argillaceous material and flecks of mica. Source unknown. The form of the vessel gives no clues as to the form or possible origin.

Stopper

60. 53\2237. The 'lower' part of an amphora stopper in a slightly sandy pink fabric with a cream surface. Although somewhat finer the fabric is very near to that of Class 17/18 Southern Spanish Salazon amphorae. Unlike the disc seals noted above, stoppers of this type are rarely reported from excavations (possibly because they have gone unrecognised). There is, however, a good collection from Pannonia (Bezeczky 1981, fig. 36). No examples of such stoppers in position on the neck of an amphora have been fully published (but note the claims of Benoit, 1952). Almost all of these examples are broken but it would appear that there are two basic types; Type A (as our example) is closed (apart from a single pierced hole) and is represented by Bezeczky Nos 424, 425, 437 for example, Type B is open-mouthed and, in broken examples, could be recognised by a slight out-curve just before the rim; this type is represented by Bezeckzy Nos 421–3. In some cases, as for example Nos 435 and 440, it is not possible to be certain about this type. It is possible that certain of the Type B examples could be used as unguent bottles, Type A clearly could not be so used.¹⁰

Seals and tapping-holes

Eleven small discs that formed seals for certain types of amphorae (see commentary above) – eight from Site 57, two from Site 53, and one each from Sites 55 and 69 – were recovered; one vessel from Site 57 also contained a tapping-hole. Full details are retained in the archive report.

Stamps

1. On No. 8.
2. On No. 10.
3. On No. 11.
4. On No. 12.
5. On No. 13.

THE COARSE POTTERY (FIGS 121–137) By P. V. Webster

Introduction

The Loughor excavations of 1982–84 and 1987–88 yielded fragments of an estimated 1,564 Roman coarse pottery vessels (excluding mortaria). This figure excludes some vessels lost in a fire at the Trust headquarters. The latter would have increased the total, but preliminary examination, before the fire, suggests that it would not have appreciably altered the picture presented here.

Most vessels found were from the earlier fort, the date of which is suggested as 75–115/125,

and most, as will be seen, are from local kilns. In this situation, the total publication of all vessels found would not only be impractical but would also be very repetitious. The pottery report is, therefore, divided into two parts, an archive and a published catalogue.

The archive report

This consists of an attempt to list all coarse pottery vessels found on the excavations and available for examination in 1988. It is divided by site, phase, and context and all vessels thought likely to contribute to the chronology of ceramic history of the site are individually catalogued. This total list forms the basis for all comments and tables in the report below.

The published catalogue

This is an edited version of the archive report. This aims to catalogue individually a sufficient number of vessels to allow us to get a good overview of the ceramic assemblage and to verify any conclusions of a chronological, economic, or social nature. Beyond this, certain aspects of the collection are represented in summary and tabular form only.

The mortaria and amphorae have been treated separately (see D. R. Evans and D. R. Evans & K. F. Hartley above). Of the remaining coarse pottery, we may draw together here some general comments on the collection as a whole.

Sources

Within the catalogue for each site below there will be found a summary table of pottery by phase and source. This information can be summarised for the site as a whole by period as follows:

TABLE 14. LOUGHOR: ALL SITES: ANALYSIS OF COARSE POTTERY BY FABRIC SOURCE

PERIOD	I	II	III	IV	V	VI	VII	VIII	IX	TOTAL	%age
Fabric <i>a</i>	10	8	36	33	15	34	56	16	46	254	16
Fabric <i>b</i>	3	8	13	8	15	25	18	10	31	131	8
Fabric <i>c</i>	—	3	18	9	22	39	125	28	104	348	22
Other oxidised	19	11	36	14	23	28	30	11	40	212	14
Other reduced	17	13	28	30	42	40	70	23	117	380	24
BBI	2	—	5	6	8	15	31	12	70	149	10
'Malvern'	—	—	—	—	—	1	1	1	2	5	—
Caerleon	—	—	—	—	1	1	1	—	5	8	1
Severn Valley	—	1	2	1	—	4	—	—	—	8	1
Verulamium	—	—	—	1	—	2	—	—	1	4	—
'Terra Nigra'	2	—	—	—	—	—	1	—	1	4	—
Lyon cc	—	—	—	—	2	1	3	—	3	9	1
Early CG	—	—	—	—	—	—	1	—	—	1	—
Argonne cc	—	—	—	1	1	2	4	1	2	11	1
Köln/Nene Valley cc	1	1	—	2	2	1	7	3	7	24	2
Late CG cc	—	—	—	—	—	—	1	—	1	2	—
Mosel cc	—	—	—	—	—	—	—	—	2	2	—
Oxford cc	—	—	—	—	—	—	—	2	6	8	1
New Forest	—	—	—	—	—	—	—	—	2	2	—
Gr. Glaze	—	—	—	—	—	—	—	—	—	1	—
Eggshell	—	—	—	—	—	1	—	—	—	1	—
TOTAL	54	45	138	105	131	195	349	107	440	1,564	101
%age	3	3	9	7	8	13	22	7	28	100	

The periods referred to in TABLE 14 are for the site as a whole as outlined in the summary in Chapter 4 (above), with the exception of Period IX, which title has been given to all post-fort phases along with unphased contexts. Where a site phase continues across more than one period, it is counted with the earliest of those periods. Site 54, Phase 1 is counted as Period IV.

The sources from which Loughor drew its pottery were as follows:

(i) Local sources (Fabrics *a-c*)

Fabric *a* generally appears as a light grey fabric with sparse sandy inclusions and a surface which is often darker than the body. Local soil conditions tend to render it soft and powdery. It is assumed to be a fabric which was manufactured within a short distance of the Loughor fort. Although not present among the very few vessels from absolutely primary levels (i.e. those associated with site clearance), it is found from Period I onwards. It is clear that many of the vessels in this fabric from later periods are residual. The date when this fabric ceased to be manufactured will be considered below, after the closely allied Fabric *b*.

Fabric *b* is an oxidised version of Fabric *a* and there seems no reason to suppose that the two were not made by the same potters and at the same time. Fabric *b* was, however, noticeably less popular than Fabric *a* and, assuming that survival in the excavated record reflects the pattern of initial production, it would appear that almost twice as many vessels were produced in *a* as in *b*.

There seems no doubt that Fabrics *a* and *b* were both in production early in the history of the Loughor fort and within Period I. With so much residual material in later levels, it is more difficult to decide when production ceased. However, if we look at the information in TABLE 14 in terms of percentages, we find that in Period I, Fabrics *a* and *b* make up 24 per cent of the total assemblage for that period. For other periods the percentages are as follows: Period II, 35 per cent; Period III, 36 per cent; Period IV, 39 per cent; Period V, 22 per cent; Period VI, 30 per cent; Period VII, 21 per cent; Period VIII, 24 per cent; Period IX, 18 per cent. On typological grounds, we can regard vessels in Periods VIII and IX as residual and it seems likely, in view of the overall dating (see below) and the relatively low percentage of vessels present, that those in Period VII are also residual. On the present evidence, however, there seems no reason to suppose that the two fabrics were not in production through all of Periods I–IV, and perhaps also in Periods V and VI.

Fabric *c* is a light sandy fabric containing plentiful small sandy grits. The general fabric type is found throughout South-East Wales and is often referred to as *South Wales Grey Ware*. The general fabric group is discussed most recently in Webster (1993), where a regional type series is outlined.

At Loughor, the fabric is present in only very small quantities in Period II and in none of the very earliest phases. It would seem, therefore, that the fabric makes its first appearance in the early to mid-80s. As a fabric found throughout South-East Wales, Fabric *c* need not have been made in the immediate vicinity of the fort and there is no certainty that several kilns are not represented as it appears in all periods. The quantities in later periods (21 per cent of all vessels in Period VI, 36 per cent in Period VII, 26 per cent in Period VIII) show it to have been an important source from the second century onwards.

(ii) Other oxidised and reduced fabrics

As the title suggests, several fabrics are represented under this heading. Not all will have been local, but it is likely that at least some of the fabrics grouped together thus are indeed from the local region. A glance at TABLE 14 shows that this merely emphasises the importance of local sources in the supply of pottery to Loughor.

(iii) Black-burnished ware, Category 1 (BB1)

The appearance of BB1 on military sites in South Wales from the Neronian period onwards is discussed elsewhere (Webster 1993, 265). Loughor follows the pattern for forts on the coastal strip. The ware is present in small quantities from Period I. Remarkably, however, it never forms the major component of the assemblage in any period. This can be seen most clearly by looking at the ware as a percentage of the total vessels from each period. BB1 represents 4 per cent of Period I vessels, 4 per cent of Period III, 6 per cent of Period IV, 8 per cent of Period VI, 9 per cent of Period VII, 11 per cent of Period VIII, and 16 per cent of the largely post-Roman Period IX. If we contrast these figures with those for key groups of second- to fourth-century date at Usk (Webster 1993, 354–5), we find that the Usk groups contain between 22 per cent and 43 per cent BB1, a very great deal more than those at Loughor. It seems more likely that

we should look for a chronological reason for this, rather than for one connected with local market conditions and this point will be examined more fully below.

(iv) 'Malvern' jars

The title has been given to a class of vessel in dark grey or dark brown fabric containing plentiful angular stone and showing clear signs of manufacture without the aid of the potters' wheel. The type is identified as a product of the Malvern area by Peacock (1957), although some other sources may be present (Tomber in Wilmott & Rahtz 1979). Vessels of this type are found in small quantity throughout Wales. Although they could be used for cooking (as sooting on their exteriors often demonstrates), they seem unlikely to have been marketed for this purpose. Their wide, but sparse, distribution suggests a vessel made as a container, perhaps for a widely distributed commodity such as salt.

(v) Caerleon ware

Caerleon ware, as the name implies, originated in or near Caerleon. It is an oxidised fabric with orange-red colour coat (for a fuller summary see Webster 1993, 255–63). The ware is found in small quantities in South Wales and in South-West England. Examples at Loughor are mainly of roughcast beakers, but the main interest lies in the small number of fragments found and in the single vessel from Period V, both chronological matters to be dealt with below.

(vi) Severn Valley ware

The ware is discussed in Webster (1976; 1993, 255–63). The proximity of South Wales to the Severn Valley makes it inevitable that some characteristic products found their way into our region. Here we need only remark that Severn Valley ware is found at Loughor only in Periods II–VI and that it is present in extremely small quantities.

(vii) Verulamium

The characteristic white-buff granular fabric of mortaria from the Verulamium region is well-known (cf. Evans & Hartley above). Vessels listed under the heading 'Verulamium' are in a similar fabric and from similar sources. They, no doubt, represent no more than an occasional 'make-weight' inserted into consignments of Verulamium mortaria marketed in South Wales in the Flavian-Trajanic period.

(viii) Terra Nigra

The term 'terra nigra' is used in this report in the same way as in the series of reports on the Usk pottery (see Greene 1979, 106–27) and it seems possible that the source in central-western France proposed there (Greene 1979, 108) is that also of the Loughor pieces. It seems likely that the ware reached the site only in Period I and that the later examples (Periods VIII and IX) are residual.

(ix) Lyon colour-coated ware

The ware is discussed by Greene (1979, 13–42) in the context of the Usk assemblage. Greene suggests manufacture up to 70. Unfortunately the entirely pre-Flavian character of his distribution (Greene 1979, 16 fig. 4) can no longer be sustained. Loughor is not alone among Flavian foundations in yielding examples of Lyon ware. Carmarthen, Segontium, and Carlisle should be added to the list of sites. However, occurrences on Flavian sites appear always to be in very small quantities and, in this, Loughor is no exception. Therefore, *pace* Grataloup (1988), it seems best to see this as the survival in use of vessels made earlier and to confirm the essentially pre-Flavian character of Lyon ware. If this is true, the Loughor vessels from Periods V–VII are most likely to have reached the site early in its history and to be residual as found.

(x) Early Central Gaulish colour-coated fabric

The term is used to denote a fabric identified by Greene (1979, 43–9). It is represented by a single vessel at Loughor. Although pre-Flavian examples certainly exist, the ware continued into

the Flavian period and later. A single example such as ours can add little information on a somewhat insecurely dated fabric.

(xi) Argonne colour-coated fabric

This is Anderson's 'North Gaulish' colour-coated fabric (1981, 321–48). The ware is discussed in a local context in Webster (1993, 295–6). The definition of the source as being in the Argonne follows the work of Blaszkiewicz and Dufornier (1989) and Symonds (1990). The ware is relatively scarce in South Wales, perhaps due to competition from the broadly similar Caerleon roughcast beakers. At Loughor it appears in small quantities from Period IV onwards.

(xii) Köln or Nene Valley colour-coated fabrics

In recent years it has been recognised that the colour-coated white ware long associated with Castor in the Nene Valley, can have its origin either in the lower Nene Valley or in Köln (cf. Webster 1993, 296–305, for a summary and for the forms most commonly found in South Wales). Loughor appears to have been receiving beakers in colour-coated white ware from Period I onwards. All those from Period I–VI are likely to have been from Köln. It is a surprising point, which may not be without chronological significance (*qv*) that this is the most prolific colour-coated fabric at Loughor.

(xiii) Other colour-coated fabrics

Other sources of colour-coated ware are represented by only fourteen vessels at Loughor. These are divided between four sources. The term Late Central Gaulish colour-coated ware has been used to denote the characteristic later second- to mid-third-century products of Lezoux (cf. Webster 1993, 305–8; Symonds 1993), which, with Mosel colour-coated ware (Webster 1993, 309–10; Symonds 1993), were long grouped under the title 'Rhenish ware'. Both appear at Loughor in minute quantities and in later periods, of which only the single example of late Central Gaulish colour-coated ware from Period VII may be other than residual.

The products of the Oxford kilns are noticeable by their absence. All examples are in red colour-coated fabric, the production of which did not start before the mid-third century (cf. Young 1976). There are two examples in Period VIII and it seems reasonable to suppose that the six examples from Period IX also date from the time of the latest fort occupation. This is, however, a very small number of vessels when compared with the overall assemblage.

There are only two vessels from the New Forest colour-coated industry, but in view of the overall distribution of the ware (Fulford 1975) this is not surprising. South Wales lies on the very fringe of New Forest ware distribution and, when we consider the very low numbers of later pieces from Loughor, it is surprising that any New Forest products are represented.

(xiv) Eggshell and green-glazed wares

These are represented by only two vessels, both from Period VI. Both wares are present at Caerleon in the late first or early second century (cf. Webster 1993, 264 and 315–16 for a discussion in a local context). The green-glazed ware was probably made at or near Caerleon. The situation in the case of the eggshell ware is less clear.

Chronology

The relatively compressed chronology of the site means that the coarse pottery can add less to the overall site chronology than one would hope. The great majority of the coarse pottery from all periods is Flavian and Trajanic and, as yet, we cannot differentiate sufficiently within this period to enable us to refine dating of the earlier Loughor periods. Overall, however, some points may be made.

A look at TABLE 14 reinforces the statement already made about the Flavian and Trajanic character of the assemblage. The small amount of later ware, both in absolute terms and in terms of percentages of the whole, is very apparent. Late colour-coated wares such as those from Oxford are poorly represented. Even Black-burnished ware, as has already been noted

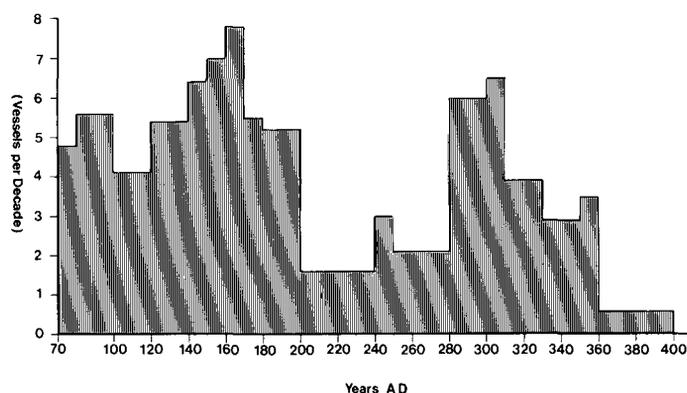


FIG. 121. The chronological distribution of samian ware at Loughor.

above, forms a smaller part of the assemblage than one would expect. It seems unlikely that there are some localised market conditions to explain this scarcity and the most probable explanation lies in the overall chronology. It seems probable that the main fort occupation ceased before the great expansion of the BB1 market in the Hadrianic-Antonine period and that later occupation was either on a very reduced scale or for a very short-lived period.

A check on this general thesis may be obtained by summarising the published samian chronology (Dickinson above) in histogram form (FIG. 121).

The method used to construct the histogram is explained in connection with that for the Black-burnished ware below. The samian histogram shows very clearly that samian with a *floruit* c. 70–85/90 was by far the most frequent samian find. It also shows fairly clearly that samian from the period after c. 120 is comparatively rare. This accords with a low level of activity on the site but would not preclude some short-lived military re-occupation.

If we are to extend our survey of the evidence beyond the end of the second century, then we need to look at the more diagnostic non-samian pottery. The general lack of late colour-coated wares has already been commented upon and could be indicative of either a reduced level of occupation or of short-lived later periods of occupation. The Black-burnished ware is, however, more explicit. Of the 149 vessels represented, it is possible to provide dating, if sometimes of a rather generalised sort, for 125. If we count each vessel as a unit and divide that unit evenly between the decades of its date range (so that a vessel dated 120–160 would count as 0.25 in each decade) we can achieve a histogram showing the approximate number of vessels ascribable to each decade (FIG. 122).

The histogram should be compared with that for the Caerleon Fortress Baths prepared by Greep (1986b, 57). It must be noted that the latter is based on percentages within groups, so that some comparison must be made with the percentage figures given above. The Loughor histogram shows a reasonably constant number of vessels present from the foundation of the fort up to c. 200. There is a slight peak in the mid-second century, but nowhere as great as one would expect (for instance, from the Caerleon picture) as this is the period when BBI came to dominate the kitchen wares of our area. The small number of vessels dated c. 200–280 is of interest as is the sudden late third- to early fourth-century rise in numbers. Taken with the low overall numbers of BB1 vessels, this could be taken to indicate short-lived activity in the later second century and in the late third to early fourth century but with very much reduced occupation over much of the third century and in the fourth century. Turning to the wider picture, the general dearth of colour-coated wares might be taken to confirm low third-century activity and the absence of calcite-gritted wares from east central England (cf. Webster 1993, 294–5) suggests little or no activity in the later fourth century.

Comments on the dating of specific phases will be found in the catalogue below. Here a few general points may be made on the dating of individual periods.

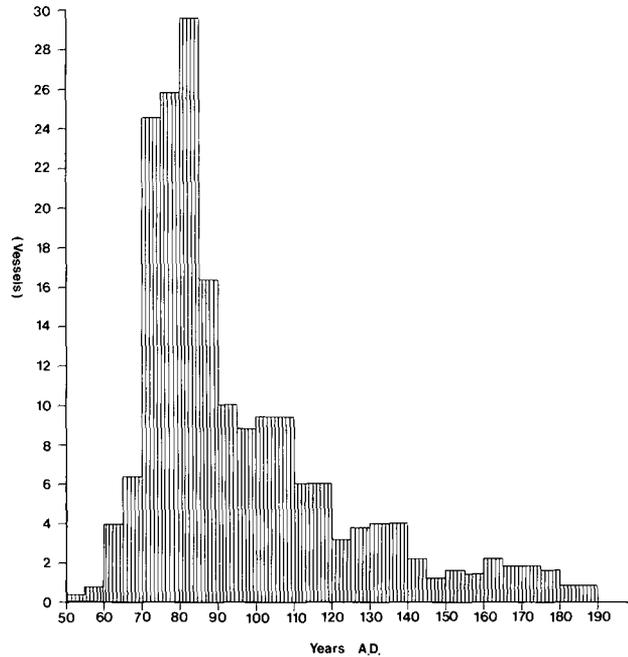


FIG. 122. The chronological distribution of Black-burnished ware at Loughor.

There is little in the coarse pottery to support a foundation date earlier than the traditional one *c.* 75, but Periods I–VI appear to be pre-Hadrianic and it would seem perverse to compress these phases into less than the 40 to 50 years *c.* 75–115/125. The dating of Period VII presents more of a problem. One feels that a prolonged Hadrianic or indeed a sustained Antonine occupation would have generated more Black-burnished ware than we see here. The quantity of Caerleon ware also seems insufficient for a prolonged occupation in the Hadrianic or Hadrianic-Antonine period. There are, in addition, a number of pieces in the Period VII levels which cannot be earlier than the later second century (Nos 91, 101, 102, 238, 240, 608, 621). If we are not to dismiss these as intrusive, and they seem too many for this, then we must surely think of Period VII as short-lived and possibly later second century.

There would appear to be structural evidence for a break between Periods VII and VIII and this would certainly accord with the ceramic picture. The presence, albeit in small amounts, of Oxfordshire colour-coated ware, places the period later than *c.* 240, while the Black-burnished ware includes pieces which must be late third or early fourth century in date. A late third-century re-occupation would be commensurate with the coarse pottery evidence. The presence of some vessels from Periods VIII and IX which are likely to date up to the mid-fourth century, suggest activity at least to this time. However, it must be emphasised that, like all activity later than Period VI, this would have been on a scale much reduced from that of the fort in its first- to early second-century heyday.

It is a truism that ultimately it is sites that date pots and not pots which date sites. With this in mind it is worth asking ourselves if the Loughor assemblage can tell us anything of general interest to pottery as a whole. It does seem to have a general message concerning residual pottery. As already stated, it is highly unlikely that Fabrics *a* and *b* were made after Period VI, but they form a remarkably high proportion of vessels in later periods. This is a pattern which one would expect on a site occupied intensely in an early period and only spasmodically later, but one rarely sees it shown so clearly.

Residuality obviously plays an important part in all Loughor assemblages, but it is worth looking at the Flavian and Trajanic material, within the framework of the first six periods, to see if any typological developments of general interest can be discerned. Any suggestions must be very tentative, but it does look as if some change in the prevalent jar rims can be seen. Among jars from early phases, everted rims or rims with short upright necks seem to predominate. In

later phases (i.e. Periods IV–VI) there appear to be fewer everted-rimmed jars and more with gently curving rims. In Period VI particularly there are a number of vessels, the neck and rim of which seem to show some influence from Black-burnished ware. Among flanged bowls, the pattern is less discernible, although one does wonder if there is a tendency to move away from angular, carinated vessels, towards more rounded profiles.

Overall, however, one must return to the total dominance of Flavian and Trajanic types. Looking at the collection as a whole, it seems highly improbable that there is much prolonged or intense activity on any of the excavated sites outside the period *c.* 75–125. That there was some occupation between the early/mid-second century and the mid-fourth century is apparent, but the material would suit activity which was spasmodic and not particularly intensive.

Social and economic implications

The list of sources for 'coarse' pottery reaching Loughor demonstrates clearly the far-flung nature of Roman ceramic trade. To these sources need to be added those indicated in the reports on the samian and mortaria. The majority of the coarse pottery is, however, from local sources (i.e. within South-East Wales) and it is probable that a good deal of this (including all vessels in Fabrics *a* and *b*) is from the immediate vicinity of the fort. The presence of local kilns is reinforced by the presence of a few wasters or 'seconds' (Nos 203, 295, 333, 565), a category of vessel thought rarely to have travelled far from its place of manufacture.

In its local focus, the Loughor ceramics reflect a feature of Flavian and Trajanic pottery, as this appears to have been a period of small local kilns, rather than large centres of manufacture. If we had much later pottery, the picture would, undoubtedly, have been different.

In an attempt to find out the purposes for which pottery was employed on the site, a functional analysis of all pottery was attempted. Individual tables for each site will be found in the appropriate introductions; these have been added together and summarised by period in TABLE 15 below.

TABLE 15. LOUGHOR: ALL SITES: ANALYSIS OF COARSE POTTERY BY FORM AND FUNCTION

PERIOD	I	II	III	IV	V	VI	VII	VIII	IX	TOTAL	%age
KITCHEN WARE											
Jar	28	25	69	43	55	106	196	59	257	838	54
Bowl	9	6	25	18	24	27	62	26	82	279	18
Dish	1	2	9	7	7	13	15	–	17	71	5
Lid	3	3	11	18	23	16	30	9	24	137	9
Cheese-press	1	–	3	2	4	2	–	–	1	13	1
Colander etc.	–	–	–	–	1	–	–	–	1	2	–
TABLE WARE											
Flagon/jug	7	4	8	5	5	14	8	6	10	67	4
Beaker	1	2	1	5	8	6	18	4	25	70	4
Tankard/mug	–	–	2	1	1	2	2	–	4	12	1
Jar	2	–	2	1	2	2	1	–	–	10	–
Bowl	1	2	3	4	–	5	15	3	18	51	3
Dish	1	–	2	1	–	–	1	–	1	6	–
OTHER											
Tazza	–	–	1	–	1	2	1	–	–	5	–
Lamp	–	1	1	–	–	–	–	–	–	2	–
Triple Vase	–	–	1	–	–	–	–	–	–	1	–
TOTAL	54	45	138	105	131	195	349	107	440	1,564	99
%age	3	3	9	7	8	13	22	7	28	100	

Compilation of the table has required some element of personal judgement. It cannot be demonstrated that all everted-rimmed jars, for instance, were for use in the kitchen, but this has been assumed unless there is evidence to the contrary (e.g. mica-dusting to produce a highly decorative finish). We have probably erred somewhat towards a preference for kitchen use in the analysis of jars, bowls, and dishes. Nevertheless, the pattern seems very clear. The inhabitants

of Loughor used their pottery primarily in the kitchen (or for culinary purposes). The low percentages of jugs and drinking vessels bears out the general dearth of tableware.

It is also clear that there is a general absence of vessels with specific function. There are so few cheese-presses, for instance, that one can be reasonably certain either that little cheese was made on site, or, less probably, that presses were in some other material. One can reasonably surmise an organisation concerned to feed itself, but not with the mechanics of turning agricultural products into food.

Tazzas are also notable mainly by their absence. This will occasion little surprise among those who have examined other collections from auxiliary forts. The tazza does, however, seem to be more numerous at Caerleon, both in the fortress and the civil settlement. Can it be that we have here a particularly 'legionary' vessel?

Looked at as a whole, the collection seems deficient in fine ware. This is partly a chronological feature. The site clearly did not see much intense occupation in the later centuries when colour-coated fine-wares were relatively prolific. It is also, however, another dimension of the kitchen-oriented nature of the assemblage already noted. Despite the excavation of buildings reasonably designated as the residence of the commander and his family, the Loughor ceramics show little sign of high social status. Among the pottery other than the samian, at least, the picture is one of life dominated by the needs of the kitchen.

TABLE 16: SITE 55: ANALYSIS OF COARSE POTTERY BY FABRIC SOURCE

PERIOD	I		II		III	IV	VI	VII	VIII	IX	Misc.	TOTAL	%age	
PHASE	1	2	3	4	5	6	7	8	9	10	11			
Fabric <i>a</i>	-	3	2	4	10	3	21	4	17	13	26	5	108	27
Fabric <i>b</i>	-	-	-	4	5	1	7	5	1	8	13	10	54	13
Fabric <i>c</i>	-	-	-	-	-	-	7	14	14	13	66	1	115	28
Other Oxidised	-	2	-	1	-	-	1	2	2	4	5	1	18	4
Other Reduced	-	2	1	3	2	-	6	6	2	7	4	2	35	9
BBI	-	-	2	-	1	-	1	4	6	7	23	2	46	11
'Malvern'	-	-	-	-	-	-	-	-	-	-	1	1	2	-
Caerleon	-	-	-	-	-	-	-	1	-	-	-	2	3	1
'Terra Nigra'	-	-	1	-	-	-	-	-	-	-	-	1	2	-
Lyon cc	-	-	-	-	-	-	-	1	-	-	-	1	2	-
Early CG	-	-	-	-	-	-	-	1	-	-	-	-	1	-
Argonne cc	-	-	-	-	-	2	1	2	1	1	-	-	7	2
Köln/Nene Valley cc	-	-	-	-	1	-	3	-	3	-	-	2	9	2
Late CG cc	-	-	-	-	-	-	1	-	-	-	-	-	1	-
Mosel cc	-	-	-	-	-	-	-	-	-	1	-	-	1	-
Oxford cc	-	-	-	-	-	-	-	-	1	3	-	-	4	1
TOTAL	-	7	6	12	18	5	45	41	45	57	143	28	407	98
%age	-	2	1	3	4	1	11	10	11	14	35	7	99	

TABLE 17: SITE 55: ANALYSIS OF COARSE POTTERY BY FORM AND FUNCTION

PERIOD	I		II		III	IV	VI	VII	VIII	IX	Misc.	TOTAL	%age	
PHASE	1	2	3	4	5	6	7	8	9	10	11			
KITCHEN WARE														
Jar	-	4	4	8	11	3	27	22	25	31	99	15	249	61
Bowl	-	2	1	1	7	-	7	4	5	12	29	2	70	17
Dish	-	-	-	-	-	-	1	3	2	-	4	2	12	3
Lid	-	-	-	-	-	-	2	4	6	4	-	1	17	4
Cheese-press	-	-	-	-	-	-	-	-	-	-	1	-	1	-
TABLE WARE														
Flagon/jug	-	1	-	2	-	1	3	2	2	4	1	2	18	4
Beaker	-	-	-	-	-	1	3	6	2	4	3	4	23	6
Bowl	-	-	1	1	-	-	1	-	3	2	6	2	16	4
OTHER														
Tazza	-	-	-	-	-	-	1	-	-	-	-	-	1	-
TOTAL	-	7	6	12	18	5	45	41	45	57	143	28	407	99
%age	-	2	1	3	4	1	11	10	11	14	35	7	99	

Catalogue

Site 55

A complete list of the pottery from this site is contained in the archive. Here it seems appropriate only to summarise the material phase by phase and to publish a few pieces of intrinsic interest.

Summary by phase

Phase 2

Only seven vessels are represented. Of these three are in Fabric *a*. One is a flagon of probable first-century date. All the remainder would be typical of the Flavian or Trajanic period, but there is little truly diagnostic.

Phase 3

It is notable that, of the six vessels represented, two are in Black-burnished ware (BB1). If we may omit the chance of intrusion, then this demonstrates the presence of the ware from early in the occupation of Loughor. Other items include 'terra nigra' and would not be out-of-place in an early context.

Phase 4

This is another small collection with little to differentiate it from Phases 2–3. The phase does, however, see the first appearance of Fabric *b* on this site.

Phase 5

The eighteen vessels are predominantly of Fabrics *a* and *b*.

Phase 6

The only item of note in a small collection is a small fragment of a Köln roughcast beaker, an early appearance of such a fabric on a Welsh site.

Phase 7

The collection is predominantly Flavian-Trajanic. There is a single flanged bowl in BB1 of second-century type. Although such vessels usually occur in Hadrianic and Antonine contexts, the collection as a whole cannot be as late as this and a Trajanic date for the phase is to be preferred. Fabric *c* first appears in this phase.

Phase 8

The material from this phase is again predominantly Flavian to Trajanic. Of forty one vessels represented, only four are BB1, and of these at least one seems likely to be a first-century piece. Two of the remainder are Gillam (1976) Type 2, normally ascribed to the second century. However, an Antonine date seems improbable in view of the small amount of BB1 present, and the collection as a whole would better suit a Trajanic/Hadrianic or, at latest, an early- to mid-Hadrianic date. Two undoubtedly residual fragments may be noted, from a Lyon beaker and a Central Gaulish beaker (Greene 1979, fig. 18, no. 1).

Phase 9

The collection presents some problems. The majority is still Flavian to Trajanic. If we assume, however, that this is residual, then the dating must be carried by the few later pieces. These include jars in Black-burnished ware of mid- to late second-century and wall fragments from two jars with lattice which is probably later second century or later. Some short-lived second-century activity might suit the evidence.

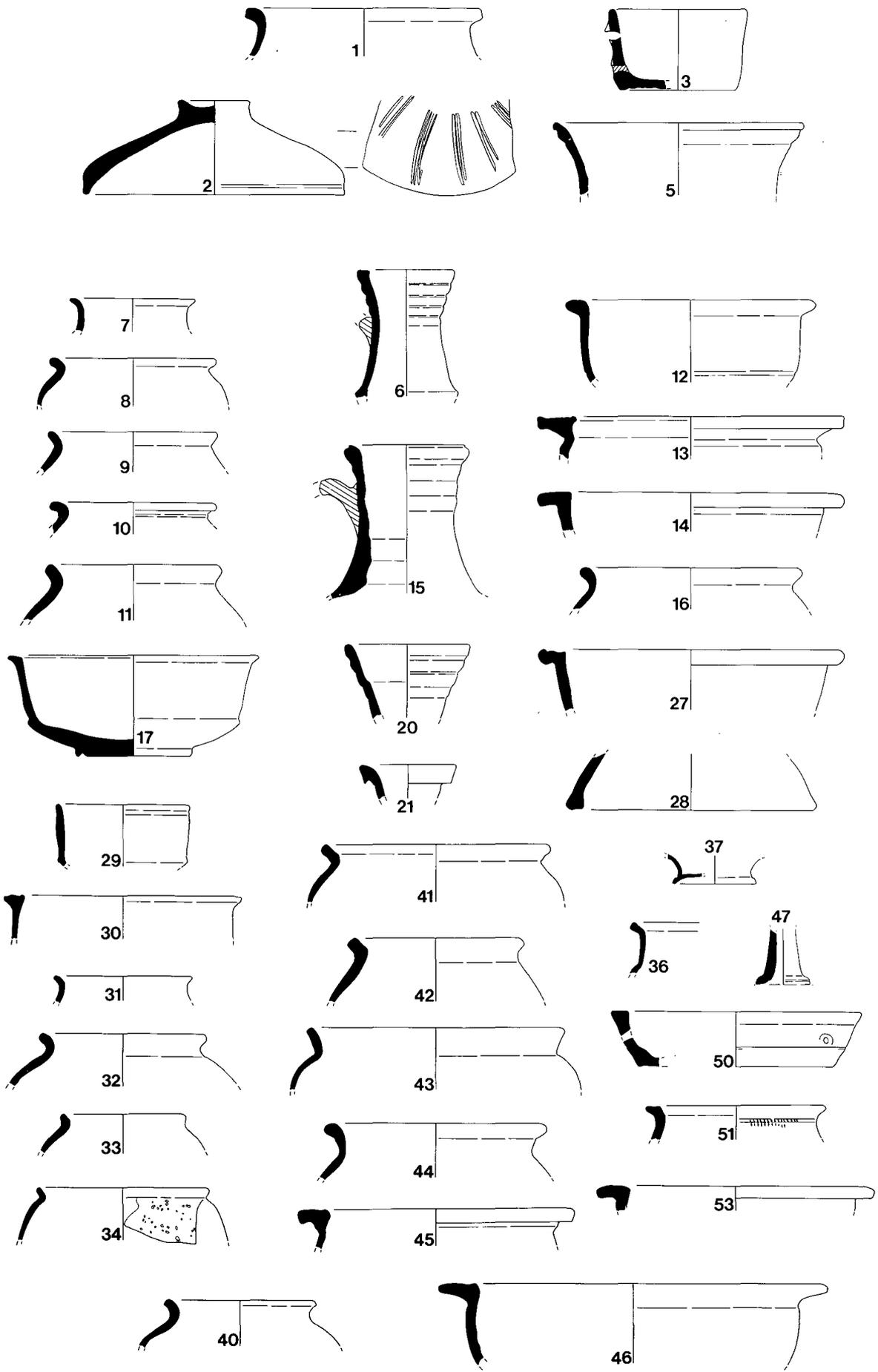


FIG. 123. Coarse pottery. Nos 1-3, 5, 6-17, 20, 21, 28-34, 36, 37, 41-47, 50, 51, 53 (1:4).

Phase 10

There is again a fair amount of early material, but, in this case, it is clearly residual. Vessels in Oxfordshire colour-coated ware and later Black-burnished ware types give the flavour of the collection. Gillam (1976) Types 8 (mid-third century), and 10 (late third century) are represented by single examples. Taken with a bowl which appears to be imitating late third- to early fourth-century BB1 types, these suggest late third-century occupation. However, the small amount of late material could suggest that such late occupation was short-lived.

Phase 11

Material from post-fort contexts and other contexts not ascribed a phase in no way deviate from the pattern of Phases 2–10.

Vessels of intrinsic interest

Phase 7

1. 180. Vessel in light grey Fabric *a* with darker surface. Possibly a dish, but fluted rims such as this are more common on tazzas and a pedestal base is possible.

Phase 8

2. 148. Lid or dish in a dark grey granular fabric which is clearly related to BB1. The form seems intermediate between the standard BB1 lid form (cf. Wallace & Webster 1989) and early Roman versions of the so called 'war cemetery bowl' (as Bidwell 1979 fig. 64 nos 118–20, also 125). A first-century date seems probable. Further fragment in Phase 8 Context 106. Small fragment from this vessel from 134.
3. 149. Small vessel in a light pink Fabric *b* with a grey core. Two holes have been pierced in the wall, apparently to facilitate the addition of a handle by means of mortice-and-tenon type joints. The result would have been a small tankard with one or more handles. The underside at the base is corrugated, possibly in imitation of the wooden vessels from which many Roman tankards are derived (cf. Webster 1975). The size of this vessel is so small that it seems more likely to have functioned as a measure than as a drinking vessel.

Phase 9

4. 093. Roughcast beaker in off-white fabric with a grey/brown colour-coat. Probably a Köln product (cf. Anderson 1981, fig. 19.1, no. 5). Our vessel is more rounded than that illustrated by Anderson, and has the groove and profile of her No. 1. In view of the likely derivation of this type from pre-Flavian Lyon ware forms (cf. Greene 1979, 25), a Flavian date seems probable. (Not illustrated)

Phase 10

5. 066. Bowl in light grey Fabric *a*. The form may be derived from Samian Form 29, and is most likely to be first-century in date. It occurs more frequently in mid-Wales and the Marches with examples from Caersws (Webster in Britnell 1989, 90, forms, section 3) and Wroxeter (Bushe-Fox 1913, fig. 17, nos 6–7).

Site 69

As with all other sites, a complete list of pottery, arranged by phase, is retained in the archive. The more significant pieces are illustrated below, with comments preceding each phase. Source and function are summarised in the tables below.

TABLE 18: SITE 69: ANALYSIS OF COARSE POTTERY BY FABRIC SOURCE

PERIOD	I		III	IV	V	VI	VII		VIII		IX	Misc	TOTAL	%age	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12			
Fabric <i>a</i>	-	3	8	2	2	6	6	-	3	2	9	5	-	46	16
Fabric <i>b</i>	-	2	1	1	2	2	5	-	2	2	5	2	-	24	8
Fabric <i>c</i>	-	-	6	-	1	1	12	2	3	12	14	19	-	70	24
Other Oxidised	-	3	3	1	5	1	2	2	-	6	6	4	-	33	11
Other Reduced	-	3	2	2	4	5	7	1	7	8	14	7	1	61	21
BB1	-	-	-	-	-	-	1	1	1	2	9	19	-	33	11
'Malvern'	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-
Caerleon	-	-	-	-	-	-	-	-	-	-	-	2	-	2	1
Severn Valley	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-
Lyon cc	-	-	-	-	1	1	2	-	-	-	1	-	1	6	2
Early CG	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-
Köln/Nene Valley cc	-	1	-	1	-	-	2	-	-	-	4	1	-	9	3
Late CG cc	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-
Oxford cc	-	-	-	-	-	-	-	-	-	1	-	3	-	4	1
New Forest	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-
TOTAL	-	12	21	7	15	17	38	6	16	33	62	65	2	294	99
%age	-	4	7	2	5	6	13	2	5	11	21	22	1	99	

TABLE 19: SITE 69: ANALYSIS OF COARSE POTTERY BY FORM AND FUNCTION

PERIOD	I		III	IV	V	VI	VII		VIII		IX	Misc	TOTAL	%age	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12			
KITCHEN WARE															
Jar	-	6	13	3	9	9	12	3	8	18	34	35	1	151	51
Bowl	-	3	2	1	2	1	8	2	7	9	12	11	-	58	20
Dish	-	-	1	-	-	-	1	-	-	-	3	3	-	8	3
Lid	-	-	1	1	-	2	7	-	-	4	3	4	-	22	7
Cheese-press	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
TABLE WARE															
Flagon/jug	-	2	3	1	1	2	1	-	1	1	1	2	-	15	5
Beaker	-	1	-	1	2	1	5	1	-	-	6	6	1	24	8
Tankard/mug	-	-	1	-	-	-	-	-	-	-	1	-	-	2	1
Jar	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-
Bowl	-	-	-	-	-	1	3	-	-	1	2	4	-	11	4
Dish	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-
TOTAL	-	12	21	7	15	17	38	6	16	33	62	65	2	294	99
%age	-	4	7	2	5	6	13	2	5	11	21	22	1	99	

Phase 2

Only twelve vessels were represented, but these do include two with parallels among the Usk assemblage (the flagons from Contexts 150 and 309). A Flavian date would certainly be suitable. It is noticeable that both Fabrics *a* and *b* are present. Context 150 also produced a sherd of Köln roughcast beaker, confirming the early appearance of this ware at Loughor.

6. 150. Flagon in light orange Fabric *b* with traces of a white slip; the even rings suggest a first-century date (cf. Usk Fortress series, Type 4 (Manning 1981) and Gillam 1970 no. 2).
7. 150. Jar in light orange Fabric *b*.
8. 150. Jar in light grey fabric with dark grey surface.
9. 150. Jar in light grey Fabric *a*.
10. 150. Jar in light grey Fabric *a*.
11. 150. Jar in light orange fabric with a grey core.
12. 150. Flanged bowl in light grey Fabric *a* with a darker surface.
13. 150. Flanged bowl in light grey fabric with a darker surface.
14. 150. Flanged bowl in light grey Fabric *a* with a darker surface. Also in this context, a Köln roughcast beaker.
15. 309. Large ring-necked flagon in light orange fabric with a grey core. Even rings such as

this are thought to be a first-century feature. Other pieces of the same vessel came from 329 (Phase 6) and 339 (Phase 5).

16. 327. Jar in orange fabric with grey core.

Phase 3

The collection is broadly similar to Phase 2. The first appearance of Fabric *c* may, however, be noted.

17. 140. Flanged and carinated bowl in Fabric *c*. One of the late first-century to early second-century series. Context also includes a grey jar in Fabric *c*.
18. 151. Grey jar in Fabric *a*. (Same as 290.)
The context also contained a jar in Fabric *a* with pronounced rusticated decoration and one in Fabric *c* with combed wavy-line decoration.
19. 155. Jar in light grey Fabric *a*.
20. 155. Flagon in orange granular fabric. The even rings suggest a first-century date.
21. 163. Flagon in orange fabric burnt light grey, and with faint traces of white slip. The form is of the so called Hofheim type (cf. Usk fortress series no. 1, Manning 1981). The form survived in use into the Flavian period as they are current in the Caerleon amphitheatre series (Wheeler & Wheeler 1928, nos 48–50).
22. 258. Jar in orange fabric with a grey core, and sooted grey/brown exterior. (Similar to No. 82.)
23. 258. Jar in light grey Fabric *a*. (Similar to No. 567.)
24. 258. Jar in light grey Fabric *c*. (Probably similar to No. 82.)
25. 258. Jar in light grey fabric, probably *c*. (Possibly similar to No. 386.) (Not illustrated)
26. 258. Rim, probably of a large jar, in light grey Fabric *c*.
27. 258. Flanged bowl in light grey Fabric *a*. One of the Flavian-Trajanic series.
28. 258. Lid, or possibly bowl, in light grey Fabric *a*.
29. 364. Tankard in orange fabric, probably Severn Valley ware (cf. Webster 1976, nos 38–9).
A date in the first or early second century is probable.

Phase 4

The phase again contains a fragment of a possible Köln beaker, but is otherwise notable only for the small size of the collection.

30. 138. Flanged bowl in Fabric *a*.
31. 154. Jar in light orange Fabric *b*.
32. 154. Jar in light grey Fabric *a*.
33. 154. Jar in light grey fabric with dark grey surface. (Same as No. 333.)

Phase 5

In this small collection, only the Lyon beaker from Context 147 stands out as in any way unusual.

34. 147. Roughcast beaker in Lyon ware (cf. Greene 1979, fig. 132 no. 2). Lyon ware is predominantly pre-Flavian, but since Greene studied its distribution (1979, 15, fig. 3) isolated examples of the beakers have come from a number of Welsh sites which are normally considered to be Flavian in foundation (in addition to Loughor, beaker fragments are known from Carmarthen, Segontium, and Cowbridge). Use of at least some of these vessels into the mid-70s is therefore highly likely. (A fragment of this vessel was also found in 128.)
35. 274. Jar in light grey Fabric *a*. (Possibly same as No. 301.) (Not illustrated)
36. 278. Beaker in light red fabric with a buff surface, possibly derived from late Iron Age butt beakers.
37. 278. Base in thin orange/buff fabric with faint traces of mica-dusting.

38. 278. Jar in pink/grey fabric with a grey surface. (Similar to No. 59.)
39. 278. Small everted-rimmed jar in light grey fabric.
40. 278. Jar in light grey fabric with darker surface.
41. 278. Everted-rimmed jar in pink fabric with a grey surface.
42. 278. Jar in light orange Fabric *b*.
43. 278. Jar in light orange fabric with sandy inclusions and a grey surface.
44. 278. Jar in light grey Fabric *c*.
45. 278. Flanged bowl in light grey Fabric *a*. One of the Flavian to Trajanic series.
46. 278. Flanged bowl in orange Fabric *b*.

The context also includes sherds of grey jars with rustication, and combed wavy-line decoration.

Phase 6

There seems little to distinguish this collection from that in Phases 3–5.

47. 116 (110). Neck, probably of a flagon, in smooth white fabric. But for the total absence of glaze a flagon from Central Gaul such as Greene (1979), fig. 40 no. 2 would seem probable. Perhaps an imitation.
48. 116. Jar in light grey Fabric *a*. (Similar to No. 465.)
This context also produced a grey jar in Fabric *c*, another grey jar, a possible lid in Fabric *b*, and a possible lid in a light grey fabric.
49. 117. Jar in light grey fabric. (Similar to No. 466.)
50. 117. Dish in light grey Fabric *a* with grey surface. The hole pierced through the wall appears to have been made before firing, and, although rather small, is likely to indicate that the complete vessel functioned as a cheese-press.
51. 149. Jar in light grey fabric with faint traces of rouletting around the neck externally.
52. 149. Everted-rimmed jar in light orange Fabric *b*. (Not illustrated)
53. 149. Flanged bowl in light grey Fabric *a*.
54. 149. Flange of a mortar-like bowl in light grey Fabric *a*. A late first-century to early second-century date is probable. (Not illustrated)

Part of a Lyon ware beaker (cf. No. 34) came from this context.

Phase 7

Phase 7 is mainly notable for what is *not* there. In particular, there is an almost total absence of Black-burnished ware (one vessel in BB1 out of 38 vessels present) making a date later than the Trajanic period very unlikely.

55. 056. Flagon in light grey fabric.
56. 056. Everted-rimmed jar in light grey fabric (cf. Gillam 1970, no. 101 for the general type). Late first century to early second century.
57. 056. Small beaker in light orange fabric.
58. 056. Everted-rimmed jar in light grey Fabric *c*. (Not illustrated)
59. 056. Everted-rimmed jar in light grey fabric. Late first century to early second century.
60. 056. Jar in light grey Fabric *c*. (Similar to No. 302.)
61. 056. Jar in light grey Fabric *a*.
62. 056. Jar in light grey Fabric *c*. There is a slight lid seating.
63. 056. Jar in light grey Fabric *c*. (Similar to No. 468.)
64. 056. Bowl in light grey Fabric *c* derived from Gallo-Belgic bowls (such as Greene 1979, 113, no. 34). Probably first century.
65. 056. Bowl in grey Fabric *c*. Probably rouletted and intended to be reminiscent of Samian Form 37. (cf. No. 260.)
66. 056. Flanged bowl in orange fabric. A granular version of Fabric *b*.
67. 056. Flanged bowl in orange Fabric *b*. (cf. No. 303.)

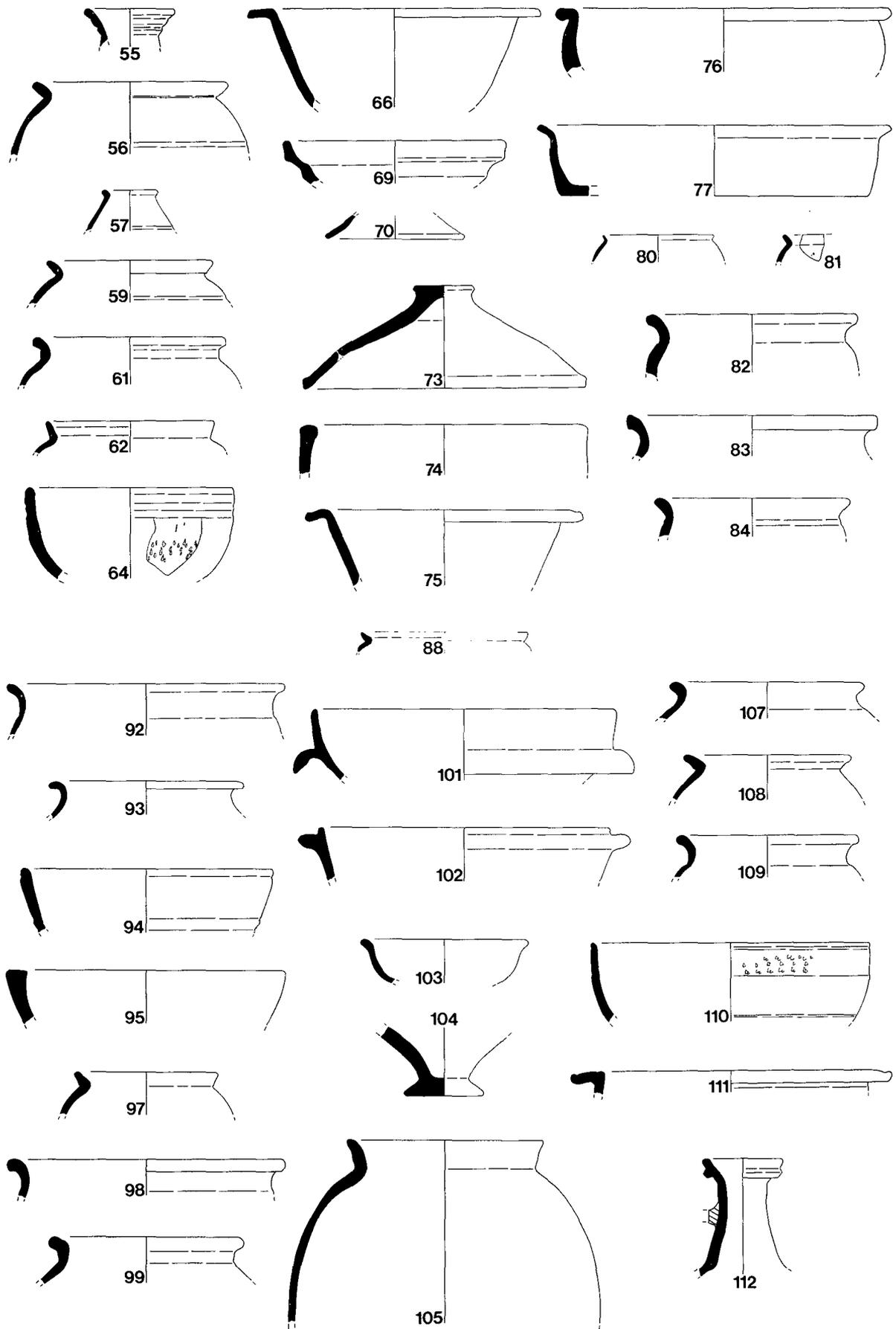


FIG. 124. Coarse pottery. Nos 55-57, 59, 60, 61, 62, 64, 66, 69, 70, 73-77, 80-84, 88, 92-99, 101-105, 107-112 (1:4).

68. 056. Flanged bowl in light grey Fabric *c*. One of three flanged bowls. (Not illustrated).
69. 056. Dish in grey Fabric *c* derived from the Gallo-Belgic form, Camulodunum (Hawkes & Hull 1947) Type 24.
70. 056. Lid in light grey fabric.
71. 056. Lid in light grey Fabric *a*. (cf. No. 197.)
72. 056. Lid in orange fabric. (cf. No. 197.)
73. 056. Lid in light grey Fabric *a*.
74. 056. Malvern-type jar in brown coarse fabric (cf. Peacock 1967).
75. 056. Flanged bowl in light pink/buff fabric, sooted on the flange. The fabric is similar to Fabric *b* but of unusual colour.
76. 056. Flanged bowl in very light pink/buff fabric as No. 75. Burnt grey externally.
77. 056. Flanged dish in light pink/buff fabric as No. 75.
78. 056. Lid in dark grey Fabric *c*. One of probably two similar vessels (cf. No. 330).
79. 056. Wall sherds of a jar in BB1 with acute-angled lattice burnt grey/buff on the surface. (Not illustrated)
80. 056. Small beaker in Lyon ware. Originally colour-coated and probably with roughcast decoration (cf. Greene 1979, fig. 12 no. 7 and No. 34 above for a comment on dating). A further fragment of the same vessel came from 116.

This context also produced a small fragment in white ware with applied dots possibly from a beaker of Köln origin (cf. Anderson 1981, fig. 19.1 no. 3).

81. 257. Beaker in Lyon ware (cf. Greene 1979, fig. 12, no. 11).
82. 257. Jar in light grey Fabric *a* with a darker surface.
83. 257. Jar in light grey fabric. The form derives from mid-first-century shapes such as the Usk fortress series Type 11 (Manning 1981 & 1993), but derivative forms such as this may survive into the early second century (cf. Gillam 1970, nos 108–9).
84. 257. Jar in light grey Fabric *a*.
85. 257. Flanged bowl in light grey fabric with darker grey surface. One of the Flavian to Trajanic series. (Not illustrated)
86. 257. Vessel, perhaps a shallow bowl, in granular grey fabric with a smooth surface. There are signs of sooting externally. (Not illustrated)
87. 257. Lid in light grey Fabric *a*. (Same as No. 478.)

This context also includes a small fragment of a roughcast beaker in cream fabric with a brown colour-coat perhaps from a Köln vessel.

Phase 8

Only six vessels are represented. The Black-burnished vessel from Context 044 should, however, push activity into the third century.

88. 042. Beaker in light pink fabric with a grey core.
89. 042. Jar in pink fabric with grey surface. (Not illustrated)
90. 042. Jar in grey Fabric *c*. (Not illustrated)

The context also includes a flanged bowl in Fabric *c* and a bowl base in a coarse dark grey fabric, probably not BB1 but not wheel-thrown.

91. 044. Jar in BB1 burnt grey to orange (cf. Gillam 1976, nos 6–7). Early to mid-third century. (Not illustrated)

Phase 9

Pottery from this phase does little more than illustrate the residual nature of the material.

92. 008. Jar in light grey Fabric *c*. The piece includes a fragment of rock *c*. 7 mm across and penetrating both sides of the neck.
93. 008. Jar in light grey fabric with darker surface.

94. 250. Bowl in light grey Fabric *c* with faint traces of rouletted decoration. A bowl reminiscent of the Samian Form 37 was intended.
95. 250. Bowl in light grey fabric.
Context includes a flanged bowl, and a fragment of vessel No. 83.
96. 256. Rim of jar in light grey Fabric *a* with darker surface, and fragments of deep random rustication as in 253, could be from the same vessel. (Not illustrated)
97. 264. Everted-rimmed jar in light grey fabric with lid seating.
98. 264. Jar in light grey fabric.
99. 264. Jar in light grey Fabric *a*.
100. 264. Flanged bowl or dish in grey/brown fabric with a darker surface. (Not illustrated)
Other fragments include a flagon base in Fabric *b* with a white slip from 101, and a fragment of a BB1 bowl apparently chamfered, and therefore second-century.

Phase 10

Residual material again predominates. Here we have illustrated only a range of later pieces, along with a few pieces of intrinsic interest. There is sufficient to make a date in the mid-third century, or later, a probability, but little closely datable.

100. 009. Bowl in orange fabric with a grey core and red colour coat. An Oxfordshire product, Young C51.3 *c.*240–400+, subsequently burnt in 1983.
102. 059. Flanged and beaded bowl in dark grey fabric, closely similar to BB1 vessels such as Gillam (1976) no. 46 and probably of similar date. Late third to early fourth century.
103. 227. Bowl in light grey Fabric *a*, with a darker surface.
104. 227. Base of a jar in light orange fabric, apparently cut down to form a lid.
105. 255. Jar in light grey Fabric *c*. One sherd shows both an indentation and faint traces of a handle, suggesting a vessel broadly similar to Gillam (1970) no. 126. The BB1 vessel represented by Gillam 126 is Iron Age in derivation (cf. Brailsford 1957, fig. 1, no. 6a), and a date for our piece at any time during the first or second centuries seems possible.
106. 255. Lid in light grey fabric. (Not illustrated)
107. 320. Jar in light grey fabric with darker surface (cf. Usk Fortress series 11.1). Probably first century.
108. 330. Jar in light grey fabric.
109. 330. Jar in grey Fabric *c* with a darker surface (cf. The Hall, Caerleon, Murray-Threipland 1967, Period 1 no. 1). First century. One of two similar vessels.
110. 330. Bowl in orange fabric with cream slip overlain by dark red paint or slip, intended to be reminiscent of Samian Form 37.
111. 330. Flanged bowl in light grey Fabric *a*.
112. 332. Flagon in light orange-buff fabric (cf. Gillam 1970, no. 6). Second century.

Phases 11–12

Residual material is again much in evidence. Here, we have illustrated only later pieces and those of intrinsic interest. It is notable that there is a greater range of later pottery than hitherto seen and that this probably runs across both the later third century and into the mid- or later fourth century. However, all of the latest pieces come from post-Roman contexts. Examples of fabrics from the New Forest and the Caerleon Ware kilns, both rare fabrics at Loughor, may be noted.

113. 055. Jar in BB1 (cf. Gillam 1976, no. 11). Late third century to early fourth century.
114. 055. Flanged and beaded bowl in a grey granular fabric, burnt orange. A local imitation of the late third-century to fourth-century BB1 bowls is probable.
115. 066. Dish in BB1.

Residual vessels in this context include three jars in Fabric *c*, and a bowl in Fabric *a*.

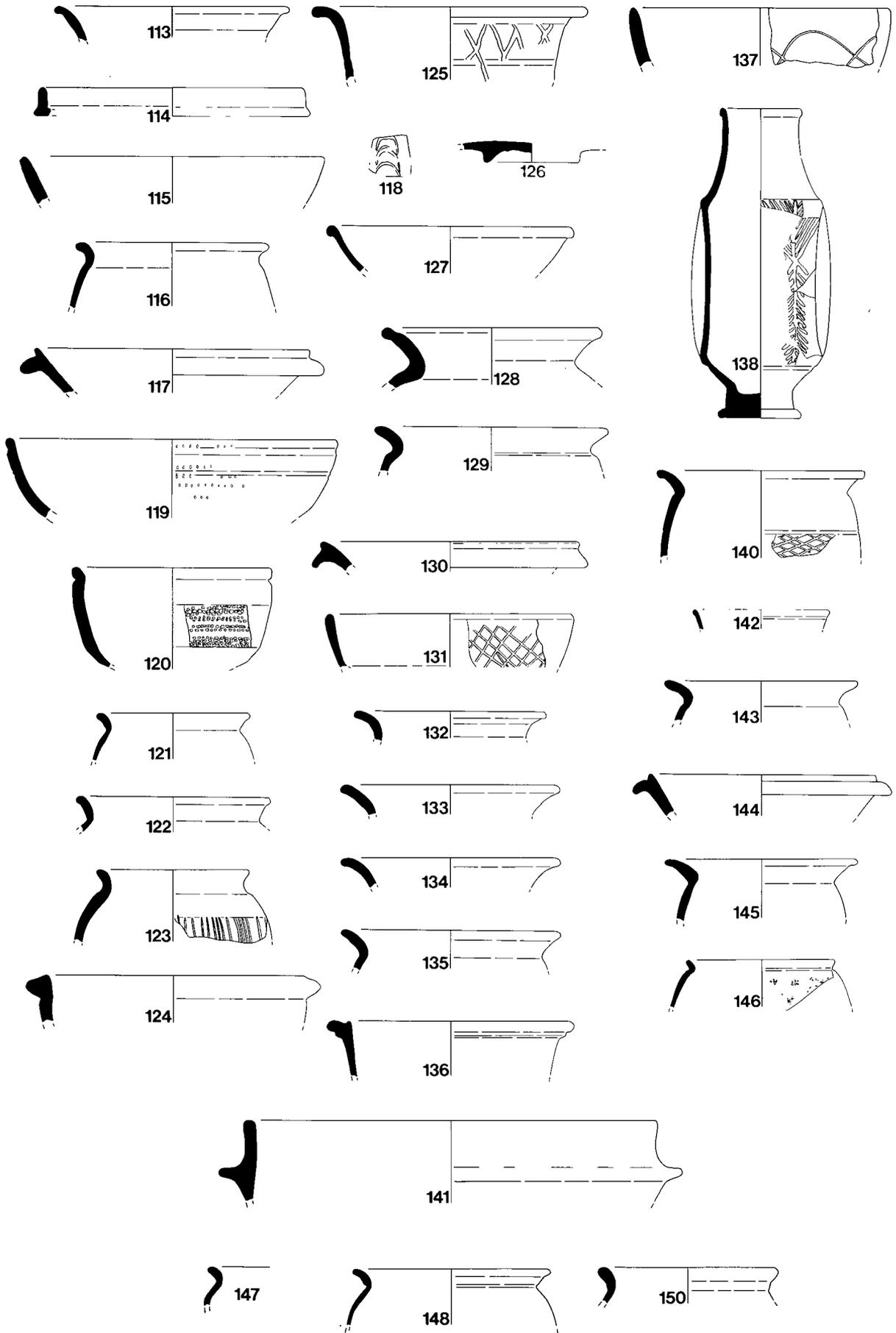


FIG. 125. Coarse pottery. Nos 113-138, 140-148, 150 (1:4).

116. 071. Jar in BB1.
117. 071. Flanged and beaded bowl in BB1 burnt buff in places (cf. Gillam 1976, no. 46). Late third century to early fourth century.
118. 186. 'Scale' beaker in white fabric with grey/brown colour-coat. A Nene Valley product (cf. Howe, Perrin & Mackreth 1980, nos 38–9). Mid- to late third century.
119. 189. Bowl in orange/buff fabric with a grey core rouletted externally. Reminiscent of Samian Form 37.
120. 226. Bowl in grey fabric decorated with an instrument with rectangular teeth, probably a roulette, but possibly a comb. A vessel reminiscent of second-century BB1 bowls such as Gillam (1976) no. 52 may have been intended.
121. 235. Jar in light grey fabric. There is some resemblance to second-century BB1 forms.
122. 235. As No. 121.
123. 235. Jar in BB1 (cf. Gillam 1970, no. 124). Early to mid-second century.
124. 235. Perhaps a large jar in grey/brown Fabric *c*.
125. 235. Flanged bowl in light grey fabric. The form is derived from the Flavian to Trajanic series, but the lattice decoration shows influence from BB1, and a Trajanic to Hadrianic date would seem most appropriate.
126. 235. Base, probably of a dish or bowl, in light orange fabric with a grey core and traces of mica-dusting.
127. 001. Bowl in light red fabric with a grey core, an Oxfordshire product and originally colour-coated (cf. Young 1977, C45). Mid-third to fourth century.
The context includes a flanged bowl in Fabric *a*.
128. 003. Jar in BB1, burnt light grey. The angle of the rim resembles Gillam (1976) nos 12–13, and a late date is assured, but the internal groove on the rim is most unusual and suggests a vessel designed to take a lid.
129. 003. Jar in light grey Fabric *c*. The rims of local grey jars tend to be more flared in the later period (cf. Whitton, Jarrett & Wrathmell 1981, no. 473, and Llanedeyrn, Vyner & Evans 1978, fig. 4). This could well be a later piece.
130. 003. Flanged and ridged bowl in BB1 (cf. Gillam 1976, no. 48). Early to mid-fourth century. One of four flanged and ridged bowls.
131. 003. Dish in BB1.
132–5 are all examples of jars in BB1 with flaring rims. The range is illustrated by Gillam (1976, nos 12–14). Gillam dates these jars between the early and mid-third century, but similar jars appear at Lydney (Wheeler & Wheeler 1932), and survival later in South Wales is possible.
132. 005. Jar in BB1.
133. 005. Jar in BB1.
134. 005. Jar in BB1.
135. 005. Jar in BB1.
136. 005. Flanged and ridged bowl. Probably BB1.
137. 005. Dish in BB1 (Gillam 1976, no. 77). Late second century to early third century.
138. 007. Beaker in grey to buff fabric with a dark grey-brown colour-coat and white painted decoration. A New Forest product (Fulford 1975, type 42). First half of fourth century. Other fragments, which might be part of the same vessel, although few pieces join, are present in Contexts 005 (6 fragments) and 003 (7 fragments).
139. 017. Jar in BB1 (cf. Lydney, Wheeler & Wheeler 1932, nos 55–6). Typologically, these are among the latest BB1 jars produced, and a mid-to late fourth-century date seems probable. (Not illustrated)
The context also includes a BB1 dish.
140. 020. Jar in BB1 (cf. Gillam 1976, no. 14, dated by Gillam to the mid-fourth century).
141. 020. Flanged bowl in light grey Fabric *c*.
142. 222. Cup in a fabric which has burnt light grey and which now has a black-slipped surface – a colour-coated vessel from Central Gaul (as Greene 1978, fig. 2.3 no. 8). Probably early to mid-third century.

143. 303. Jar in light grey Fabric *c*, probably intended to be reminiscent of late BB1 jar forms such as Gillam 1976, no. 12.
144. 311. Flanged and ridged bowl in BB1 (cf. Gillam 1976, nos 45–6). Late third to early fourth century.
145. 317. Jar in BB1 (cf. Gillam 1976, no. 11). Late third to early fourth century.
146. 124. Beaker in greenish-cream fabric with roughcast decoration and maroon/grey colour-coat. A Lyon product (cf. Greene 1979, fig. 12 no. 9).

Site 66

With only eleven vessels represented, there is little that can be said of this assemblage. All vessels present could be from the first fort (i.e. Periods I–VI). The material is summarised in standard form.

TABLE 20: SITE 66: ANALYSIS OF COARSE POTTERY BY FABRIC SOURCE

PERIOD	I	VI	VII	IX		
PHASE	1	2	3	4	TOTAL	%age
Fabric <i>a</i>	-	-	-	-	-	-
Fabric <i>b</i>	-	-	-	-	-	-
Fabric <i>c</i>	-	3	1	-	4	37
Other Oxidised	1	1	-	-	2	18
Other Reduced	-	-	2	1	3	27
BB1	-	-	1	1	2	18
TOTAL	1	4	4	2	11	100
%age	9	37	37	18	101	

TABLE 21: SITE 66: ANALYSIS OF COARSE POTTERY BY FORM AND FUNCTION

PERIOD	I	VI	VII	IX		
PHASE	1	2	3	4	TOTAL	%age
KITCHEN WARE						
Jar	1	3	4	2	10	91
TABLE WARE						
Flagon/jug	-	1	-	-	1	9
TOTAL	1	4	4	2	11	100
%age	9	37	37	18	101	

Phase 1

147. 018. Jar in light red/brown fabric with mid-grey surface.

Phase 2

148. 012. Jar in light grey Fabric *c*.
149. 013. Everted rimmed jar in light grey Fabric *c*. (Similar to No. 147.)
The context includes an orange flagon, probably ring-necked.
A grey jar similar to No. 148 came from 017.

Phase 3

150. 014. Jar in light grey Fabric *c*.

Also present was a light grey jar from 010 and a BB1 jar rim, probably part of No. 151, and a dark grey jar from 011.

Phase 4

151. 001. Jar in BB1. The form could be second-century, but the general type appears at Exeter (Bidwell 1977, no. 8) and a pre-Hadrianic date cannot be ruled out. (Not illustrated)

Site 54

Only 22 vessels are represented; these are summarised in TABLES 22 and 23 below.

TABLE 22: SITE 54: ANALYSIS OF COARSE POTTERY BY FABRIC SOURCE

PERIOD	IV	VI	VII	IX	TOTAL	%age
PHASE	1	2	3	4/5		
Fabric <i>a</i>	4	-	-	1	5	23
Fabric <i>b</i>	1	3	-	-	4	18
Fabric <i>c</i>	1	-	-	1	2	9
Other Oxidised	4	1	-	-	5	23
Other Reduced	2	1	-	1	4	18
BB1	-	1	1	-	2	9
TOTAL	12	6	1	3	22	100
%age	55	27	5	14	101	

TABLE 23: SITE 54: ANALYSIS OF COARSE POTTERY BY FORM AND FUNCTION

PERIOD	IV	VI	VII	IX	TOTAL	%age
PHASE	1	2	3	4/5		
KITCHEN WARE						
Jar	5	3	1	1	10	45
Bowl	4	1	-	-	5	23
Dish	-	-	-	1	1	5
Lid	-	1	-	-	1	5
TABLE WARE						
Flagon/jug	-	-	-	1	1	5
Beaker	1	-	-	-	1	5
Tankard/mug	-	-	-	-	-	-
Jar	1	-	-	-	1	5
Bowl	1	-	-	-	1	5
OTHER						
Tazza	-	1	-	-	1	5
TOTAL	12	6	1	3	22	103
%age	55	27	5	14	101	

Of the 22 vessels, only those from Phases 1 and 2 are published here. Phase 3 is represented only by two chips of BB1 and Phase 5 by residual vessels. Phases 1 and 2, however, have some interest. Even given the small number of vessels represented, the range of forms seems unusually restricted. In these phases there seems to be a dearth of everted-rimmed jars or angular carinated bowls and jars with curved rims seem to predominate. Elsewhere, these seem to be characteristic of the later main fort phases (i.e. of Periods III–V). The meagre evidence would support a Period IV date for Phase 1. There is little to show that Phase 2 need be much later.

Phase 1

152. 047. Jar in light grey fabric.

The context includes a flanged bowl in a light grey fabric.

153. 074. Flanged bowl in light grey Fabric *a* with dark inclusions.

154. 147. Jar in granular brown fabric with dark grey surface and over the rim; sherds show a cordon on the neck and a burnished body. (Not illustrated)

155. 147. Jar in light grey Fabric *a* with dark grey surface and rusticated decoration. Late first early second century.

156. 147. Jar in light grey Fabric *a*.

157. 157. Jar in light grey Fabric *c* with wavy-line decoration.

A flanged bowl in buff fabric with dark inclusions is also present.

Phase 2

158. 018. Jar in light grey fabric. (Not illustrated)

159. 018. Tazza in pink Fabric *b*.

160. 019. Lid in BB1 (cf. Wallace and Webster 1989).

161. 025. Jar in light orange Fabric *b*.

162. 078. Flanged bowl in orange-buff Fabric *b* with dark inclusions.

163. 078. Jar in Fabric *b*.

Site 57

The material from Sites 57 and 53 represents the largest and most significant collection from the interior of the forts. It is notable for the enormous preponderance of Flavian and Trajanic material and the relative sparsity of certainly later pieces. There can be little doubt, looking at this collection, that the site saw its major military activity in the pre-Hadrianic period. Material from Site 57 is summarised in the two tables below.

TABLE 24: SITE 57: ANALYSIS OF COARSE POTTERY BY FABRIC SOURCE

PERIOD	I		III		IV	V	VI		VII		VIII			IX		TOTAL	%age	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	U/S	TOTAL	%age
Fabric <i>a</i>	-	-	-	2	3	1	1	3	4	19	-	1	-	-	-	-	34	12
Fabric <i>b</i>	1	-	-	-	-	-	-	7	-	2	-	-	-	-	-	1	11	4
Fabric <i>c</i>	-	-	-	-	5	1	1	10	14	55	-	3	-	-	-	2	91	31
Other Oxidised	4	-	-	6	4	1	-	10	6	6	1	1	-	1	-	2	42	14
Other Reduced	-	-	-	8	4	1	6	10	13	11	8	5	1	3	2	11	83	28
BB1	-	-	-	-	1	-	-	2	2	9	4	2	-	3	3	1	27	9
'Malvern'	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-
Severn Valley	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-
'Terra Nigra'	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Lyon cc	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-
Argonne cc	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
Köln/Nene Valley cc	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	2	1
TOTAL	5	-	-	17	17	4	9	44	39	104	13	12	2	7	5	17	295	99
%age	2	-	-	6	6	1	3	15	13	35	4	4	1	2	2	6	100	

TABLE 25: SITE 57: ANALYSIS OF COARSE POTTERY BY FORM AND FUNCTION

PERIOD	I			III	IV	V	VI	VII	VIII			IX	TOTAL		%age			
PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	U/S	TOTAL	%age
KITCHEN WARE																		
Jar	4	-	-	6	8	2	5	24	23	74	7	7	2	5	2	11	180	61
Bowl	1	-	-	1	2	-	2	6	6	18	3	3	-	1	1	1	45	15
Dish	-	-	-	-	1	1	-	4	1	1	1	-	-	-	1	1	11	4
Lid	-	-	-	3	1	-	1	3	3	4	1	1	-	-	1	1	19	6
TABLE WARE																		
Flagon/jug	-	-	-	4	-	-	-	2	1	1	-	1	-	-	-	1	10	4
Beaker	-	-	-	-	-	-	1	1	-	2	-	-	-	-	-	1	5	2
Tankard/mug	-	-	-	-	1	-	-	1	-	-	-	-	-	1	-	1	4	1
Jar	-	-	-	2	1	-	-	1	1	-	-	-	-	-	-	-	5	2
Bowl	-	-	-	-	2	1	-	2	4	4	-	-	-	-	-	-	13	4
Dish	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
OTHER																		
Tazza	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-
Lamp	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-
TOTAL	5	-	-	17	17	4	9	44	39	104	13	12	2	7	5	17	295	99
%age	2	-	-	6	6	1	3	15	13	35	4	4	1	2	2	6	100	

Phase 1

Only five vessels are represented, all by wall sherds. Only one is in Fabric *b*. The remainder are in oxidised fabrics with a high mica content and perhaps originally mica-dusted. The collection seems anomalous, but this is perhaps to be expected from the very beginning of the site, before 'normal services' were established.

Phase 4

Further sherds in the highly micaceous fabric noted in Phase 1 were found in Context 445. Other contexts include a number of vessels which would suit an early to mid-Flavian date (cf. No. 164). Only the lattice-decorated vessel from Context 322 would seem out of place in a mid-Flavian context.

164. 308. Flagon in light grey Fabric *a* with traces of a darker surface. The neck and rim are unusual, but were probably intended to be reminiscent of a glazed Central Gaulish flagon (Greene, 1979, fig. 40, nos 2-3). The Central Gaulish vessel is predominantly pre-Flavian, so that the present vessel should not be much later than early Flavian in date.

165. 308. Lid in dark grey granular fabric (cf. Whitton, Jarrett & Wrathmell 1981, no. 453). (Same as No. 330.)

166. 311. Jar in light grey Fabric *a*. (Same as No. 333.)

167. 311. Bowl in granular fabric burnt dark grey but probably originally orange. A portion of the lower vessel suggests that it was carinated.

168. 330. Jar in light grey fabric with sandy filler.

169. 332. Flagon in light grey fabric.

170. 332. Jar in mid-grey fabric with burnished surface. The vessel resembles the so called 'egg shell' *terra nigra* (cf. Greene 1979, fig. 52, nos 1-3).

171. 332. Jar in orange fabric with a light grey core and dark grey surface. The lattice decoration suggests influence from second-century BB1 jars.

172. 377. Flagon in pink/buff fabric with traces of a white slip. The even rings suggest a first-century date.

173. 402. Flagon in light orange fabric.

174. 410. Jar in light grey fabric. (Same as No. 284.)

175. 410. Dish in grey fabric (possibly the result of burning). The external surface is smooth and may have been mica-dusted. A slightly inturned lip is characteristic of some first-century and second-century vessels from military sites (e.g. Holt, Grimes 1930, nos 131-6).

176. 445. Small jar in grey fabric with burnished external surface and applied dots. For the

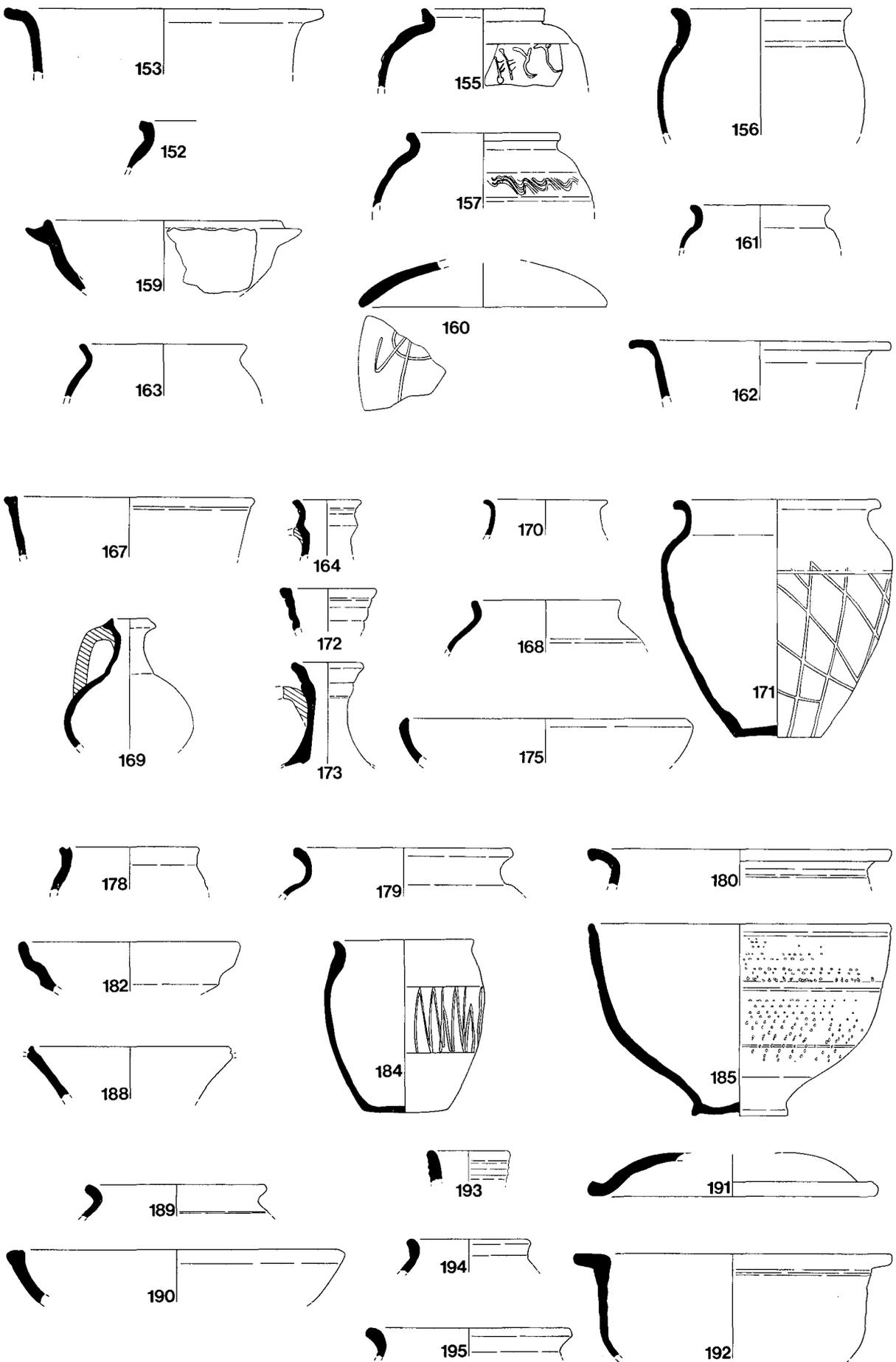


FIG. 126. Coarse pottery. Nos 152, 153, 155-157, 160-164, 167-173, 175, 178-180, 182, 184, 185, 188-195 (1:4).

general type see Caerleon fortress baths (Greep 1986) group 1, fig. 19, no. 14, and Gillam (1970) no. 68. Flavian to Trajanic. (Not illustrated)

The context includes a fragment of vessel No. 167, and many sherds in the micaceous fabric noted in Phase 1.

Phase 5

The material from this phase appears to be Flavian or Trajanic. There is little Black-burnished ware, and such as there is could be first-century in date. There is thus little to distinguish this collection from that of Phase 4.

177. 344. Lid in grey Fabric *c*. (Not illustrated)

178. 351. Jar in orange fabric with a grey core, probably oxidised Fabric *c*.

The context also contains a rusticated jar.

179. 365. Jar in light grey Fabric *c*.

180. 365. Bowl in brown Fabric *c* with grey surface.

181. 365. Rim, probably of a tankard in light grey Fabric *c*. (Not illustrated)

182. 365. Dish in light grey Fabric *c* with darker surface (cf. Whitton, Jarrett & Wrathmell 1981, no. 271).

183. 365. Vessel in light grey Fabric *a*; as it survives it could be a fragment of a very small pot, but it is more likely to be a fragment of the spout of an open lamp of the 'crusy type' (cf. Usk fortress series no. 27, Manning 1981 and 1993).

184. 365. Jar in BB1. The form is typologically early and could be first-century (cf. Bidwell 1979, fig. 60 no. 20), but a Hadrianic date is more probable (cf. Birdoswald, Birley & Richmond 1930, no. 35a).

185. 365. Bowl in light grey Fabric *a* with mid-grey surface. The exterior has been rouletted. A bowl reminiscent of Samian Form 37 was intended.

The context includes a small fragment of a BB1 bowl.

186. 371. Jar in light grey Fabric *a* with a darker surface. (Not illustrated)

187. 371. Jar in brown fabric with a grey core and grey surfaces, burnished in places externally.

188. 394. Fragment, probably of a bowl, in light orange fabric. The rim is broken, and may have been flanged.

Phases 6 and 7

There is little material from Phases 6 and 7 and nothing truly diagnostic. The best that can be said is that there is nothing that need not be Flavian or Trajanic.

Phase 6

189. 247. Jar in light orange fabric.

190. 299. Dish in light grey fabric, probably Fabric *a*.

Phase 7

191. 190. Lid in light grey fabric with grey in brown 'sandwich' core.

192. 193. Flanged bowl in light grey Fabric *a* with darker surfaces. One of the Flavian to Trajanic series.

193. 245. Jar in light grey fabric.

194. 245. Jar in light grey fabric.

The context includes a wide-mouthed jar in Fabric *c* and a fragment of Vessel No. 220.

195. 251. Jar in light grey fabric with orange core.

Phase 8

The material from Phase 8 is predominantly pre-Hadrianic. Only No. 214 appears to be later and this may be regarded as intrusive or perhaps, given the wide differences to be seen in

first-century BB1 jar rims, a piece which is precociously developed. The 'second', No. 203, may be noted.

196. 192. Jar in brown fabric with a dark grey surface.
197. 192. Jar in orange granular fabric with grey/brown surface. (Not illustrated)
198. 192. Jar in Fabric *c*, orange (fabric) with a grey surface and a grey core.
199. 192. Lid in oxidised Fabric *c*.
200. 192. Lid in orange fabric, probably Fabric *b*. (Not illustrated)
201. 196. Flagon in pink/buff (cf. Gillam 1970 no. 4). Late first-century to early/mid-second century.
202. 196. Jar in dark grey Fabric *c*. (Same as No. 241.)
203. 196. Jar in light grey fabric with few visible inclusions. The rim and shoulder are very distorted and, whether this is a second or waster, it is unlikely to have travelled far from its place of manufacture. (Not illustrated)
204. 196. Jar in light grey Fabric *a*.
205. 196. Jar in light grey Fabric *c*.
206. 196. Tankard in light orange/buff Severn Valley Ware with lattice decoration. The fabric has a grey core. Illustrated with fragments from Contexts 142, 183, 242, 243, and 400.
207. 196. ?Bowl in light orange Fabric *b*.
208. 196. ?Bowl in dark grey fabric.
209. 196. Flanged bowl in light grey Fabric *c*. (Same as No. 399.)
210. 196. Dish in light grey fabric. (Same as No. 416.)
211. 196. Dish in orange/buff Fabric *b*.
212. 196. Jar in thin pink fabric with faint traces of mica-dusting. A point has been impressed in the interior wall to produce very slight bosses on the exterior. (Not illustrated)
213. 197. Jar in BB1.
214. 197. Jar in grey fabric with orange and grey core.
215. 197. Jar in light grey Fabric *c*.
216. 197. Jar in BB1, possibly Gillam (1976) no. 3. Mid- to late second century. (Not illustrated)
217. 197. Dish in orange/buff fabric.
218. 286. Jar in orange/brown fabric with a grey surface.
219. 413. Dish in orange/buff fabric burnt grey in places.
220. 415. Jar in grey fabric with a burnished exterior surface. There was a further fragment in Context 245.
221. 415. Flanged bowl in granular grey fabric with dark grey surface and sooting.

Phase 9

In common with most material from Period VII, that from Phase 9 contains a mass of Flavian to Trajanic material. Diagnostic later pieces are few and far between, but, such as there are, would suggest late second- or early third-century activity.

222. 138. Everted-rimmed jar with rusticated decoration. Rustication was popular in the late first century and early second century (cf. Thompson 1968).
223. 138. Flanged bowl in light grey Fabric *c* burnished externally around a zone of wavy-line decoration, possibly achieved with a stiff brush.
224. 141. Bowl in mid-grey fabric with traces of rouletted decoration. A vessel reminiscent of Samian Form 37 was intended. (Similar to No. 260.)
225. 141. Lid in BB1 burnt light grey (cf. Wallace & Webster 1989).
226. 144. Everted-rimmed jar in grey/brown fabric with a dark grey burnished surface. A late first-century to early second-century style.
227. 144. Bowl in light orange fabric with a grey core, probably derived from Samian Form

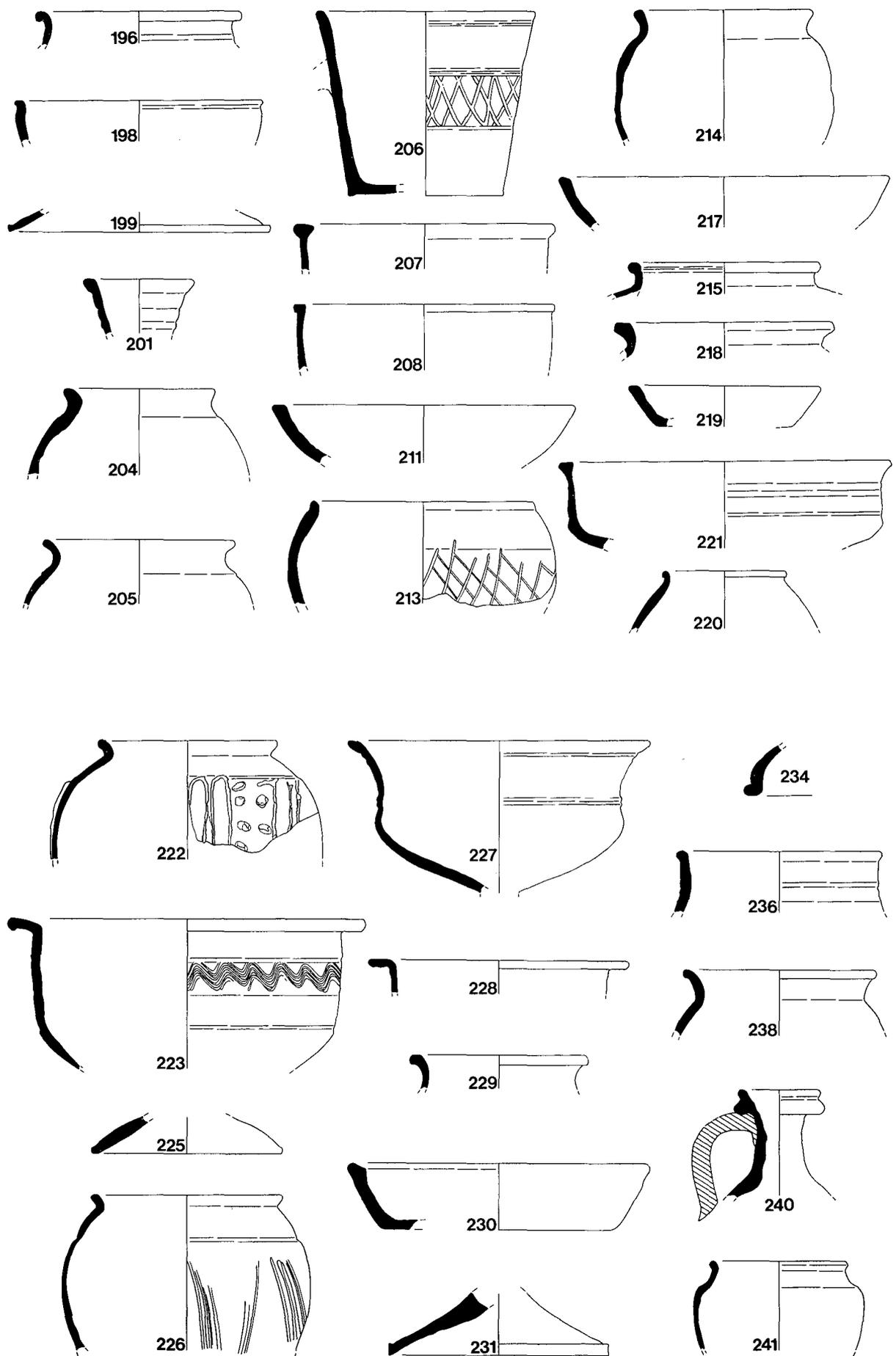


FIG. 127. Coarse pottery. Nos 196, 198, 199, 201, 204–208, 211, 213–215, 217–223, 225–231, 234, 236, 238, 240, 241 (1:4).

29. Vessels of this general type appear in Central Wales and the Marches in the later first century and early second century (cf. Wroxeter, Bushe-Fox 1913, fig. 17 nos 6–7).
228. 144. Flanged bowl in brown fabric.
229. 152. Jar in light grey Fabric *c*.
230. 152. Dish in light grey Fabric *a*.
231. 152. Lid in light grey Fabric *c*, originally smoothed or burnished.
The context includes a wall fragment from a burnished jar with a decoration which could have been similar to Gillam (1970) no. 144.
232. 163. ?Bowl in light grey fabric.
The context includes a jar in granular grey fabric with an orange core and a jar in orange fabric, possibly burnt Fabric *c*. (Not illustrated)
233. 189. Grey jar in Fabric *c*. (Same as No. 391.)
234. 189. Bowl or lid in dark grey slightly micaceous fabric.
235. 189. Jar in light grey Fabric *c*.
The context includes a fragment of the same jar (Gillam 1970, no. 144) as noted in 152 (No. 229 above). (Not illustrated)
236. 194. Bowl in orange fabric with a grey core.
237. 206. Lid in dark grey granular fabric. (Not illustrated)
238. 242. Jar in BB1 (cf. Gillam 1976, no. 4). Late second century.
The context includes a fragment of Vessel No. 206.
239. 244. Everted-rimmed jar in grey fabric. (Not illustrated)
240. 385. Flagon in light buff fabric (cf. Gillam 1970, no. 16), late second century to mid-third century for the general type.
241. 385. Jar in dark grey granular fabric.

Phase 10

As in most later phases, residual Flavian and Trajanic material proliferates. However, there are a number of pieces which must be late third or fourth century and it is presumably to this date that the phase belongs.

242. 047. Jar in BB1. The marked flare to the rim suggests that this is late third-century at the earliest and more probably fourth-century (cf. Gillam 1976, nos 12–14). (Not illustrated)
243. 047. Flanged bowl or dish in BB1. One of the second-century series.
244. 048. Bowl in light grey Fabric *c*.
245. 052. Jar in mid-grey fabric; the rim is distorted and this could be a waster.
246. 060. Flanged bowl in dark grey granular fabric with burnished surface. Despite the close resemblance to the common Flavian to Trajanic flanged bowl, this piece has all the appearance of being in BB1, and may be a rare example of a first-century BB1 flanged bowl. (Not illustrated)
247. 084. Wide-mouthed jar in light grey Fabric *c*. One of the comparatively few examples of this common South Wales form from Loughor.
248. 085. Jar in BB1 (cf. Gillam 1976, no. 12). Early fourth century.
249. 085. Bowl in hard off-white fabric.
250. 086. Flagon in Fabric *c*.
251. 086. Lid in light grey Fabric *a* (same as No. 419).
252. 086. Vessel in light grey fabric, possibly Fabric *a*. This could be a lid, but the internal angle of the rim appears to have been deliberately corrugated, making a shallow bowl more probable.
253. 121. Wide-mouthed jar in Fabric *c*.
The context includes a second-century Black-burnished ware flanged bowl, a second-century jar in BB1, and a roughcast beaker from the Argonne.
254. 142. Jar in light grey Fabric *c* (a larger version of No. 245).

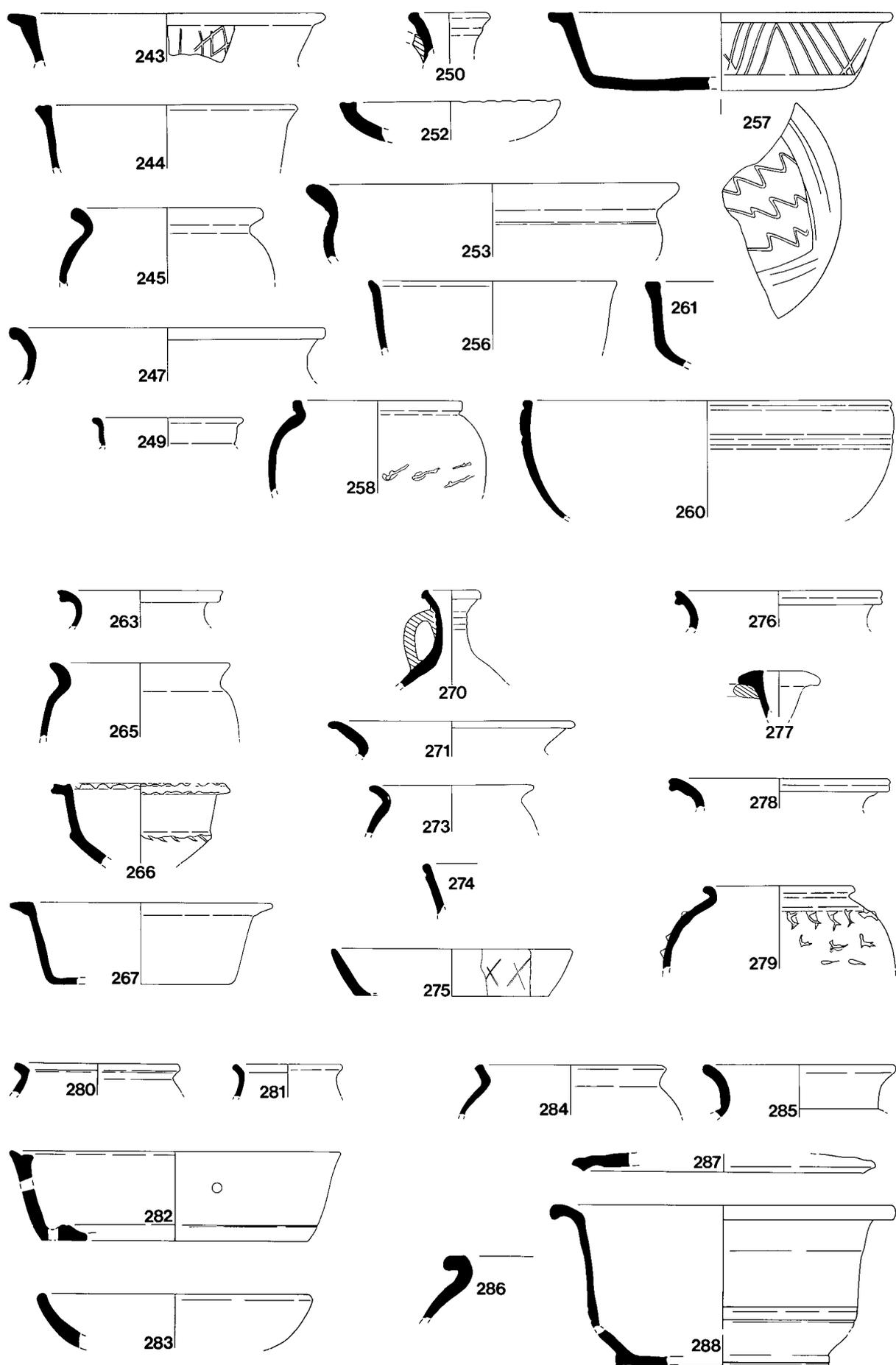


FIG. 128. Coarse pottery. Nos 243–245, 247, 249, 250, 252, 253, 256–258, 260, 261, 263, 265–267, 270, 271, 273–288 (1:4).

255. 142. Bowl in light orange fabric with a grey core; ultimately derived from Samian Form 29. (Not illustrated)
256. 142. Bowl or tankard in light orange/red fabric.
257. 142. Flanged dish in BB1. One of the second-century series. The style of decoration on the wall is unusual, as is the way that wavy-line decoration has been used in a block on the underside of the base.
258. 151. Rusticated jar in a grey fabric with orange and grey core.
259. 151. Everted-rimmed jar in light grey fabric. (Not illustrated)
260. 151. Bowl in light grey fabric with a shape resembling Samian Form 37.
261. 151. Bowl in grey fabric with a darker surface.
262. 185. Jar in light orange fabric. (Not illustrated)

Phase 11

Material from Phase 11 is sparse. Although there is, again, a preponderance of residual pieces, it is noticeable that these include more second-century pieces and fewer Flavian-Trajanic. In view of the material from Phase 10, deposition of that in Phase 11 cannot be earlier than the later third century, but need not be significantly later.

263. 051. Jar in light grey fabric (cf. Llanederyn, Vyner & Evans 1978, nos 8–10); although our jar may not have had a handle). Third to fourth century.
264. 327. Jar in light grey local fabric.
265. 327. Jar in BB1, burnt light grey in places. Faint signs of wavy-line decoration on the rim (cf. Gillam 1976; nos 1–2). Early to mid-second century.
266. 327. Tazza in fawn fabric burnt grey in places. See Caerleon, Prysgr Field (Nash-Williams 1932), nos 424–5 for the general type.
267. 327. Carinated bowl in mid-grey fabric with a light grey core and some burnishing externally.
268. 327. Flanged dish in BB1 (cf. Gillam 1976, no. 61). Mid-second century. (Not illustrated)
269. 328. Lid in grey local fabric with darker surface (cf. Whitton, Jarrett & Wrathmell 1981, no. 435). (Same as No. 479.)

Also present was a BB1 bowl base from 076, and substantial fragments of No. 267 from 328.

Phase 12

Only twelve vessels are represented. Of these, only two are illustrated, and only one, No. 271, appears to be chronologically significant.

270. 090. Ring-necked flagon in grey fabric with a cream slip. Fabric may originally have been orange, then burnt.
271. 117. Jar in BB1, probably a vessel such as Gillam (1976) no. 12. Early fourth century.

Phase 13

This phase produced nothing of chronological significance. A residual 'Malvernian' jar is illustrated, as these vessels seem uncommon at Loughor. Indeed, this is the only example in this fabric recognised from Site 57.

272. 014. Malvernian type jar; dark grey fabric with light grey core.

Phases 14 and 15 (post-fort and miscellaneous contexts)

Among a small collection of pieces from Phases 14 and 15 from unphased contexts come a few vessels otherwise not represented above.

273. 112. Jar in BB1, burnt buff externally (cf. Gillam 1970, no. 144). Probably third century. 274. 112. Tankard in dark grey fabric; the angle of the rim suggests a fourth-century date.

The context includes a grey jar, a BB1 flanged bowl, and a second-century BB1 jar.

275. 088. Dish in BB1 (cf. Gillam 1976, no. 83); dated by Gillam to the mid-fourth century, but an earlier date for the decoration seems more probable.

276. 027. Jar in light orange fabric. Double rims like this appear in the Severn Valley in the third and fourth century (Webster 1976, no. 9), see also Caldicot Kilns (Spencer in Vyner 1988, fig. 50).

277. 027. Flagon neck, now fawn with a grey surface coating (the result of subsequent burning in 1983).

278. 124. Jar in light grey Fabric *c* (see comment to No. 276).

279. 183. Jar in light grey fabric with rusticated decoration. Rustication was popular in the late first century and early second century (cf. Thompson 1958).

Site 53

The material from Site 53 represents the largest and most significant collection from the interior of the first fort. It is notable for the enormous preponderance of Flavian and Trajanic material and the relative sparsity of certainly later pieces. There can be little doubt, looking at this collection, that the site saw its major military activity in the pre-Hadrianic period. Material from Site 53 is summarised in the two tables below.

TABLE 26: SITE 53: ANALYSIS OF COARSE POTTERY BY FABRIC SOURCE

PERIOD	I		II		III		IV		V		VI		VII		VIII		IX		TOTAL	%age	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		
Fabric <i>a</i>	-	-	4	1	1	4	9	7	16	1	9	2	-	2	2	3	-	-	-	61	11
Fabric <i>b</i>	-	-	4	1	-	5	1	1	4	1	12	-	-	5	1	3	-	-	-	38	7
Fabric <i>c</i>	-	-	3	-	-	5	2	1	6	1	14	5	3	14	1	9	-	1	-	65	12
Other Oxidised	3	-	10	2	6	10	11	4	4	2	11	5	2	10	2	9	-	2	19	112	21
Other Reduced	3	-	10	-	1	8	11	13	12	5	16	11	5	13	-	13	2	23	48	195	36
BB1	-	-	-	-	2	-	1	3	3	1	4	3	1	6	4	1	1	5	4	39	7
'Malvern'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-
Caerleon	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	1	3
Severn Valley	-	-	1	-	-	1	-	1	-	-	-	-	2	1	-	-	-	-	-	6	1
Verulamium	-	-	-	-	-	-	-	1	-	-	-	-	-	1	1	-	-	-	1	4	1
'Terra Nigra'	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-
Argonne cc	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	1	-	3	1
Köln/Nene Valley cc	-	-	1	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-	-	4	1
Mosel cc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-
Gr. Glaze	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-
Eggshell	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-
TOTAL	6	-	33	4	10	33	35	32	45	11	70	26	16	52	13	40	3	33	73	535	99
%age	1	-	6	1	2	6	7	6	8	2	13	5	3	10	2	7	1	6	14	100	

TABLE 27: SITE 53; ANALYSIS OF COARSE POTTERY BY FORM AND FUNCTION

PERIOD	I		II		III		IV		V		VI		VII		VIII		IX		TOTAL	%age	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		
KITCHEN WARE																					
Jar	3	-	17	-	4	15	18	12	18	3	29	9	9	25	6	17	1	14	38	238	44
Bowl	1	-	5	1	-	6	7	5	8	4	12	4	1	9	2	9	2	10	15	101	19
Dish	1	-	2	-	-	3	4	1	5	2	2	3	3	4	2	5	-	1	1	39	7
Lid	-	-	3	1	-	4	4	6	11	1	17	4	-	8	-	5	-	3	11	78	15
Cheese-press	1	-	-	-	2	-	1	2	-	-	1	3	-	1	-	-	-	-	-	11	2
Colander etc.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	2	-
TABLE WARE																					
Flagon/jug	-	-	2	2	3	-	-	1	2	1	3	-	-	5	1	-	-	-	2	22	4
Beaker	-	-	2	-	-	1	-	2	-	-	5	-	1	-	1	1	-	2	2	17	3
Tankard/mug	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-	2	-	-	1	6	1
Jar	-	-	-	-	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	3	1
Bowl	-	-	1	-	-	-	1	1	1	-	-	-	-	-	1	1	-	3	1	10	2
Dish	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	-	-	1	4	1
OTHER																					
Tazza	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	-
Lamp	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Triple Vase	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
TOTAL	6	-	33	4	10	33	35	32	45	11	70	26	16	52	13	40	3	33	73	535	99
%age	1	-	6	1	2	6	7	6	8	2	13	5	3	10	2	7	1	6	14	100	

Phase 1

As one would expect from a primary level on the site, few vessels are represented (only six in all). It is noticeable that, as with similar levels on Site 57, no examples of Fabrics *a* or *b* were found. As already implied, this is presumably because Phase 1 pottery was brought to the site from outside before local suppliers, represented by Fabrics *a* or *b*, had time to commence production. The vessel with lattice decoration may be noted. Generally, in South Wales, it is assumed that lattice decoration appears in imitation of BB1 and, therefore, dates from the period of maximum importation of that ware from the Trajanic or Hadrianic period onwards. Clearly the Loughor evidence shows that this need not necessarily be the case and it may be that earlier BB1 vessels also found their imitators.

280. 1419. Jar in light grey fabric.

281. 1419. Jar in dark grey fabric with buff patches externally.

282. 2532. Cheese-press in an orange-to-buff fabric with a thin grey core, burnt light grey on the surface.

283. 2532. Dish in light brown fabric with a grey surface.

Also present was a vessel in a light orange fabric and orange surface, with lattice decoration scattered, throughout Phase 1 (rim fragment in 1419 and lattice decoration from 1527 and 1528).

Phase 3

In later first- and second-century assemblages, it is always difficult to distinguish the Flavian from the Flavian-Trajanic. There can be little doubt, however, on stratigraphic grounds, that Phase 3 is Flavian, and this is borne out by a number of vessels which, by their affinities, for instance with material from the Neronian fortress at Usk or with that from the earliest levels at Caerleon, are undoubtedly first-century in date. The possible waster, No. 293 from 1209, may be noted. If it is truly the same vessel as No. 292, then this carries with it the presumption that rusticated jars were being made at or very near Loughor. The Köln beaker fragment from 1440 may be noted. Colour-coated white wares are rare on British sites before the Antonine period and, at first sight, this might be thought to be intrusive. However, as TABLE 14 shows, Köln wares appear in virtually all periods at Loughor and there seems no reason to doubt that they are present from the Flavian period onwards.

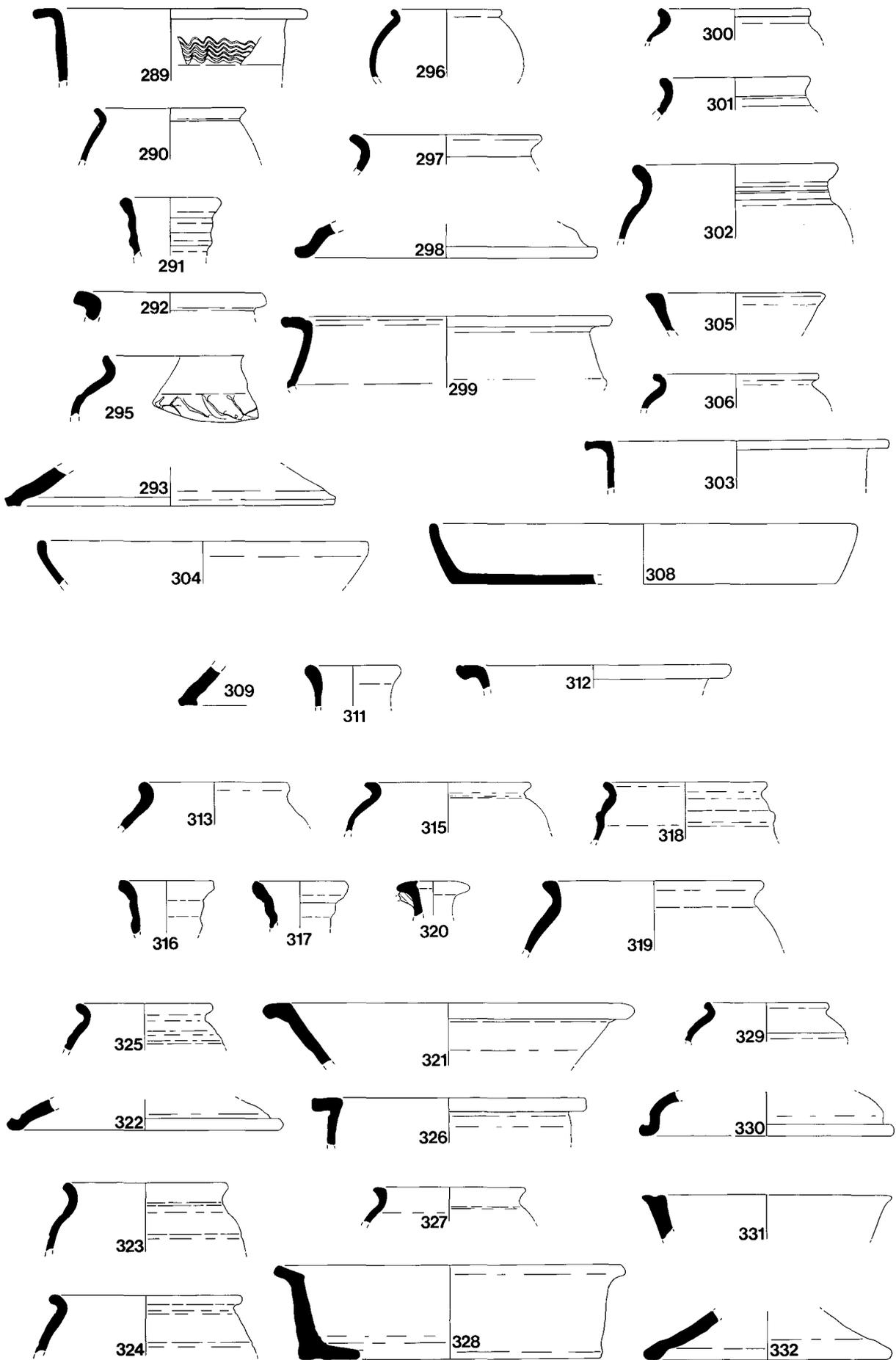


FIG. 129. Coarse pottery. Nos 289–293, 295–306, 308, 309, 311–313, 315–332 (1:4).

284. 585. Jar in a fabric varying from light grey to buff.
285. 786. Jar in light orange fabric burnt grey (cf. Green 1943, no. 20). Probably first century.
286. 786. Jar in orange fabric with grey core and interior (cf. Ling & Ling 1973, no. 21).
287. 786. Lid in light grey Fabric *a*.
288. 798. Flanged bowl in mid-grey fabric. Late first to early second century.
289. 798. Flanged bowl in light grey Fabric *c*. Wavy-line decoration appears to have been put on with a comb. Late first to early second century.
290. 887. Jar in light orange fabric, probably local.
291. 1090. Flagon in grey fabric with orange surface, a smaller version of No. 15.
292. 1139. Jar in buff Fabric *b*, probably from a vessel similar to Usk Fortress series type 11 (Manning 1981, 207; Manning 1993).
293. 1139. Lid in orange Fabric *b* burnt grey in places.
The context also includes three everted-rimmed jars, a flanged bowl, and a mortar-like bowl.
294. 1142. Rusticated jar in grey fabric. (Not illustrated)
295. 1209. Jar in hard mid-grey fabric, possibly the same vessel in No. 294. The vessel is overfired and distorted and could be a waster (cf. Gillam 1970, no. 97 for the general type). Another fragment came from 1227.
296. 1219. Small jar or beaker in pink to grey micaceous fabric.
297. 1219. Jar in pink/buff Fabric *b* burnt grey on the rim.
298. 1219. Lid, probably originally in orange local fabric, but now largely grey.
299. 1223. Flanged bowl in orange Fabric *c* with grey core and grey surface. One of the Flavian to Trajanic series.
300. 1266. Jar in light grey Fabric *c* (cf. Caerleon, Jenkins Field, Nash-Williams 1929, no. 17). Probably first century.
301. Jar in orange fabric with grey core and grey external surface.
302. 1266. Jar in light grey Fabric *a*. Another fragment of the same vessel came from 1162 (Phase 5).
303. 1266. Flanged bowl in light grey fabric, darker externally.
304. 1266. Probable dish in light orange Fabric *a*.
305. 1296. Vessel in pink fabric, burnt grey in places. There is a hole, perhaps for a rivet. Possibly from an open lamp (cf. Usk Fortress series Type 27, Manning 1981, 211; Manning 1993; and No. 343 below).
The context also includes some pieces with a linear rustication.
306. 1440. Jar in light orange/buff Fabric *a*, burnt grey in patches.
307. 1440. Small fragment of roughcast beaker in white fabric with dark grey/brown colour-coat probably from Köln (cf. Anderson 1981 fig. 19.1 nos 5–6). Anderson would date the types to late first to late second century. (Not illustrated).
308. 1841. Dish in light orange fabric with double groove internally on the smoothed base (cf. Usk Fortress series type 29, Manning 1981, 282; Manning 1883). Probably first century.

Phase 4

Only four vessels are represented. All are certainly Flavian or Trajanic and, on stratigraphic grounds, may be assumed to be the former.

309. 1168. Lid in fawn fabric – probably Fabric *a*.
310. 1232. Flagon in orange fabric with the even rings of first-century examples. (Not illustrated)
311. 1256. Flagon in light orange Fabric *b*.
312. 1288. Flanged bowl in light orange/buff fabric.

Phase 5

Both Phases 4 and 5 yielded a higher-than-average number of flagons. However, as both were relatively unproductive of pottery, it is difficult to decide if this is a chance by-product of statistically unviable totals or truly reflects a different character of occupation. Phase 5 is the earliest phase on Site 53 to contain BB1, but this probably only reflects the relatively small amounts of the ware reaching Loughor and has no chronological significance.

313. 1162. Jar in light grey Fabric *a*.

314. 1162. Cheese-press in orange to buff fabric. (Not illustrated)

The context includes a substantial fragment of No. 302.

315. 1829. Jar in micaceous light orange/brown fabric with grey core and grey patches externally.

316. 1837. Flagon in micaceous orange fabric with grey core. The upper ring is more prominent than on examples from Phase 3 and a later (perhaps late first- to early second-century) date is likely.

317. 1839. Flagon in cream fabric with pink core.

318. 1840. Jar in mid-grey fabric burnished externally. The extensive use of cordons suggests an origin well away from South Wales.

319. 1840. Jar in BB1.

320. 2506. Flagon in pink fabric with fawn surface.

Also present was a BB1 jar from 1174 and a cheese-press in pink fabric from 2290.

Phase 6

Among the coarse pottery, there is little diagnostic to differentiate the Phase 6 pottery from other Flavian and Trajanic products. A later Flavian date would not be unreasonable. The absence of BB1, although not diagnostic, is more probable in a Flavian rather than Trajanic context, given the overall number of vessels recovered. The triple vase fragment, No. 336, from 1799 may be noted. This is the only example of a triple vase recovered from the excavations. The possible 'second', No. 333, is also of interest.

321. 939. Flanged bowl in orange Fabric *b*.

322. 939. Lid in grey Fabric *c*.

The context included an orange dish with mica-dusted surface.

323. 1000. Jar in orange fabric.

324. 1000. Jar in grey Fabric *a* (Ling & Ling 1973, no. 24).

325. 1000. Jar in light grey fabric.

326. 1000. Flanged bowl in pink fabric with grey surfaces in places.

327. 1001. Jar in pink fabric with grey surface.

328. 1001. Flanged dish in orange/buff fabric, burnt after breakage. The dish form of the more common flanged and carinated Flavian/Trajanic bowl.

329. 1016. Jar in light brown fabric with light grey core and surface.

330. 1044. Lid in brown fabric with grey core and dark grey surface (cf. No. 165 above and a similar vessel in 1020).

331. 1047. Flanged dish in orange/buff fabric with grey core.

332. 1047. Lid in fawn Fabric *b*.

333. 1136. Jar in hard granular light grey fabric. Also a fragment from 999 which is distorted and may indicate that this is a 'second'.

334. 1206. Dish in orange/buff fabric, probably intended to be reminiscent of Samian Form 18 and first-century in date.

335. 1401. Jar in light grey Fabric *c* (cf. Ling & Ling 1973, no. 36).

336. 1799. Fragment of the ring base of a triple vase in light grey Fabric *a* with darker external surface. The seating for a vase survives and a hole connecting vase to base. (Not illustrated)

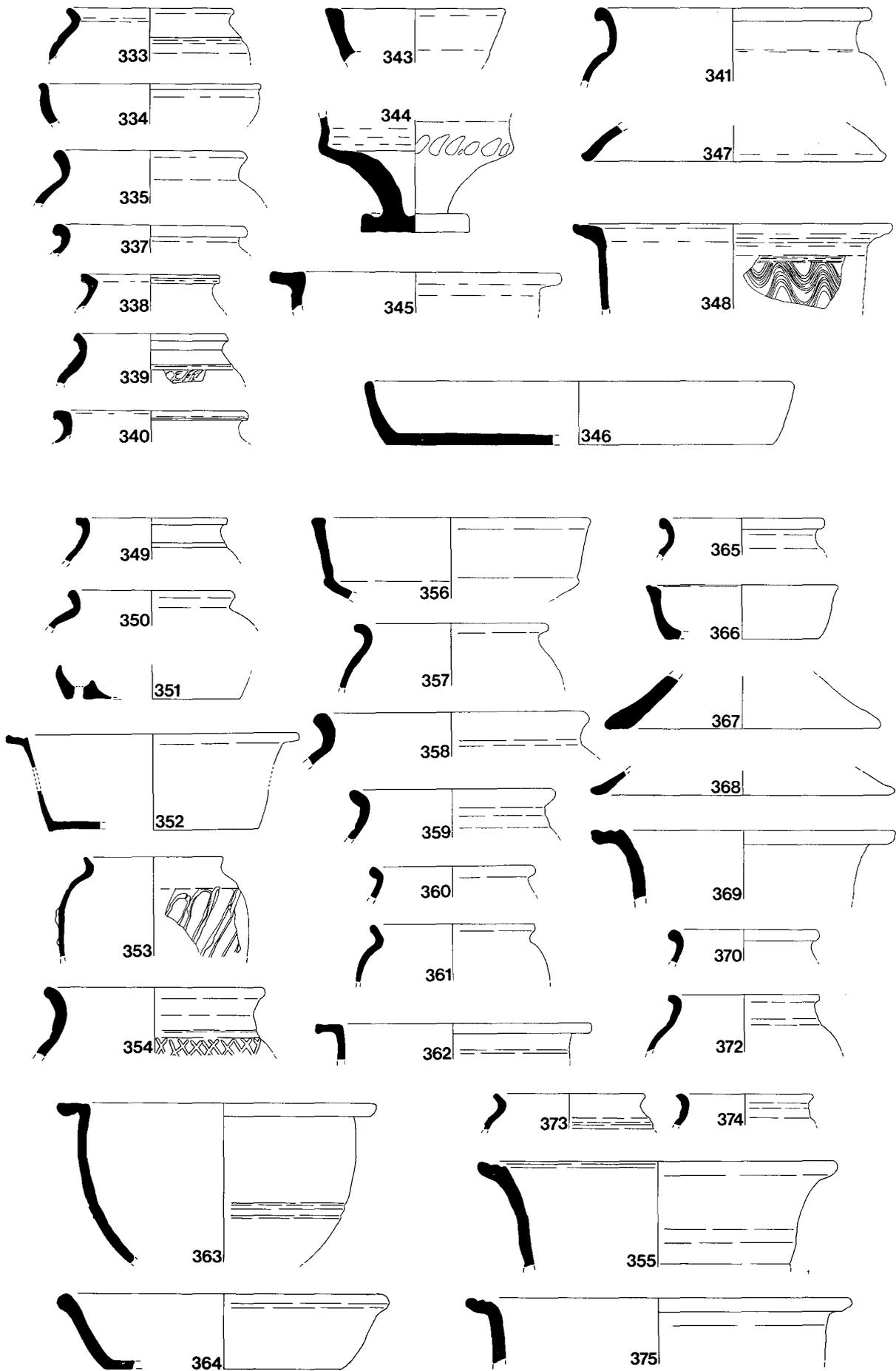


FIG. 130. Coarse pottery. Nos 333-335, 337-341, 343-370, 372-375 (1:4).

337. 1826. Jar in light orange fabric (cf. Usk Fortress series type no. 11, Manning 1981, 207, Manning 1993, and also Gillam 1970, no. 108).
338. 2279. Handled jar in grey fabric with cream to maroon surface. There are numerous fragments, all looking overfired. Too little of the upper part of this vessel survives to allow reconstruction.
339. 2279. Rusticated jar in light grey Fabric *a*.
340. 2279. Jar burnt pink to grey in either Fabric *a* or *b*, but probably originally *b*.
341. 2279. Jar in grey Fabric *c*.
342. 2279. Jar in light orange Fabric *b* with grey core. (Not illustrated)
343. 2279. Vessel in pink fabric, burnt grey in places. There are slight traces of a drilled hole and this may be a fragment of No. 305 above.
344. 2279. Tazza base in oxidised fabric, burnt grey in places after breakage (another fragment from 2280).
345. 2279. Flanged bowl in orange/buff Fabric *b*.
346. 2279. Dish in orange/buff fabric burnt light grey. The surface has been smoothed (cf. No. 308).
347. 2279. Lid in light grey Fabric *a*.
348. 3607. Flanged bowl in light grey Fabric *c*. Wavy-line decoration has probably been applied with a brush. (Probably same vessel as No. 442.)

Phase 7

There is little to distinguish material from Phase 7 from that of Phase 6 and a broadly similar date seems probable. The presence may be noted of jars with gently curving necks, a feature suggested as typical of later (i.e. Flavian-Trajanic) jars in the main fort.

349. 601. Jar in mid-grey fabric.
350. 601. Jar in mid-grey fabric.
351. 601. Jar in light grey fabric.
352. 601. Flanged dish in light orange/buff fabric with a grey core; a fragment of this vessel comes from 802.
The context includes a cheese-press (cf. No. 366).
353. 796. Jar in light grey Fabric *a* with darker surface and linear rustication apparently applied diagonally.
354. 796. Jar in light grey Fabric *a* with darker surface and lattice decoration on the shoulder.
355. 796. Flanged bowl in light grey Fabric *a* with darker surface.
356. 818. Carinated bowl in hard granular orange fabric.
357. 822. Jar in light orange fabric sooted on the rim (cf. Ling & Ling 1973, no. 31).
The context includes a grey jar with rouletted decoration.
358. 885. Jar in light grey Fabric *c*.
359. 903. Jar in light grey Fabric *a*.
360. 903. Jar in mid-grey fabric.
361. 944. Jar in light grey fabric with dark grey surface.
362. 944. Flanged bowl in light grey Fabric *a*.
363. 995. Flanged bowl in grey fabric.
364. 995. Dish in light brown/buff fabric.
The context includes some wares with rustication.
365. 996. Jar in light grey granular Fabric *c*.
366. 996. Small cheese-press in pink fabric. The base illustrated with this piece may be from the same vessel and comes from Phase 7 Context 601.
367. 996. Large lid in light grey Fabric *a*.
368. 996. Lid in grey fabric burnt pink and buff in places.
369. 997. Flanged bowl in fawn to grey Fabric *a*.
370. 999. Jar in grey fabric with darker surface.

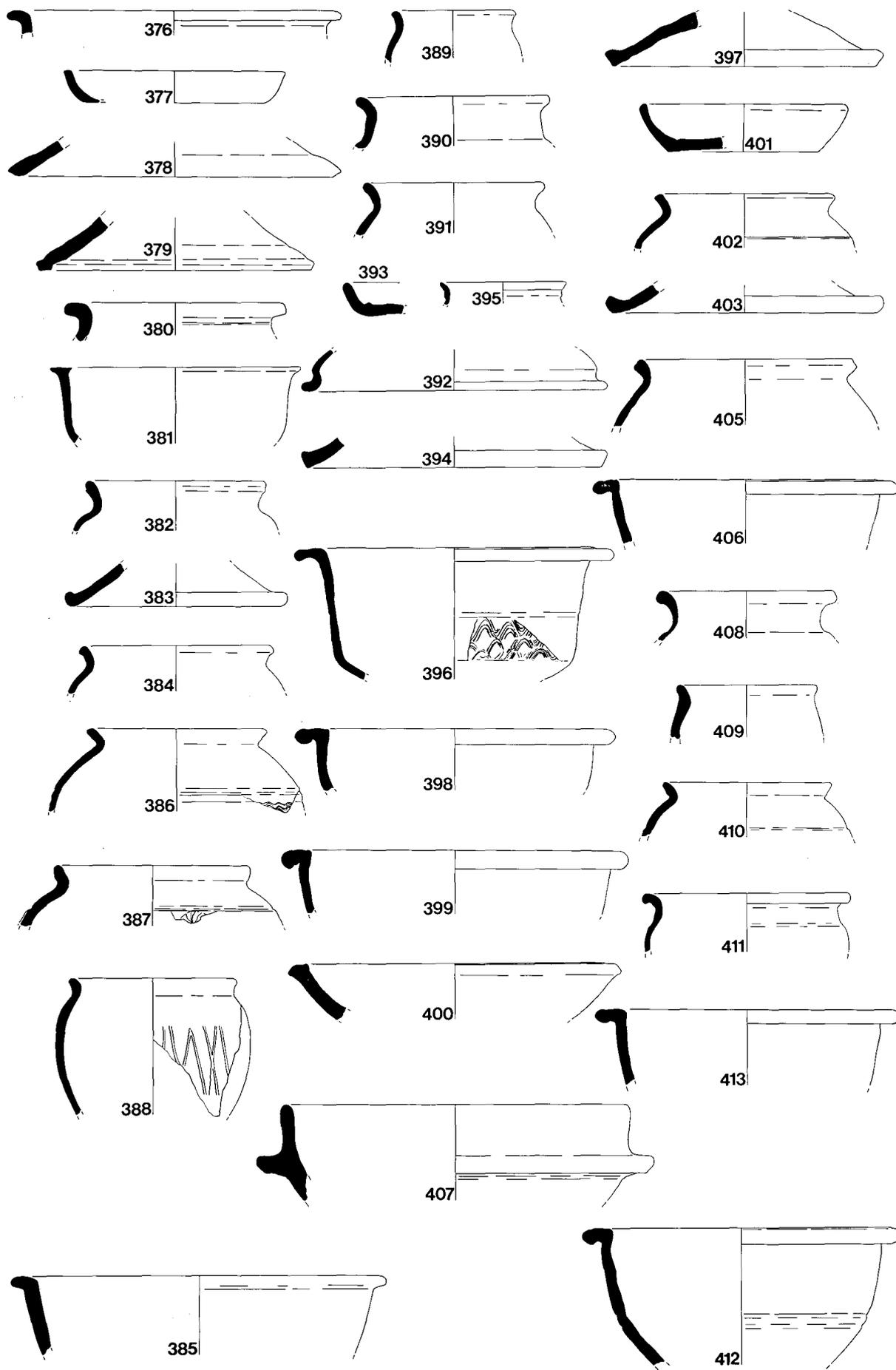


FIG. 131. Coarse pottery. Nos 376-403, 405-413 (1:4).

371. 999. As No. 370.
 372. 999. Jar in mid-grey fabric.
 373. 999. Jar in light grey Fabric *a*.
 374. 999. Jar in pink/buff fabric.
 375. 999. Flanged bowl in light grey Fabric *a* with darker surface.
 376. 999. Flanged bowl or dish in BB1.
 377. 999. Shallow dish in light grey fabric with darker surface.
 378. 999. Lid in light brown fabric with darker surface.
 The context includes a piece with rustication and a possible fragment of No. 333.
 379. 1014. Lid in orange fabric.
 380. 1020. Jar in light orange/buff Fabric *b*.
 The context includes a fragment of No. 330.
 381. 1558. Flanged bowl in orange fabric with a grey core.
 Also present was a vessel similar to No. 328 from 871.

Phase 8

Period IV–V levels, as a whole, seem to be characterised by the presence of slightly more BBI and this can certainly be seen on Site 53, where the Period IV–V Phases 8–12 yielded fourteen examples of the ware, compared with only three from the Period III Phases 4–7 (in percentage terms BB1 represents 3.7 per cent of all vessels in Period III, 7.8 per cent in Period IV, and 7.5 per cent in Period V). The pattern is set by Phase 8 with three BB1 vessels, as many as in the whole of Period III. The phase also contains a fragment of Argonne colour-coated ware, the earliest on the site and arguably the earliest from Loughor as a whole. With so few Argonne vessels represented at Loughor, it would be unwise to put too much weight on pieces such as this, but they may help to pinpoint the first appearance of the ware in South Wales.

382. 586. Jar in light grey fabric with orange and grey core.
 383. 586. Lid in light grey Fabric *a*.
 The context includes a fragment of cheese-press in light red fabric with black colour-coat, a fragment of a flagon from the Verulamium region, and a sherd of a roughcast beaker.
 384. 638. Jar in orange fabric, subsequently burnt in 1983.
 385. 638. Flanged bowl in BB1 (cf. Gillam 1976, no. 34). Another fragment in 787.
 386. 787. Everted-rimmed jar in light grey fabric with wavy linear decoration around the girth (cf. Nash Williams 1929, no. 34).
 387. 787. Everted-rimmed jar in light grey fabric with rusticated decoration.
 388. 787. Jar in BB1 (cf. Bidwell 1977, fig. 13.1 no. 9). Probably pre-Hadrianic.
 389. 787. Jar in BB1 (cf. Webster 1993, BB1, no. 3). First century.
 390. 787. Jar in light grey Fabric *a*.
 391. 787. Jar in light grey fabric.
 392. 787. Lid in dark grey fabric burnt brown on the upper surface.
 393. 802. Vessel in pink Fabric *b* burnt in places. Possibly an open mug.
 394. 802. Lid in light grey Fabric *a*.
 395. 820. Beaker in light grey fabric with darker surface.
 396. 821. Flanged bowl in light grey Fabric *c* (cf. Williams 1939, no. 3, from Coelbren).
 397. 865. Lid in light grey Fabric *a*.
 398. 866. Flanged bowl in fawn/grey micaceous Fabric *a*.
 399. 886. Flanged bowl in light grey fabric with darker surface.
 400. 886. Dish in light grey Fabric *a*. There is some resemblance to BB1 forms.
 401. 940. Dish in light grey Fabric *a* with darker surface possibly intended to be reminiscent of *terra nigra*.
 402. Jar in light grey fabric.

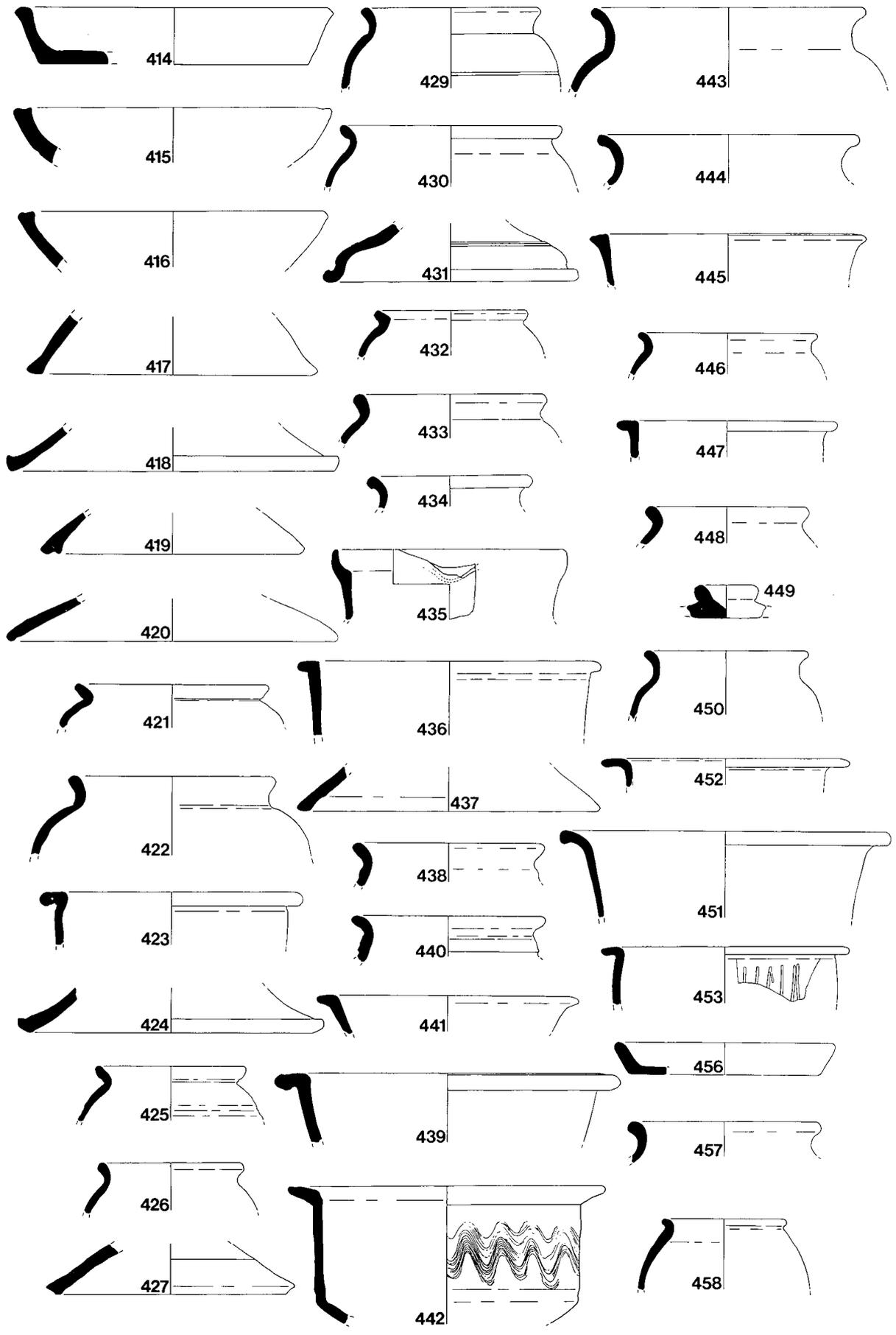


FIG. 132. Coarse pottery. Nos 414-427, 429-453, 456-458 (1:4).

Phase 9

The assemblage from Phase 9 is certainly Flavian-Trajanic in appearance. The gradual change in jar fashions, from a preponderance of everted rims in the Flavian period towards vessels with gently curving rims and those with high necks seems well under way by this time. Among the flanged bowls, there are a number with short plain flanges which may owe something to the BB1 bowl normally associated with the second century and which, in developed form, can hardly be earlier than the late first century. A Trajanic date for Phase 9 would not seem unreasonable.

Of forty-five vessels represented, eleven are lids (24 per cent of vessels in this phase). Across all phases and sites lids represent only 9 per cent of all vessels. Dishes also seem unduly well represented in this phase (five vessels or 11 per cent against 5 per cent across all sites). In the case of lids, at least, this appears to be a general feature of the site throughout the whole of Periods IV–V, for if we add all lids for Phases 8–12 we find a total of 39 out of 184 vessels or 21 per cent, significantly above the general average. Is it too much to propose some change in culinary habits or procedures on Site 53 in Periods IV–V?

403. 593. Lid in light grey Fabric *a*.

404. 594. Jar in BB1, almost certainly a fragment of No. 577. (Not illustrated)

405. 594. Jar in light grey Fabric *a*.

406. 603. Flanged bowl in grey fabric.

407. 603. Flanged bowl in grey Fabric *a* with coarse inclusions (cf. Ling & Ling 1979, no. 19 Phase VI). Fragments of this vessel came from 585.

The context also includes an orange base cut down for use as a lid.

408. 660. Jar in grey fabric with orange core, burnt on the rim.

409. 660. Jar in BB1 burnt grey and orange (Bidwell 1977, no. 2). Perhaps first century.

410. 764. Everted-rimmed jar in light grey fabric.

411. 764. Jar in grey fabric with brown core.

412. 764. Flanged bowl in light grey Fabric *a*.

413. 764. Flanged bowl in light grey Fabric *a*.

414. 764. Dish in light grey Fabric *a*.

415. 764. Dish in light grey Fabric *a* with darker surface.

416. 764. Dish in light grey Fabric *a*.

417. 764. Lid in light brown fabric (? burnt Fabric *a*).

418. 764. Lid in light grey Fabric *a*; one of two similar vessels.

419. 764. Lid in light grey Fabric *c*.

420. 764. Lid in BB1 (cf. Holt, Grimes 1930, no. 100; Wallace and Webster 1989).

The context includes the base of an orange jar, which joins fragments from 802.

421. 816. Everted-rimmed jar in grey fabric.

422. 889. Jar in grey Fabric *a* but with added sandy filler.

423. 889. Flanged bowl in coarse grey Fabric *c*, burnt fawn.

424. 889. ?Lid in fawn Fabric *b* but with added sandy filler.

425. 891. Everted-rimmed jar in brown fabric with grey core and mid-grey surface, burnt externally.

426. 891. Jar in light grey Fabric *a*.

427. 891. Lid in orange Fabric *b*.

428. 988. Flagon in light orange/buff Fabric *b* (cf. Ling & Ling 1973, no. 49). (Not illustrated)

429. 1002. Jar in light grey Fabric *c*.

430. 1002. Jar in light grey fabric; Ling & Ling (1973), no. 31, is of the same general type.

431. 1002. Lid in light brown fabric with grey core and dark grey surface (cf. No. 390). This is a popular lid form at Loughor (cf. Ling & Ling 1973, no. 59); see also No. 482.

432. 1148. Jar in light grey Fabric *a*.

433. 1822. Jar in grey fabric.

434. 1822. Jar in grey fabric with black surface burnished externally.

435. 2284. Jug in light grey Fabric *a*. There is a joining fragment from 2085.

436. 2284. Flanged bowl in BB1, possibly pre-Hadrianic as Bidwell (1977), no. 26.
 437. 2352. Lid in creamy grey Fabric *a*.
 438. 2354. Jar in light orange Fabric *b*.
 439. 2354. Flanged bowl in light grey Fabric *a* with darker surfaces.
 440. 2355. Jar in light grey Fabric *a*.
 441. 3477. Flanged dish in light grey Fabric *c*.
 442. 3602. Flanged bowl in light grey Fabric *c* with wavy-line decoration probably applied with a brush.
 The context includes a probable jar in a grey fabric with lattice decoration.
 443. 3612. Jar in grey fabric.
 444. 3612. Jar in light grey Fabric *c*.
 445. 3612. Dish in light grey fabric.

Phase 10

Only eleven vessels are represented in Phase 10 and these do little more than reinforce the general pattern of Period V material.

446. 613. Jar in BB1 (cf. No. 577).
 447. 3306. Flanged bowl in light grey fabric. There is some similarity to BB1 forms.
 448. 3614. Jar in light orange Fabric *b*.
 449. 3614. Fragment in light grey Fabric *c* with one light brown surface. Probably the handle of a lid.
 450. 3641. Jar in grey fabric burnished externally and with lattice decoration.
 451. 3641. Bowl in light grey Fabric *c*.
 452. 3641. Flanged bowl in light orange fabric.
 453. 3641. Flanged bowl in light grey fabric with burnished decoration externally.
 454. 3641. Dish in light grey Fabric *a*, possibly from a vessel such as Ling & Ling (1973), no. 17.
 455. 3641. Dish in light grey fabric.

Phase 11

The large number of lids from this phase (seventeen out of seventy vessels represented, or 24 per cent of all vessels in the phase) has already been commented on in the context of the whole of the Periods IV–V (see Phase 9 above). There seems no reason to suppose that the phase is significantly later than Phases 8–10. There is a fragment of beaker in light red with red colour-coat from 2300; this is presumably a Caerleon ware product and represents the earliest appearance of the ware on the site.

456. 339. Shallow dish in light grey Fabric *c*.
 457. 582. Jar in light grey Fabric *a*.
 458. 582. Jar in light brown Fabric *a* with a grey core.
 The context includes a roughcast beaker in thin orange fabric, probably from North Gaul.
 459. 583. Jar in hard light grey Fabric *c*.
 460. 583. Lid in BB1 with zig-zag decoration on the underside (cf. No. 420).
 461. 584. Jar in orange/buff Fabric *b*, burnt externally.
 462. 584. Jar in light grey fabric with wavy-line decoration, probably applied with a comb.
 463. 584. Jar in light grey fabric with darker surfaces (cf. Ling & Ling 1973, no. 36).
 464. 584. Jar in light grey Fabric *c*; of the same general type as No. 463.
 465. 584. Jar in grey Fabric *c*. One of three similar examples.
 466. 584. Jar in light grey Fabric *c*.
 467. 584. Small jar in very light grey Fabric *a* with grey and dark grey inclusions.
 468. 584. Jar in light grey fabric (cf. Ling & Ling 1973, no. 25).

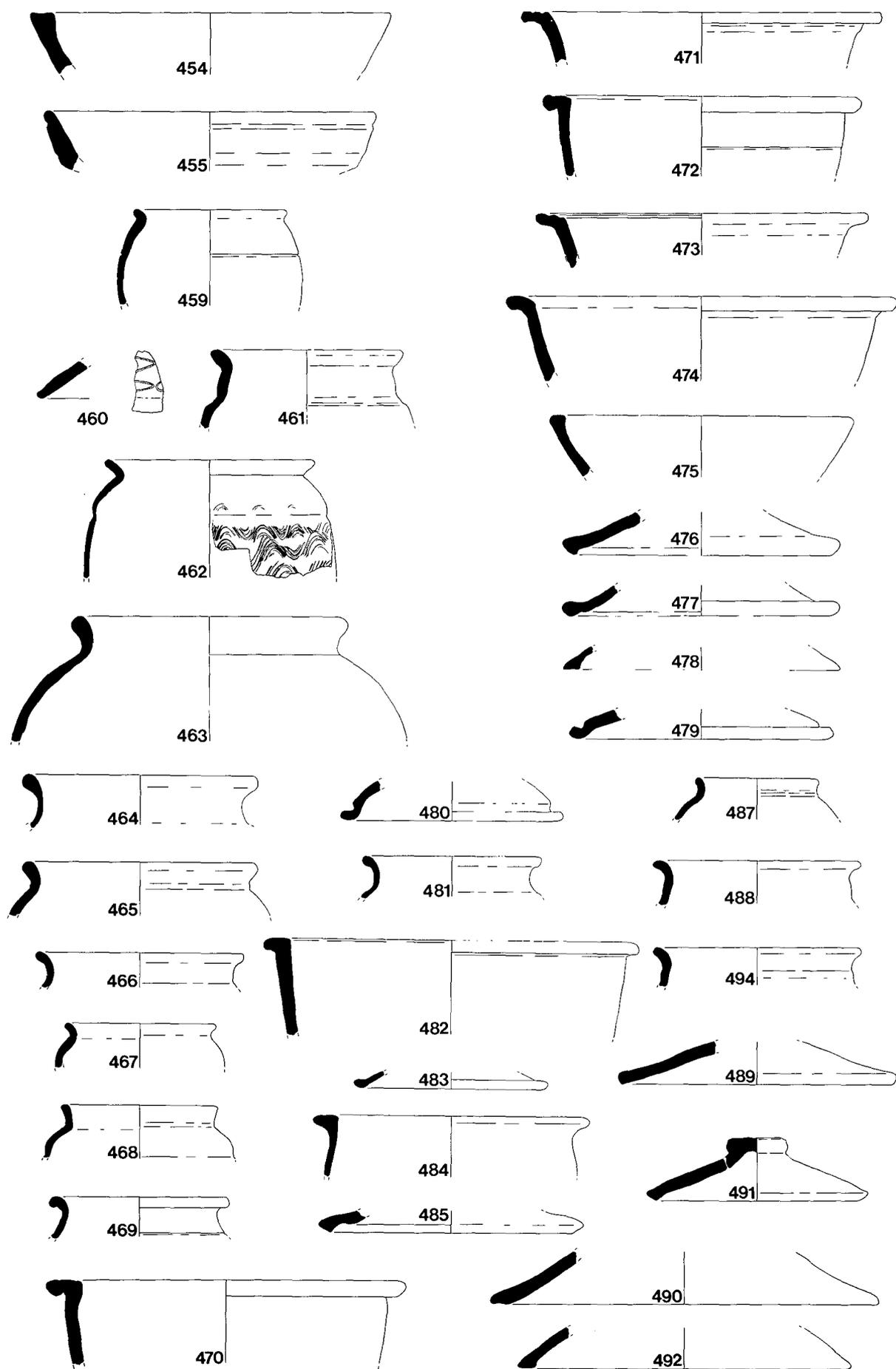


FIG. 133. Coarse pottery. Nos. 454, 455, 459-485, 487, 488, 490-492, 494 (1:4).

469. 584. Jar in grey fabric (cf. Ling & Ling 1979, no. 5).
470. 584. Flanged bowl in coarse pink to grey Fabric *b*.
471. 584. Flanged bowl in fine light grey Fabric *a*.
472. 584. Flanged bowl in grey Fabric *c*.
473. 584. Flanged bowl in light grey Fabric *b*.
474. 584. Flanged bowl in orange Fabric *b*. One of two orange flanged bowls.
475. 584. Dish in light grey Fabric *c* (cf. Ling & Ling 1973, no. 17).
476. 584. Lid in light grey Fabric *c*.
477. 584. Lid in light grey Fabric *c*.
478. 584. Lid in light grey Fabric *b*.
479. 584. Lid in grey fabric (cf. Ling & Ling 1973, no. 59).
480. 584. Lid in brown Fabric *c* with dark grey surface (cf. No. 407).
The context includes fragments of No. 595.
481. 604. Jar in light grey fabric.
482. 604. Bowl in BB1 (cf. Bidwell 1977, nos 24–6).
483. 604. Lid in orange/buff Fabric *b*.
484. 605. Flanged bowl in light grey Fabric *c*.
485. 608. Lid in orange/buff Fabric *b*.
486. Number not used.
487. 2035. Jar in light grey Fabric *a* with slight corrugations on the neck. It could be derived from mid-first-century types, as Usk Fortress series type 12 (Manning 1981 & 1993).
488. 2035. Jar in light grey fabric.
489. 2035. Lid in buff Fabric *b*.
490. 2035. Lid in light red fabric. There are also fragments in 2238.
491. 2035. Lid in orange/buff Fabric *b*. There is a possible fragment from 2241.
492. 2035. Lid in light grey Fabric *a*.
The context includes a fragment of a tazza.
493. 2085. Beaker in buff to pink fabric with grey/brown colour-coat and roughcast decoration; probably a Köln product (cf. Anderson 1981, fig. 19.1, nos 5–6). (Not illustrated)
494. 2085. Jar in light grey fabric.
495. 2085. Flanged bowl in orange/buff Fabric *b*.
The context includes a fragment of No. 435.
496. 2155. Lid in fawn fabric with grey upper surface.
497. 2225. Jar in light grey Fabric *c*.
498. 2237. Cheese-press in light red Fabric *b*.
499. 2255. Jar fabric with grey core.
500. 2255. Jar in light orange/buff Fabric *b*.
501. 2280. Jar in grey Fabric *c*.
The context includes part of No. 344.
502. 2300. Beaker in white fabric with grey colour-coat and roughcast decoration; probably a Köln product. The shape resembles Anderson (1981) fig. 19.1, no. 2, but the vessel is presumably contemporary with her no. 5. Late first to mid-second century.
The context included a fragment of a beaker which appears originally to have been light red with a red colour-coat. (Not illustrated)
503. 3281. Jar in light red fabric burnt on the rim.
504. 3326. Flanged bowl in grey Fabric *b*.
The context included an orange/red flagon fragment.
505. 3333. Jar in light grey Fabric *a*.
506. 3333. Flanged bowl in dark grey Fabric *c* with oxidised core.
507. 3355. Everted-rimmed jar in light brown fabric with dark grey core.
508. 3468. Flagon in light red fabric with orange surface; the even rings suggest a first-century date. The fabric is overfired. Other fragments in 3387 and 3482. (Not illustrated)

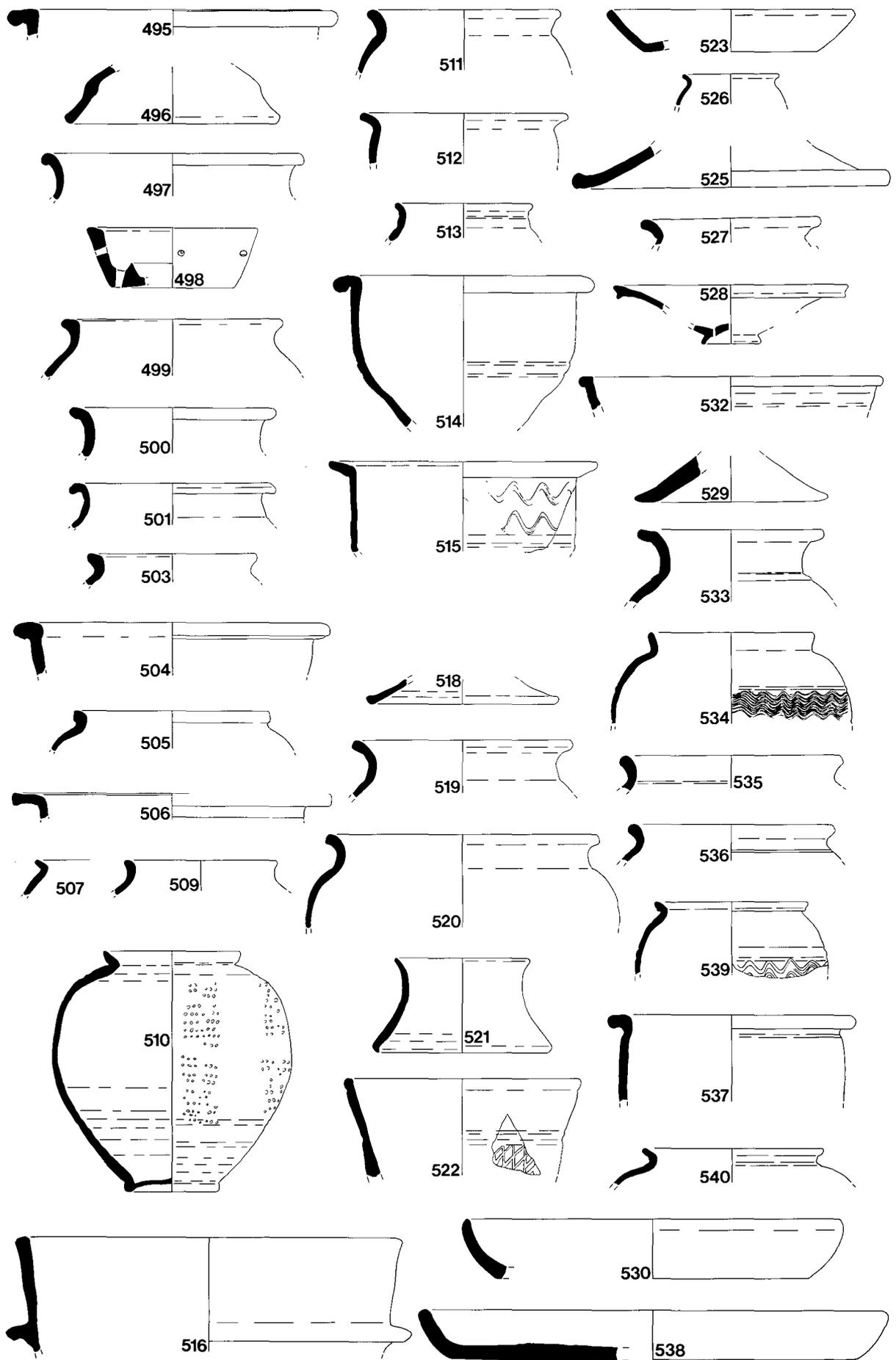


FIG. 134. Coarse pottery. Nos 495–501, 503–507, 509–516, 518–523, 525–530, 532–540 (1:4).

509. 3474. Jar in light grey fabric (cf. Caerleon, Jenkins Field, Nash-Williams 1929, nos 15–17). Probably Flavian and residual in this context.

Phase 12

The twenty six vessels seem consistent with a pre-Hadrianic date, but do not lend themselves to greater precision.

510. 310. Everted-rimmed jar in grey fabric with oxidised core. The external surface was originally darker and is decorated with applied dots (for the general type see Gillam 1970, no. 68). Late first to early second century.
511. 310. Jar in BB1 (cf. Gillam (1976) no. 1).
512. As No. 511.
513. 310. Jar originally in buff fabric, subsequently burnt in 1983.
514. 310. Flanged bowl in dark grey fabric. There is another fragment in 357.
515. 310. Flanged bowl in dark grey Fabric *c*.
516. 310. Flanged bowl in Fabric *a*, subsequently burnt in 1983 but probably originally grey. The similarity to Samian Form 38 is probably fortuitous.
517. 310. Lid in grey fabric with pink and dark grey core.
518. 310. Lid in orange/grey fabric, subsequently burnt in 1983.
519. 377. Jar in light grey fabric.
520. 2034. Jar in light grey Fabric *c*, as from Whitton (Jarrett & Wrathmell 1981, no. 137).
521. 2034. Jar in light grey Fabric *a* with darker surface. The form appears to be related to the thin *terra nigra* vessel Camoludunum (Hawkes & Hull) 1947, no. 120a; Greene (1979) fig. 52, 1–8. Our vessel is not in *terra nigra* and could be a local imitation. Probably Flavian.
522. 2034. Vessel in dark grey fabric burnished externally. Probably a tankard and related to the Severn Valley vessels (Webster 1976, no. 39). Probably second century.
523. 2034. Dish in grey Fabric *c*.
524. 2034. Cheese-press in orange/buff fabric. (Not illustrated)
525. 2034. Lid in light orange fabric. Probably oxidised Fabric *c*.
526. 3137. Beaker in fine thin grey fabric.
527. 3137. Jar in light grey Fabric *c*.
528. 3168. Vessel in hard mid-grey fabric tinged with orange. It is coloured cream on the interior of the base. Despite the lid-like appearance the holes pierced through the base suggest that this acted as a sieve. Other fragments come from 3126 and 2931.
529. 3179. Lid in fawn/grey fabric. There is another fragment in 3292.
530. 3298. Dish in light grey fabric (cf. Caerleon, Nash-Williams 1932, no. 322).
531. 3372. Jar in light red fabric. (Not illustrated)
532. 3372. Flanged bowl in dark grey, granular fabric, probably BB1. There is another fragment in 3293.

Also present was a substantial piece of No. 514 from 357, a base of a grey jar with lattice decoration from 421, and other fragments of No. 508 from 3387 and 3482.

Phase 13

It may be of significance that of only sixteen vessels present, two are probably from Caerleon, a glazed fragment, No. 543 from 3293, and a roughcast beaker in Caerleon ware from the same context. Elsewhere (Boon 1966; Webster 1993, 256) it is argued that Caerleon ware first appears *c.* 110. At Loughor it is extremely rare, but two of the five vessels represented come from contexts which are likely to be Trajanic, the fragment of probable Caerleon beaker from Phase 11 mentioned above, and the vessel below from 3293, from the very beginning of Period VI. It is tempting to see both as early products of the Caerleon ware kilns.

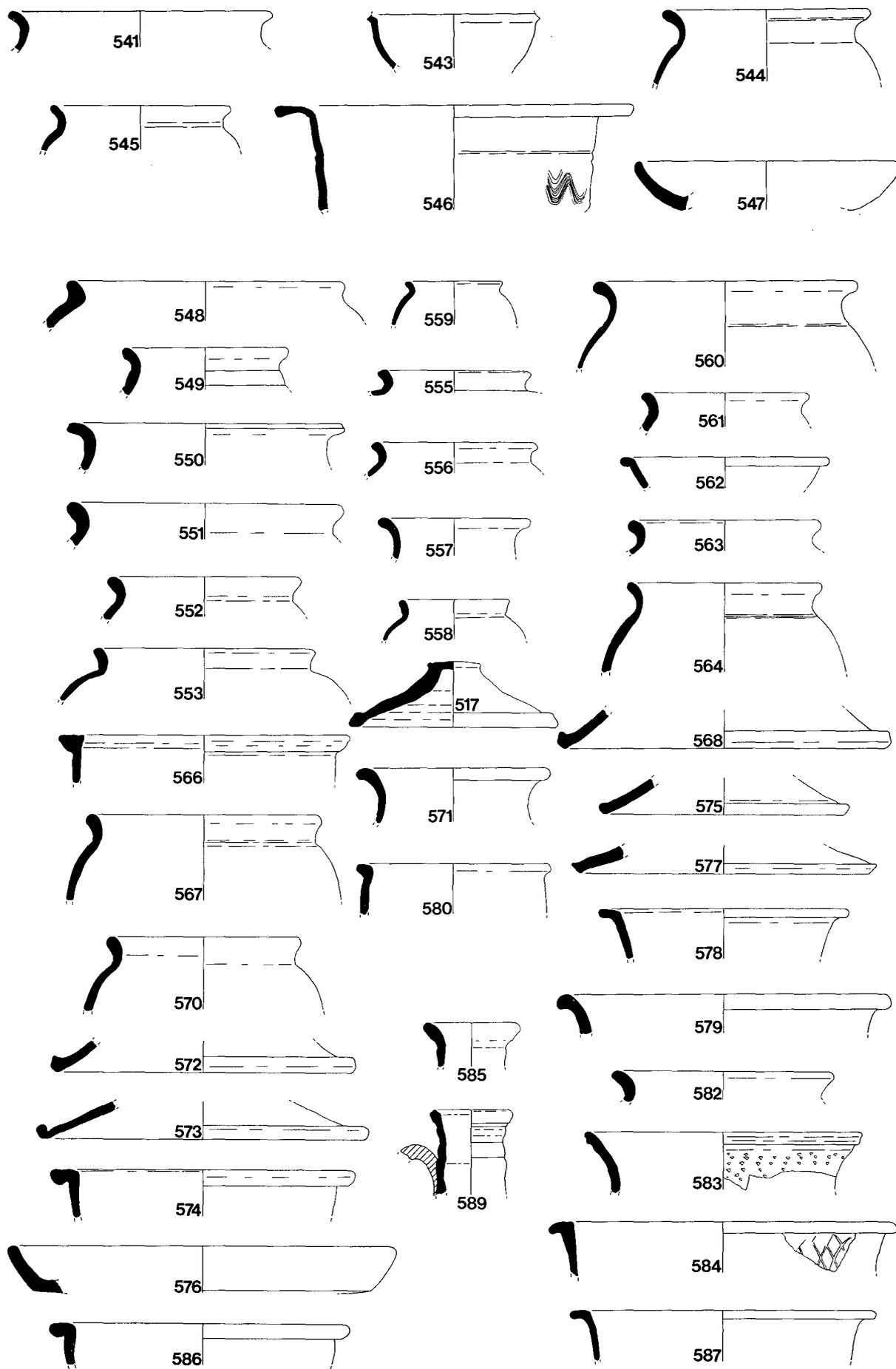


FIG. 135. Coarse pottery. Nos 517, 541, 543-553, 555-564, 566-568, 570-580, 582-587, 589 (1:4).

533. 2014. Jar in orange/buff fabric with grey core in places. Severn Valley ware (cf. Webster 1976, no. 1).
534. 2014. Everted-rimmed jar, light brown externally and dark grey internally. Ling & Ling (1973), no. 48 is of the same general type.
535. 2014. Jar in light grey fabric.
536. 2027. Jar in orange/buff fabric with fragments in 2022.
537. 2027. Flanged bowl in light orange oxidised Fabric *c* (cf. Ling & Ling (1979, no. 20).
538. 2027. Dish in light grey fabric.
539. 3276. Everted-rimmed jar in light grey Fabric *c* (cf. No. 532). There is another fragment in 3292.
540. 3292. Jar in light grey fabric.
541. 3292. Jar in dark grey fabric.
The context includes a fragment of No. 539 and a fragment of No. 530.
542. 3293. Fragment of roughcast beaker in light orange/red fabric with orange/brown colour-coat. A Caerleon product. Early second century or later. (Not illustrated)
543. 3293. Jar fragment in grey fabric with applied strip decoration and light to mid-green glaze (cf. Arthur 1978).
544. 3293. Jar in light grey fabric.
545. 3293. Jar in light grey Fabric *c*. Reminiscent of early jars in BB1.
546. 3293. Flanged bowl in light grey fabric. The wavy-line decoration was probably applied with a brush.
547. 3293. Dish in granular pink fabric.
The context includes a fragment of No. 532.

Phase 14

A dearth of everted-rimmed jars may be noted, helping to confirm the contention that these tend to be Flavian rather than later. There are six BB1 vessels out of an assemblage of 52 (11 per cent and slightly below the average for the whole of Period VI, which is 13.5 per cent). Nevertheless the overwhelming impression gained from looking at this collection is one of a pre-Hadrianic assemblage and a Trajanic or Trajanic/early Hadrianic date seems probable. The possible waster, No. 565, may be noted.

548. 079. Jar in light orange fabric, subsequently burnt in 1983 (cf. Ling & Ling 1973, no. 33).
549. 103. Necked jar in light orange Fabric *b*, subsequently burnt in 1983 (cf. Ling & Ling 1973, no. 19).
550. 103. Jar in light grey Fabric *c*.
551. 126. Jar in light grey fabric (cf. Ling & Ling 1973, no. 220).
552. 126. Jar in light brown fabric of the same general type as No. 549. Probably oxidised Fabric *c*.
553. 128. Jar in light grey fabric.
554. 128. Jar in light grey Fabric *c* with sandy filler. The fabric is much less hard than No. 553 and contains plentiful grey and brown filler but the form is very similar. (Not illustrated)
555. 128. Jar in light grey fabric. The rim appears to be distorted and this could be a 'second' or even a waster.
556. 157. Jar in light orange fabric, subsequently burnt in 1983.
557. 195. Jar in light grey fabric.
558. As No. 557.
559. 201. Jar in light grey Fabric *b*.
560. 236. Jar in light grey Fabric *c* (cf. Ling & Ling 1979, no. 12).
561. 236. Jar in BB1 (Gillam 1976, no. 1). Probably early second century. In this context, a non-joining sherd shows lattice decoration with an upper acute angle of only 20 degrees.
562. 236. ?Lid in light grey Fabric *c* with a dark grey external surface.
563. 307. Jar in smooth light grey fabric.

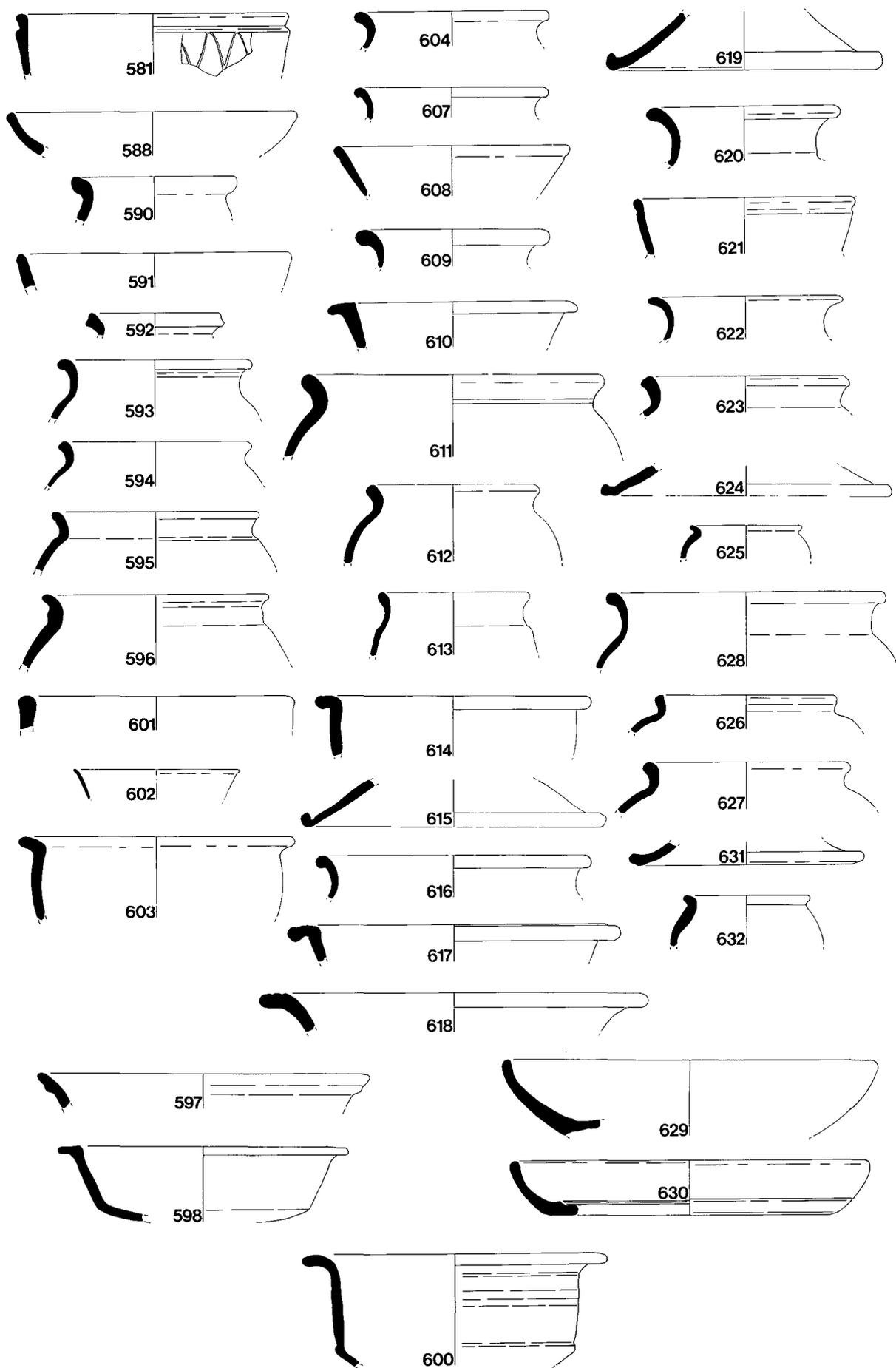


FIG. 136. Coarse pottery. Nos 581, 588, 590-598, 600-604, 607-632 (1:4).

564. 313. Jar in mid-grey fabric burnished externally and on the rim.
565. 313. Jar in light grey fabric. The rim is very distorted and this must have been a 'second', if not a waster. (Not illustrated).
The context included a probable Verulamium region flagon.
566. 314. Flanged vessel in light grey Fabric *c*, subsequently burnt in 1983. Perhaps a flagon neck.
567. 336. Jar, probably originally oxidised, but subsequently burnt in 1983. Also another fragment from 2920.
568. 1946. Lid in micaceous pink Fabric *c* with grey core.
569. 1854. Jar in light orange fabric (cf. Webster 1976, no. 1). Possibly the same vessel as No. 533. (Not illustrated)
570. 1955. Jar in fawn fabric; another fragment in 2965.
571. 1956. Jar in light grey Fabric *c*.
572. 1956. Lid in pink fabric.
573. 1956. Lid in light grey Fabric *c*.
574. 1960. Flanged bowl in grey/brown fabric.
575. 1960. Lid in light orange Fabric *b*.
576. 1964. Dish in light grey fabric with darker rim.
577. 1994. Lid in light orange Fabric *b*.
578. 2920. Flanged dish in light grey Fabric *c*, perhaps originally with a smooth grey external surface.

The context included a fragment of No. 567.

579. 2965. Wide-mouthed jar in light grey Fabric *c*.
580. 2965. ?Jar in grey Fabric *c*.
581. 2965. Bowl in BB1.

The context includes a fragment of No. 570.

582. 3131. Jar in BB1, burnt light grey (cf. Gillam 1976, no. 1).
583. 3131. Bowl in light grey Fabric *c* with crude rouletted decoration.
584. 3131. Flanged bowl in BB1 (cf. Gillam 1976, no. 34).
585. 3167. Ring-necked flagon in light orange Fabric *b*. The prominent upper ring suggests a second-century date.
586. 3167. Flanged bowl in light grey Fabric *a*.
587. 3167. Flanged bowl in light grey fabric with darker surface.
588. 3167. Dish in light grey Fabric *c* with darker surface.
589. 3313. Ring-necked flagon in light orange fabric with grey surface. The even rings suggest a first-century date.
590. 3313. Flanged jar or flagon in Fabric *a*; similar to No. 566.

Phase 15

The thirteen vessels from this phase do not contradict suggestions as to the date of Period VI as noted in Phases 13–14 above, but can do little to amplify them.

591. 088. Dish in BB1.
592. 172. Flagon rim in an off-white granular fabric probably from the Verulamium region. A vessel related to Frere (1972) no. 580 (redated in Frere 1984 to *c.* 130–200) is possible but an earlier date, more closely paralleled to that of Verulamium mortaria on the site, is more likely.
593. 172. Jar in light grey Fabric *a*; similar to No. 560.
594. 172. Jar in light brown fabric.
595. 172. Jar in BB1 (cf. Gillam 1976, nos 1–2).
596. 172. Jar in BB1 (Bidwell 1977, fig. 13.1, no. 7). Probably first to early second century.
597. 172. Bowl in light grey Fabric *a*; of the same general type as No. 581.
598. 172. Flanged dish in light grey Fabric *c* (cf. No. 587).

599. 172. Mortar like bowl in orange buff Fabric *b*. (Not illustrated).
 600. 180. Flanged bowl in light grey Fabric *c*, subsequently burnt in 1983.
 601. 192. Jar in dark grey/brown fabric of Malvernian type (cf. Peacock 1957, fig. 1 no. 3).
 602. 200. Cup in thin 'egg shell' pink/buff fabric with light buff surface. The ware is generally attributed to Caerleon (see Greep 1986, 63). But it is closely similar to one found at Holt (Grimes 1930, 163–4 & 213, no. 171). It is so exotic when compared to others at either centre that one wonders if a non-local source should be sought.

Phase 16

Viewed as a whole, the collection from Phase 16 contains many pieces which could be Trajanic. There are, however, one or two indicative of a later date. The tankard, No. 608, from 153 is sufficiently flared to be third- or fourth-century. Context 1911 contains a flanged bowl (unfortunately not illustratable) apparently reminiscent of Samian Form 38, a predominantly Antonine form but, of course, particularly popular in colour-coated form in the third and fourth centuries and imitated then in other fabrics. The almost total absence of Black-burnished ware (one vessel out of forty from the phase) is hard to explain but is probably best seen as an unusually low representation of the ware among the Trajanic vessels. Most of the Phase 16 assemblage seems best regarded as residual material from Period VI. The few later pieces must date the robbing and ditch construction. Although too few for any certainty, a third- or fourth-century date seems most likely.

603. 072. Jar in light orange fabric apparently covered in mortar after breakage.
 604. 072. Jar in dark grey fabric.
 605. 119. Flanged ?bowl in light grey fabric, subsequently burnt in 1983. (Not illustrated)
 606. 119. Bowl in light orange/buff fabric, subsequently burnt in 1983. (Not illustrated)
 607. 153. Jar in light grey fabric.
 608. 153. Tankard. The fabric may originally have been grey but was subsequently burnt in 1983. A local imitation of a Severn Valley vessel is likely (cf. Whitton, Jarrett & Wrathmell 1981, nos 586–7).
 609. 209. Jar in mid-grey fabric burnished on the rim.
 610. 209. Flanged bowl in BB1, subsequently burnt in 1983.
 611. 1906. Jar in light grey Fabric *a* (cf. Ling & Ling 1979, no. 16).
 612. 1906. Jar in hard mid-grey fabric with ?crushed stone inclusions.
 613. 1906. Jar in light grey to fawn Fabric *c*.
 614. 1906. Flanged bowl in light brown Fabric *b* with added sandy filler.
 615. 1906. Lid in light grey Fabric *c*.
 616. 1910. Jar in light grey Fabric *b* (cf. Ling & Ling 1979, no. 5).
 617. 1910. Flanged bowl in light grey fabric.
 618. 1910. Flanged bowl in orange/buff Fabric *b*.
 619. 1910. Lid in light orange Fabric *c*, burnt grey and pink in places.
 620. 1911. Jar in light grey Fabric *c*, discoloured light brown externally.
 The context includes a flanged bowl reminiscent of Samian Form 38.
 621. 1921. Tankard in mid-grey fabric (cf. No. 608).
 622. 1943. Jar in light grey Fabric *c* with darker external surface.
 623. 1943. Jar in light grey Fabric *c*.
 624. 1943. Lid in light brown fabric.
 625. 1979. Small jar in orange fabric.
 626. 1986. Everted-rimmed jar in light brown fabric apparently burnt dark grey internally. One of the few everted rims from later phases.
 627. 1986. Jar in light grey Fabric *c*.
 628. 1993. Jar in light grey Fabric *c*.
 629. 1993. Dish in light grey Fabric *a* with filler of light brown ?burnt clay and a few stone fragments.

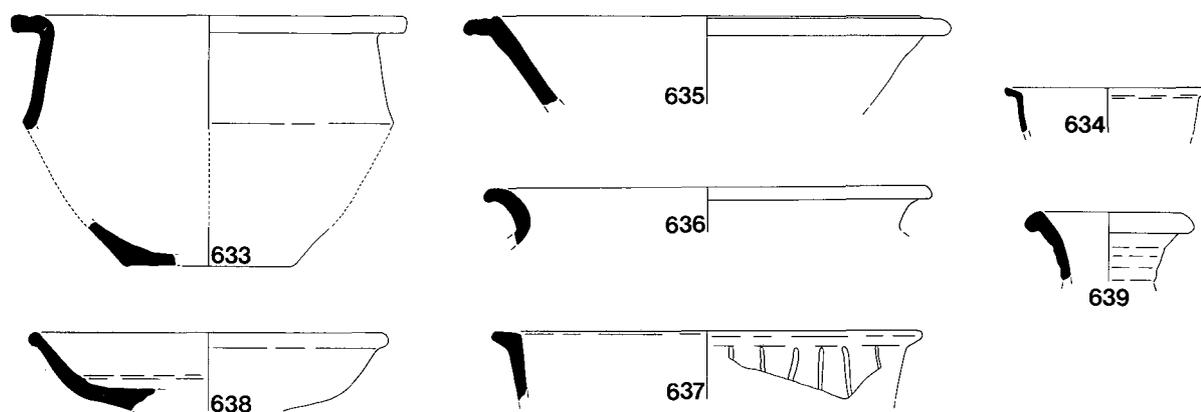


FIG. 137. Coarse pottery. Nos 633–639 (1:4).

630. 1993. Dish in light grey fabric with darker surface. The form is derived from a *terra nigra* dish (cf. Greene 1979, fig. 50 no. 4). Probably first century.
631. 2931. Lid in light grey Fabric *a*.
Context includes a fragment of No. 528.
632. 2933. Jar in Fabric *c* perhaps originally grey but now largely burnt pink.
633. 3253. Flanged bowl in brown to grey fabric.

Phase 17

Three vessels are represented in this phase, a BB1 bowl, a dark grey jar, and parts of a flanged bowl. The BB1 bowl was too fragmentary to be useful in dating and the other items are likely to be residual.

Phases 18, 19 (post-fort abandonment) and unphased contexts

The phases are post-fort and, as they include some medieval sherds, probably post-Roman. A small selection of vessels, mainly those of later Roman date or of intrinsic interest, are published.

634. 1880. Flanged bowl in thin micaceous dark grey fabric, burnt brown on the rim; from a very small bowl and a non-culinary use is possible.
635. 1905. Flanged and grooved bowl in BB1. There appear to be two grooves, but this may be an error on the part of the potter and a bowl such as Gillam (1976) no. 42 was probably intended. Probably late second to early third century, but see also Holbrook & Bidwell (1991), SWBB1 type 69.
636. 2939. Jar in BB1 (cf. Gillam 1976, nos 11–12). Late third to early fourth century.
637. 2940. Flanged bowl in light grey Fabric *c*; probably residual but the vertical decoration on the wall is unusual.
638. 001. Dish in light orange fabric with traces of an orange/red colour-coat. Probably a Caerleon product imitating Samian Form 18/31. First half of the second century, subsequently burnt in 1983.
639. 018. Flagon in off-white fabric from the Verulamium region (cf. Frere 1984, no. 1935). Mid-second century.

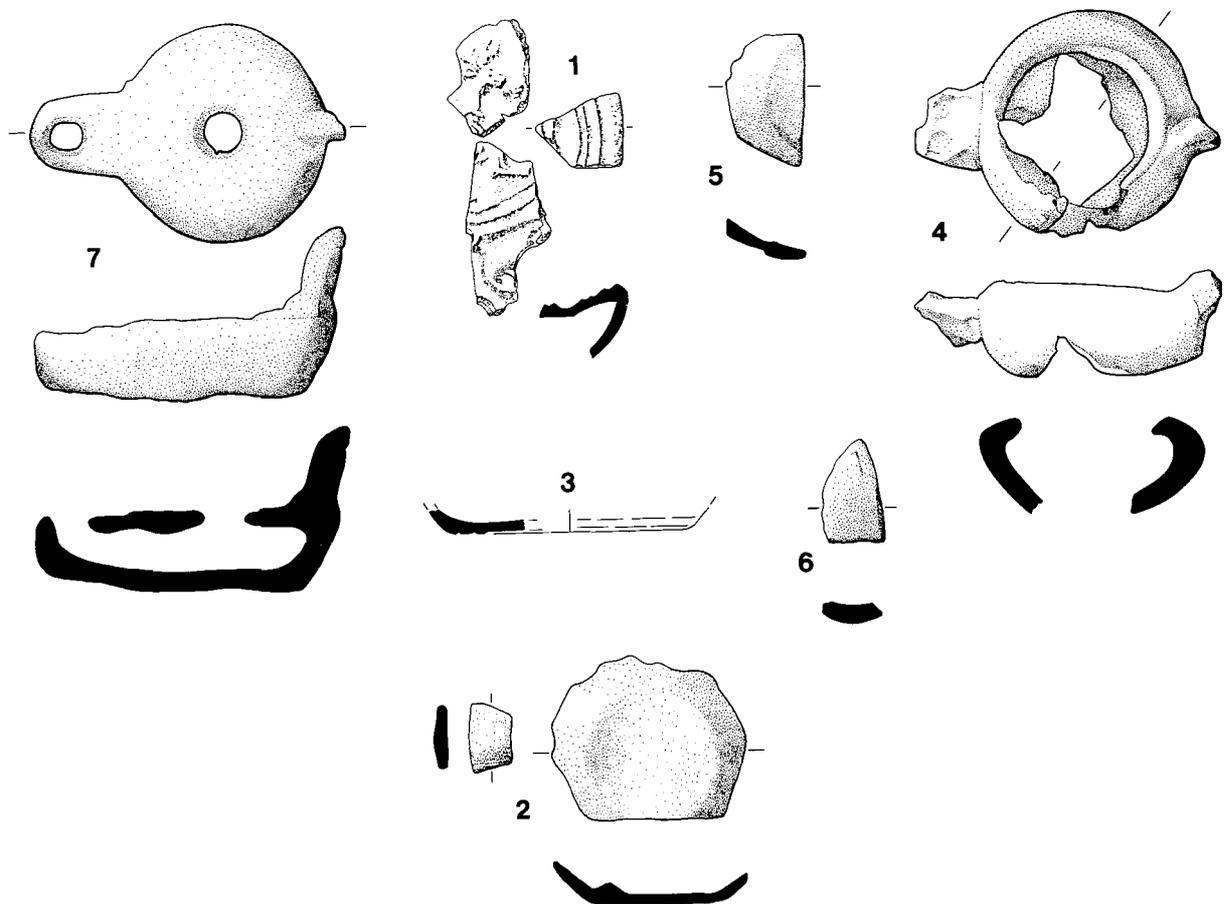


FIG. 138. Ceramic lamps. Nos 1-7 (1:2).

LAMPS (FIG. 138) By D. Bailey

Commentary

Eight lamps or fragments of lamps were recovered (all reported below); two other lamps or lampholders are noted in the report on lead objects (Nos 1 and 2).

Catalogue

1. 55/020 and 096 (056). One fragment and four fragments (two adjoining). All from the same lamp, of Loeschcke Type IV, with a figure-type of Diana seated, with a stag, as Goethert-Polaschek Motivkatalog M. 17 (with other references). Gaulish, Rhineland fabric. *c.* 40-100.
2. 55/064 (255). Base fragment and underbody fragment of a volute-lamp, Loeschcke Type I or IV. Gaulish, Rhineland fabric. *c.* 40-100.
3. 53/582. Base fragment of a North Italian *Firmalampe* of Loeschcke Type IX or X. *c.* 70-150.
4. 53/584. Several fragments of a wheel-made (or, if mould-made, the nozzle has been applied separately) lamp with the wick-hole pierced through the nozzle and body-wall. Unknown type and probably of local manufacture.¹¹
5. 53/1000 (661). Two adjoining fragments of base of volute-lamp, as No. 2 above.
6. 53/1730 (663). Underbody fragment of volute-lamp, as No. 2 above.
7. 53/2027 (550). Wheel-made lamp with applied nozzle and handle. Probably made in Britain. No parallels known.¹²
8. 53/2874 (826). One fragment, Loeschcke Type IB or perhaps Type IV. Gaulish, possibly Lyon. 50-100. (Not illustrated)

OBJECTS OF GLASS

GLASS (FIGS 139–140) By Denise Allen

Introduction

The assemblage comprises a total of 783 vessel glass fragments, 52 beads, 61 gaming-pieces or counters, and 39 fragments of window-glass.

The overwhelming majority of the vessel-glass is blue-green: 726 fragments in all, as opposed to 32 colourless fragments, 12 yellow-green fragments, six of dark blue glass, four of dark brown glass, and three of amber glass. The blue-green glass includes 115 burnt pieces, many of them quite large lumps which probably include a number of individual fragments, thus making the total potentially greater.

As on most Roman sites occupied during the first two centuries, the commonest vessel type is the blue-green bottle, made in a variety of shapes and sizes from about the middle of the first century as containers for transporting and storing liquid goods. An overall total of 275 fragments has been identified and listed under the separate sites in the archive, with only a summary here. It is interesting that on most of the Loughor sites bottles with cylindrical bodies, which went out of use during the early second century, appear to be more numerous. Only at Site 53 are these outnumbered by prismatic vessel fragments, most of them recognisably square. This latter shape continued to be made throughout the second century, and is therefore often the most common. The true significance of this as to date, changes in trading patterns, or preference for the liquids contained in the cylindrical bottles remains, however, obscure.

Other blue-green glass containers include two bath-flask fragments (Nos 12, 17), and various rim and neck fragments of flasks or unguent bottles, of which insufficient remains to identify them closely (Nos 10, 11, 16, 36, 37).

Items of tableware are more varied, but all represent vessel types which commonly occur on Roman sites throughout Britain. The only examples of first-century cast vessels are seven pillar-moulded bowl fragments (Nos 1–7), all of the blue-green variety which continued to be made until some time within the Flavian period, and sometimes survived into the early second century. Other well-known types are the long-necked jugs and globular jars which were extremely popular during the later first and second centuries, and which are well represented here (Nos, 8, 9, 13, 14, 19–21, 23, 24, 30–4).

Colourless tableware was popular from the Flavian period onwards, and is represented here by a variety, albeit extremely fragmentary, of beakers, bowls, and/or cups. There are possibly six examples (Nos 41–6) of the popular Flavian-Trajanic facet-cut beakers, already well-known on other South Welsh sites such as Caerleon. Of a further six beaker/bowl fragments, all decorated with horizontal wheel-cut or -incised lines, and one of them indented, none can be closely identified or dated.

Most of the beads are of the melon type (49 in all) which are predominantly first-century in date, becoming much less common during the second century.

The relatively high number of gaming-pieces or counters is quite unusual. Overall there are 28 white counters, 30 black, 2 dark blue, and 2 blue-green, providing sufficient for several full gaming sets or a great deal of accounting!

The window-glass is all of the cast matt-glossy variety in use to about 300 (Boon 1966).

Thus the assemblage consists largely of glass types commonly found in contexts of the later first and second centuries.

Catalogue

Blue-green vessel glass: cast

1. 69/056 (071). Diam. of rim *c.* 200 mm. Small rim fragment of a pillar-moulded bowl of blue-green glass. Cast; rim rotary-polished inside and out; top of one fine-polished rib extant. (Not illustrated)

2. 57/310. Diam. of rim *c.* 170 mm. Rim fragment of a pillar-moulded bowl of blue-green glass. Cast; rim rotary-polished inside and out; edge of one rib extant. (Not illustrated)
3. 57/142. Very small rim fragment of a pillar-moulded bowl of blue-green glass, as above. Rim diameter indeterminable. (Not illustrated)
4. 53/944. Rim fragment of a pillar-moulded bowl of blue-green glass. Cast; rim rotary-polished inside and out; part of one rib extant. Distorted by fire. (Not illustrated)
5. 53/3298. Body fragment of a pillar-moulded bowl of blue-green glass. Rotary-polished within, with two horizontal, wheel-incised bands extant. Fire-polished outer surface, with parts of two ribs surviving. (Not illustrated)
6. 53/3612. Fragment much distorted by fire, probably the rim of a pillar-moulded bowl of blue-green glass. Evidence of rotary-polishing marks inside, and around rim. Part of one rib extant. (Not illustrated)
7. 53/3712. Small fragment, possibly from the base of a pillar-moulded bowl of blue-green glass. Matt inner surface, with scant evidence of rotary-polishing circles; faint radiating ribs on outer surface. (Not illustrated)

Pillar-moulded bowl fragments, particularly those of blue-green glass, are amongst the commonest glass finds on first-century sites. They were made until some time in the Flavian period, but the sturdy form allowed use to continue for some years. Possible manufacturing methods have been discussed recently elsewhere (Price 1985, 304–5).

Blue-green and coloured vessel-glass: blown

8. 55/096 (103). Small fragment of a handle of dark blue glass. Handle apparently straight, with flattened cross-section – part of one edge only extant. (Not illustrated)
9. 55/179 (171). Diam. of body *c.* 120 mm. Two body fragments of clear yellow-green glass. Body apparently bulbous or globular, with vertical optic-blown ribs.
Fragments Nos 8 and 9 almost certainly represent a group of long-necked jugs and globular jars (see also Nos 13, 14, 19–21, 23, 24 and 30–34 below) which were extremely common in the North-Western provinces during the later first and earlier second centuries (Price 1978, 74). Strong monochrome colours, here dark blue, amber, and blue-green, are characteristic, as are flat-sectioned handles with one or more ribs, and spiral optic-blown ribbed bodies. Fragments of the latter could belong to either jugs or jars. The bodies of the jugs may be conical, with either a simple concave base or a folded base-ring, or globular, like the jars.
10. 55/121. Diam. *c.* 25 mm. Rim fragment of a bottle, flask, or unguent bottle of blue-green glass. Rim folded outward, upward, and inward.
11. 55/064 (066). Diam. of neck 20 by 23 mm. Neck fragment of blue-green glass; neck slightly oval in cross-section, now bent sharply over to one side of shoulder. This is almost certainly a subsequent distortion by fire, and original neck would have been vertical.
Neither of fragments Nos 10 or 11 is sufficiently diagnostic to allow close identification to be made.
12. 55/288 (202). Width of handle *c.* 11 mm. ‘Dolphin handle’ fragment of a bath-flask of blue-green glass part of neck and thick-walled, globular body still adhering.
These globular-bodied bath-flasks originally had metal handles attached to the glass ‘dolphin handles’, by which the vessel, full of oil, would have been carried to the bath-house. The type (see also No. 17 below) was long-lived, occurring from soon after the middle of the first century to the earlier third century. Many examples, including some highly decorated pieces, were found at the fortress baths at Caerleon (Allen 1986, 99ff., nos 3, 11, 26, 32–42, 52–6, 79, figs 41–2).
13. 69/253, 257, 264. Five body fragments, probably from a jug, of brown glass. Very little curvature on extant fragments, suggesting body shape was conical, with vertical optic-blown ribs. (Not illustrated)

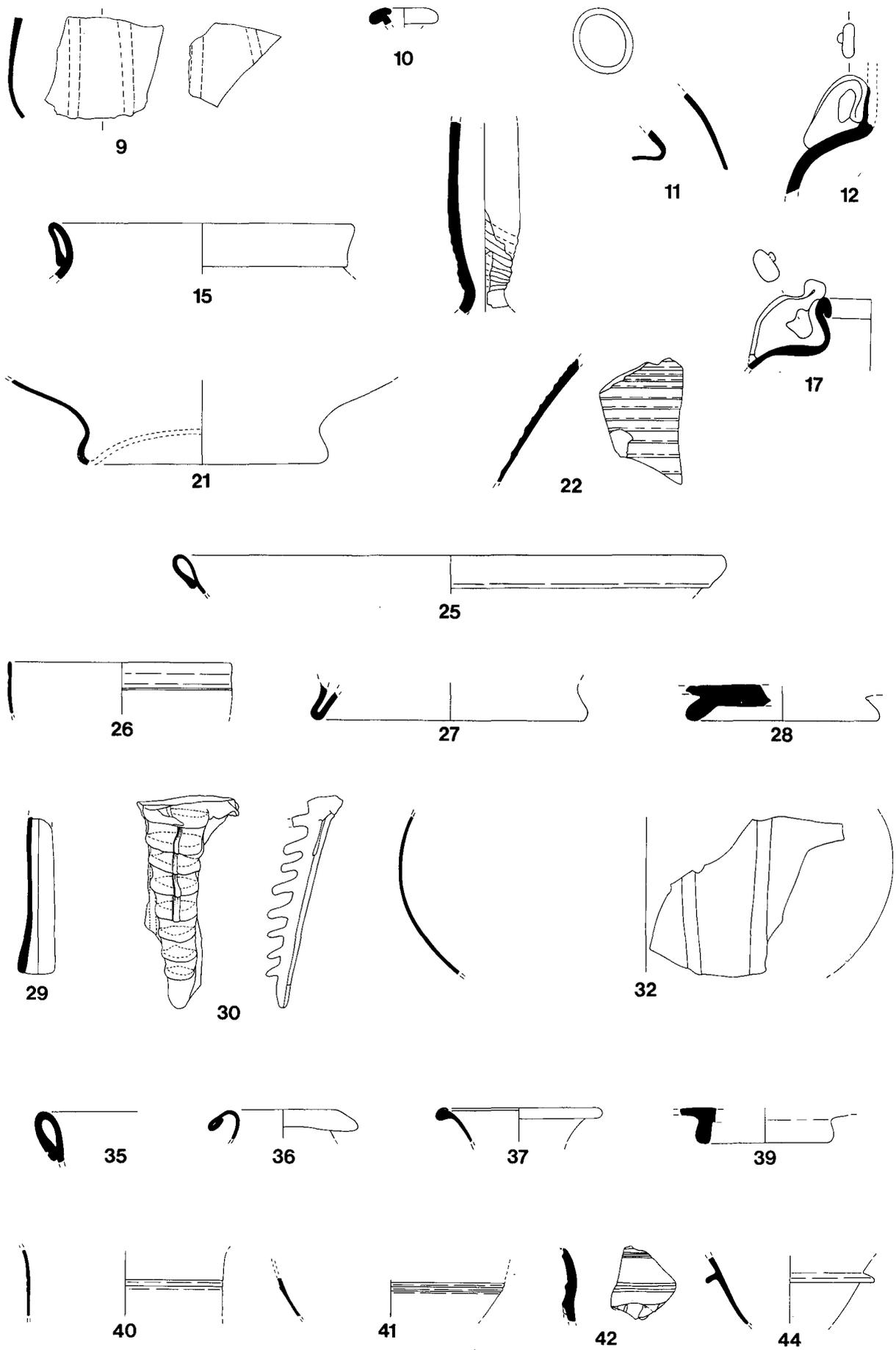


FIG. 139. Objects of glass. Nos 9–12, 15, 17, 21, 22, 25–30, 32, 35–37, 39–42, 44 (1:2).

14. 69/150. Body fragment of blue-green glass; curvature suggests that it comes from the upper body of a conical vessel, probably a jug; faint vertical optic-blown ribs. (Not illustrated)
15. 69/056 (097). Diam. of rim *c.* 110 mm. Rim fragment of a jar of blue-green glass. Rim fire-rounded and thickened, and folded outward and downward to form hollow tubular collar.
16. 69/056 (090). Diam. 140 mm. Neck fragment of a jug, bottle, flask, or unguent bottle of blue-green glass. Cylindrical neck. (Not illustrated)
This fragment is not sufficiently diagnostic to allow close identification to be made.
17. 69/235 (161). Rim diam. *c.* 40 mm; handle width 12 mm. Rim, neck, and handle fragment of a bath-flask of blue-green glass. Rim folded inward and downward; short, cylindrical neck; 'dolphin' handle; globular body.
18. 57/346 (242). Body fragment of clear, bubbly, dark blue glass, from a fairly large, straight-sided vessel, probably a conical jug; part of one vertical optic-blown rib extant. (Not illustrated)
19. 57/052 (058) and (042). Diam. of neck *c.* 25 mm. Four neck fragments of blue-green glass, almost certainly from a jug. Lower part of cylindrical neck extant, with spiralling optic-blown ribs.
20. 57/014 (031). Width of handle 30 mm. Handle fragment of amber glass: flat-sectioned with central raised rib. (Not illustrated)
21. 57/192. Diam. *c.* 90 mm. Base fragment, probably of a jar or globular jug, of blue-green glass. Pushed-in open base-ring.
22. 57/051 (053). Body fragment of yellow-green glass; curvature suggests that it comes from the upper part of a conical or ovoid body, probably a jug, with spiral optic-blown ribs.
23. 57/084. Body fragment of blue-green glass with spiral optic-blown ribs; probably from a jug. (Not illustrated)
24. 57/192. Body fragment, as above. (Not illustrated)
25. 57/142 (170). Diam. *c.* 200 mm. Rim fragment of a bowl of yellow-green glass. Rim folded outward and downward forming hollow tube.
Bowls with tubular rims occur throughout the Roman period. A variety with cylindrical body, often ribbed, was particularly popular during the later first and second centuries (Isings 1957, 59–60, Form 44). However, later Roman examples also occur, as at Portchester (Harden 1975, 369, fig. 197, 8).
26. 57/166. Diam. of rim *c.* 80 mm. Rim fragment of a beaker of pale blue-green glass. Vertical rim, ground smooth, with a broad horizontal, wheel-cut groove beneath, and another wheel-cut line below this.
27. 57/011 (028). Diam. *c.* 100 mm. Base fragment of a vessel of blue-green glass. Pushed-in tubular base-ring.
28. 57/526. Diam. *c.* 70 mm. Base fragment of a vessel of blue-green glass. Applied solid base-ring. None of fragments Nos 26–28 is sufficiently diagnostic to allow close identification.
29. 57/001 (002). Diam. of thickened end 13 mm. Fragment possibly from the end of a funnel, of streaky blue-green glass. Tubular, slightly curved 'neck' with end fire-rounded and thickened.
Glass funnels are not particularly common Roman finds, and most dated examples seem to belong to the first, and possibly early second centuries (Isings 1957, 92, Form 74). Certain British finds include one from Exeter (Charlesworth 1979, 229, no. 40, fig. 71), and one from a context dated before 130 at the Caerleon *vicus* (National Museum of Wales). Narrow tubular fragments, like No. 28 here, tentatively identified as funnels, have been found at Fingringhoe, near Colchester, and Verulamium.
30. 53/3369. Fragment from beneath the handle of a jug, of yellow-green glass. Pinched decorated tail of handle extant, with vessel shoulder fragment still adhering, showing vertical optic-blown rib. Angle of shoulder suggests that the jug was originally conical.
31. 53/3174. Small fragment of a handle tail, similar to No. 30 above, of blue-green glass, distorted by fire. (Not illustrated)

32. 53/2241 (588). Body diam. *c.* 180 mm. Two joining body fragments, probably from a jar or jug, of blue-green glass. Bulbous body, with vertical optic-blown ribs.
33. 53/344 (131). Diam. *c.* 25 mm. Fragment of cylindrical neck, probably of a jug, of yellow-green glass. Cylindrical neck, diameter *c.* 25 mm part of folded upper handle attachment still adhering. (Not illustrated)
34. 53/2070. Body fragment, probably of a jar or jug, of blue-green glass. Body apparently bulbous or rounded-conical, one vertical optic-blown rib extant. (Not illustrated)
35. 53/3148. Small rim fragment of a bowl of dark blue glass. Rim folded outward and downward, forming hollow tube. Bowls with tubular rims were most popular during the later first and early second centuries. The dark blue colour of No. 35 is in accord with this dating.
36. 53/310 (143). Rim diam. 55 mm. Rim fragment of a flask, jar or bottle of blue-green glass. Rim folded outward, downward, and inward, forming sloping lip.
37. 53/1000. Diam. *c.* 60 mm. Rim fragment of a flask, jug, or bottle of blue-green glass. Flaring rim, folded outward, upward, and inward.
38. 53/643. Diam. 13 mm. Fragment of cylindrical neck of blue-green glass. (Not illustrated)
39. 53/3119. Diam. *c.* 60 mm. Base fragment of a vessel of blue-green glass. Pushed in solid base-ring.

None of fragments Nos 36–39 is sufficiently diagnostic to allow close identification.

Bottles

A total of 275 fragments of common blue-green bottles was found at Loughor. Of these 106 could be identified as coming from cylindrical bottles, and 82 from prismatic bottles, of which 35 were certainly square (13 of the latter being from one bottle on Site 53), and two certainly hexagonal. Square bottles were the longest-lived variant, spanning the second half of the first and the second centuries. Cylinders and hexagons disappeared from use early in the second century.

TABLE 28: LOUGHOR: DISTRIBUTION OF BOTTLES ACROSS EXCAVATED SITES

Site	Total	Bottle Fragments			
		Cylindrical	Prismatic (Total)	Prismatic (Square)	Prismatic (Hexagonal)
55	75	26	17	3	2
69	40	17	9	3	—
66	5	3	2	1	—
57	74	45	12	4	—
53	81	15	42	24	—
Total	275	106	82	35	2

Colourless vessel-glass: blown

40. 55/036. Diam. of body *c.* 70 mm. Side fragment, probably of a beaker or cup, of colourless glass; now slightly milky and opaque. Apparently cylindrical body with part of two horizontal wheel-cut lines extant.
Not enough remains of this piece to closely identify or date it.
41. 69/223. Diam. of body at ridges *c.* 80 mm. Side fragment, probably from a beaker or cup, of colourless glass. Outer surface rotary-polished, with part of three horizontal, wheel-cut ridges extant, and a horizontal wheel-incised line beneath.

This fragment is not diagnostic enough to identify it with certainty, but it may belong to the group of facet-cut beakers discussed below with reference also to Nos 42–46. Facet-cut beakers of this type were very popular during the late first and early second

- centuries, particularly the Flavian and Trajanic periods. These vessels are particularly prone to crumbling into very small fragments through weathering, as has happened to No. 43. Characteristics and typology have been discussed by Oliver (1984), and the plain band between the lower rim ridge and the zone of decoration classify No. 41 as belonging to his Type II; the horizontal hollow-ground ridge round the lower body, as on No. 44, is also diagnostic of the type. There is some variation in the shapes of the facets, but diamonds are amongst the most commonly used. At least fifteen fragmentary beakers of this general group have been found at Caerleon (e.g. Nash-Williams 1929, 257 no. 2; 1932, 85–7, no. 53) and other South Welsh finds include a fragment from Cowbridge.
42. 54/028. Diam. of rim *c.* 90 mm. Rim fragment of a beaker of colourless glass; now whitish and opaque, with surfaces dulled. Rim ground smooth, with horizontal hollow-ground ridge beneath, then a ground band with another hollow-ground ridge, and beneath this a zone of facet-cut decoration, of which the rounded tops of two facets survive.
 43. 57/142. Nine small fragments of a beaker of thick colourless glass. Outer surface rotary-cut and ground; part of a ground band, and evidence of facet-cutting extant. (Not illustrated)
 44. 57/085 (150). Length of horizontal ridge 60 mm. Lower body fragment of a beaker of colourless glass, now milky and opaque. Outer surface rotary-ground: part of a horizontal ridge extant.
 45. 53/508 (199). Diam. of rim *c.* 90 mm. Two joining rim and side fragments of a beaker of colourless glass. Rim flared slightly and ground smooth, horizontal hollow-ground ridge beneath, and another further down side. Beneath this is a plain ground band, then a zone of facet-cut decoration: part of six interlocking rows of diamond-shaped facets survive, arranged in quincunx, the top now being rounded on their uppermost sides, with smaller, similarly rounded facets between them.
 46. 53/2960. Diam. *c.* 40 mm. Fragment, probably from near the base of a beaker, in colourless glass. Part of a hollow-ground band extant, bounded top and bottom by horizontal ridges.
 47. 53/584. Diam. of rim *c.* 80 mm. Rim fragment of a cup or beaker of colourless glass. Rim outflared slightly and ground smooth, with a horizontal ground ridge beneath. Also small body fragment, possibly from the same vessel, with part of a pair of horizontal ground ridges extant.
 48. 53/297 (066). Diam. of body *c.* 120 mm. Body fragment of a bowl of buff-colourless glass; now cloudy and opaque. Outer surface rotary-ground: horizontal band of three ground ridges extant at upper limit of fragment, and a pair of ground ridges further down the side.
 49. 53/1977 (545). Small body fragment of a vessel of colourless glass, now cloudy and opaque. Pair of horizontal ground ridges extant (possibly the same vessel as No. 47 or 48). (Not illustrated)
 50. 53/582 (205). Diam. of body *c.* 90 mm. Body fragment, probably of a beaker, of colourless glass; surfaces dulled. Rounded body, with two horizontal wheel-cut lines and one faint wheel-incised line extant around lower part.
- Colourless beakers and bowls decorated with horizontal cut lines and ridges were most common during the second and third centuries, when a wide variety of shapes was made.
51. 53/2356 (615), 53/2238, 53/2225 (594), 53/2123, 53/2231. Diam. of rim *c.* 90 mm. Eight rim and body fragments, some joining, of a beaker of greenish-colourless glass. Vertical rim, ground smooth, with horizontal wheel-cut line beneath, and faint wheel-incised line beneath that. Several oval indents extant around body, pushed in whilst the glass was still warm and pliable.

Indented beakers of both pottery and glass occur throughout much of the Roman period. The shape varies: some have base-rings, some have flat or slightly concave bases, some have flaring necks, and the number of indents ranges from four to twelve, or even sixteen. A colourless beaker with four indents and a base-ring, somewhat similar in profile to No. 51, came from a stone coffin of probable third-century date at York (Harden 1962, 140, pl. 66, no. HG180). However, an almost identical example found with a coin of Hadrian at Jenkins Field, Caerleon (National Museum of Wales) shows that the type was long-lived.

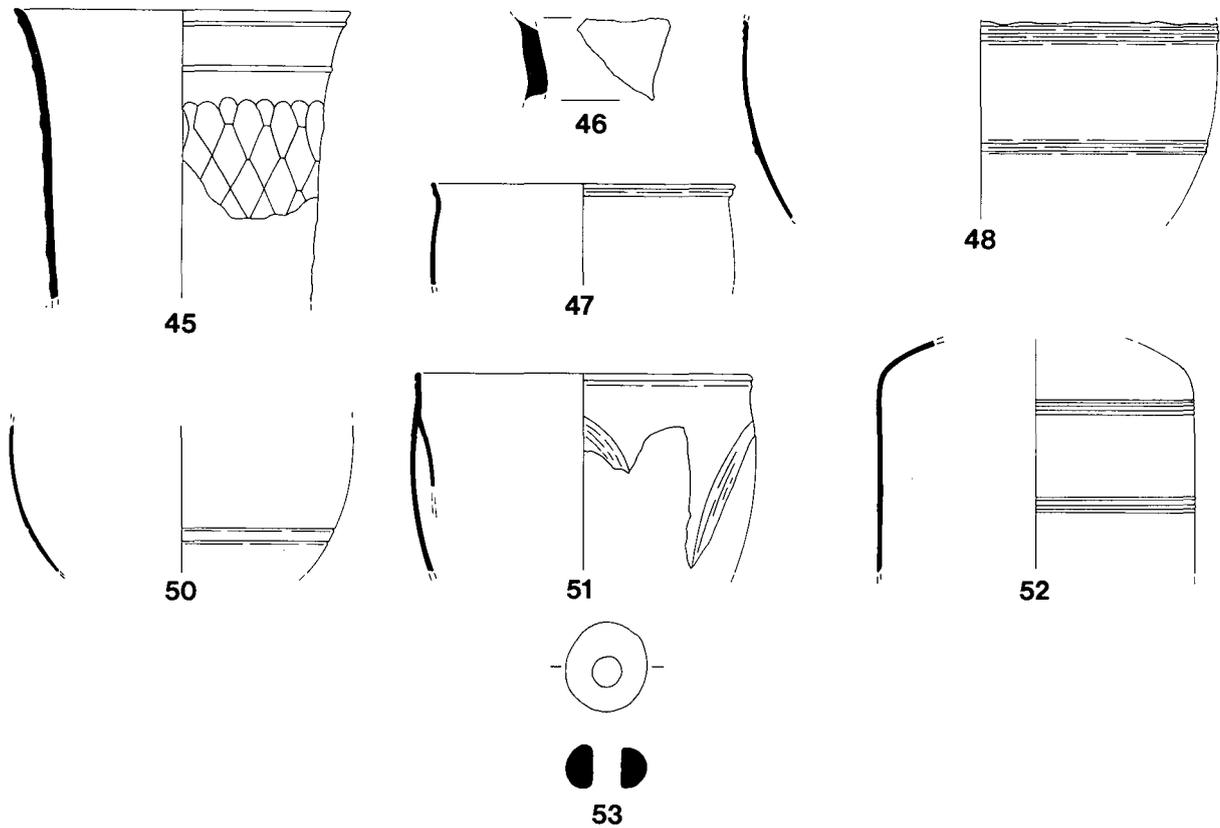


FIG. 140. Objects of glass. Nos 45-48, 50-53 (1:2).

52. 53/568 (169). Diam. of body *c.* 85 mm. Eight shoulder and body fragments of a bottle, flask, or jug of colourless glass; now whitish and opaque. Curved shoulder, and cylindrical body with two bands of four horizontal wheel-cut lines extant.

Cylindrical containers of colourless glass, often decorated with bands of horizontal cut lines, were the third- and fourth-century replacements of the common blue-green bottles of the earlier Roman period. They occurred in a variety of sizes, with and without handles, and body fragments cannot therefore be assigned with certainty to any one specific type (e.g. Isings 1957, Forms 100, 102, 126, and 127). This piece, however, is from a well-sealed context dating to 95-105.

Beads: glass and faience

The Loughor collection consists of forty nine melon beads, seven in dark blue glass and forty two in turquoise paste or faience, and three other beads, one of which is reported below. Melon-shaped beads, made of blue glass or powdered quartz with a turquoise glaze, are extremely common on first-century sites throughout the Empire. They become much rarer in second-century contexts.

53. 57/382 (253). Height 11 mm, diam. 22 mm. Annular bead of blue-green glass; surface pitted and streaky. This fairly large bead is probably of first-century date. A very similar example has been found recently at Prestatyn (Blockley 1989). There were two other beads from this site.

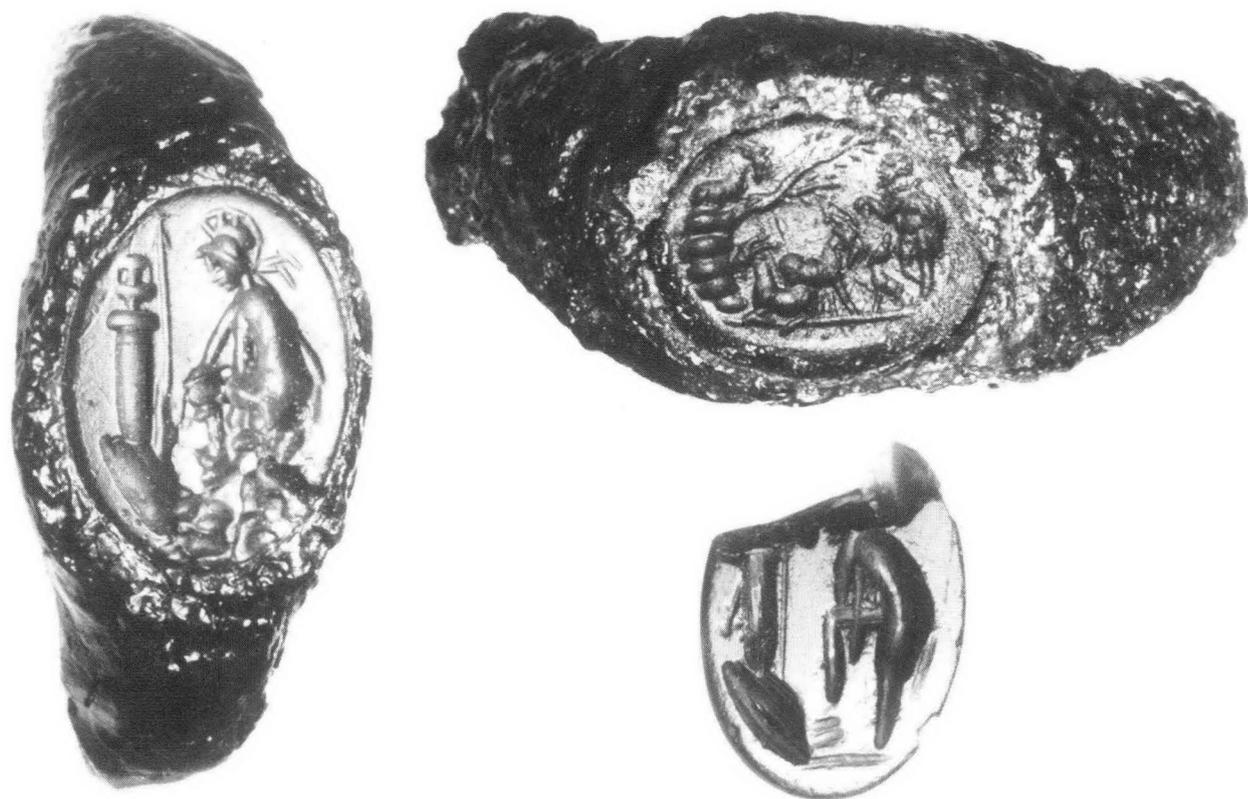


PLATE XXIII. Intaglios Nos 1-3 (courtesy R. Wilkins, Institute of Archaeology, Oxford)(4:1).

TABLE 29: LOUGHOR: DISTRIBUTION OF BEADS

Site	Total	Melon Beads		Other Beads
		Dark Blue Glass	Paste/Faience	
55	15	2	13	—
69	8	1	7	—
57	12	2	9	1
53	17	2	13	2
Total	52	7	42	3

Gaming-pieces or counters

The Loughor excavations produced sixty-two gaming pieces or counters (Site 55-13; Site 69-7; Site 57-8; Site 53-33). Glass gaming-pieces or counters are common finds on Roman sites at all periods, and cannot therefore be closely dated. Most numerous are those of opaque white and opaque black glass, but blue and blue-green examples also occur with four examples here, and occasionally they were decorated with blobs (e.g. two sets found at Lullingstone, Kent, *J. Rom. Stud.* 49 (1959), 132-3).

Window-glass

The Loughor excavations produced thirty-nine fragments of window-glass (Site 55-23; Site 69-9; Site 66-1; Site 57-4; Site 53-2); all of the thick, cast matt-glossy variety in use to *c.* 300 (Boon 1968). One fragment is colourless, the rest are blue-green, and the assemblage includes two fragments from Site 55 with the characteristic rounded 'thumb' finish from the edge of a cast pane.

INTAGLIOS (PL. XXIII) By Martin Henig

Catalogue

1. 53\2014 (549) Iron ring (incomplete hoop). A band of iron expanding towards the bezel. Diam. 25 mm, width across the bezel 11.5 mm, width at narrowest point 2.5 mm. The form seems to be intermediate between Types III and V (Henig 1978, 35–7, fig. 1) and is likely to date to the first half of the second century (PL. XXIII).

The intaglio, 12 mm by 9.5 mm, is cut in *heliotrope* (bloodstone), a green chalcedony streaked with red, and is oval with a flat upper face. The lower right of the face of the stone has suffered a fracture, perhaps the result of decay in the iron. It portrays a youthful male figure wearing a plumed helmet and evidently engaged in arming himself: he is putting on a greave. In front of him is a column upon which is an object approximately cruciform in shape but probably intended to represent an urn. A spear and a shield lean against the column. The subject is Achilles arming himself before the ashes of his dead friend Patroclus, and its iconography was taken from a sculpture by the fourth-century B.C. artist Lysippos or a member of his school. The type is not uncommon on gems and there is a good parallel in cornelian now in Lewes museum (Henig 1978, 244, no. 463 and references there, to which add Zwierlein-Diehl 1979, 171, nos 1290 and 1291, wrongly identified as Mars). The identity of the subject is emphasised by a green jasper intaglio of the same period from Melain (*Mediolanum*) in Gaul where the column is replaced by a standing female figure, Achilles' mother Thetis who provided her son with the wonderful armour made by Vulcan with which he avenged Patroclus by slaying Hector (Guirand 1988, 137, no. 439).

2. 57/014 (023). Cornelian intaglio of a pale amber colour. It contains two dark inclusions. The upper part of the stone is chipped. The upper face is flat and the sides bevel inwards (Form F1). The greatest surviving length of the gem is 10 mm, but it was originally 12 mm in length. It is 9 mm in width and 2.5 mm thick. (PL. XXIII).

The subject is the same as No. 1 above. There is a shield in front of Achilles leaning against the column. Note the shield in front of Achilles on a gem of related type from Richborough (Henig 1978, 245, no. 464).

The shape, translucency, and style of the cutting suggest a date no later than the first decade or two of the second century.

Comment on Nos 1 and 2

The occurrence of two specimens of the same iconographic type at Loughor is certainly striking but presumably co-incidental. However, Achilles was the exemplar to whom all young Roman soldiers must have aspired, and I long ago identified the type of youth standing in a relaxed pose holding weapons as Achilles and associated these with military taste in addition there is another type which I described as Alexander, but as Alexander saw himself as a new Achilles these too should be taken into account (Henig 1970, especially 252–6 and 264–5). Both types occur on gems found in Wales at Caerleon (see Henig 1978, 244, no. 460 and Zienkiewicz 1986, 136, no. 43 (Achilles); Henig 1978, 245, no. 469 and Zienkiewicz 1986, 135–6, no. 47 (Alexander)). Moreover the head of the Loughor Intaglio No. 1 brings to mind the splendid Alexander bust on a red jasper found by Wheeler in the Caerleon amphitheatre (Henig 1979).

3. 69\258 (189). Iron ring with complete hoop of rounded cross-section expanding towards the bezel. External diam. 27 mm; width across bezel 12 mm; width at narrowest point *c.* 6 mm (corrosion has presumably exaggerated these dimensions). The form is Type II (Henig 1978, 35–7, fig. 1), first or early second century (PL. XXIII).

Set in the bezel is an intaglio mould (i.e. from a cut gem) in a very dark glass. The result is one of the most charming vignettes of pastoral life to have come from Roman Britain, though of course it reflects the life of the Mediterranean countryside. The theme evokes tranquillity and fecundity. A herdsman clad in a shaggy coat leans on his staff, his faithful hound squatting beside him. A goat stands facing him and another sits with its

back to him. On a cliff in front of him another goat is seated. A tree sprouts from the cliff top providing welcome shade for the two goats, the hound, and the man below, and perhaps something of a meal for the animal above.

Comparison may be made with numerous Roman gems showing bucolic scenes, for instance two glass gems respectively in Berlin (Furtwangler 1896, 190, no. 4685) and in Leiden – formerly The Hague (Maaskant-Kleibrink 1978, 204, no. 458).

4. 57\052 (056). The intaglio 8.5 mm by 7 mm is moulded in emerald-green glass, with a very indistinct device which appears to be garbled, possibly a 'Romano-British' imitation of third-century date (cf. Henig 1978, 132–3, 255–8, nos 539–84). It is just possible that it is a more regular type and shows a clenched band or a foot (for a 'regular' glass intaglio which shows a foot cf. Schmidt 1970, no. 2167), although hands are normally represented clutching something, generally symbols of prosperity (Zwierlein-Diehl 1979, nos 937–8).

OBJECTS OF BONE AND STONE

SKELETAL REMAINS By J. L. Wilkinson

1. 53\3611. Total weight 152 gm. The remains consist of small fragments of cremated human bone, mostly 20 mm or less in size, grey in colour but not charred.
 Skull: one 30 mm fragment of right (frontal) orbital margin; 28 slender fragments of vault up to 38 mm long; one small piece of the tooth-bearing area of the maxilla with three empty sockets; one damaged fragment of tooth.
 Vertebrae: one small fragment of a vertebral body, three of vertebral arches.
 Ribs: six cortical fragments up to 22 mm long.
 Upper Limbs: humeri – 23 fragments of shaft up to 30 mm long and 42 mm thick, one small piece of upper articular surface and one of the lower articular surface; forearm bones – 23 shaft fragments up to 32 mm long, one piece of radial head, six pieces of metacarpal shafts.
 Lower Limbs: femora – 19 fragments of shaft up to 20 mm long and 7 mm cortical thickness; tibia – four small shaft fragments; one 13 mm piece of tibial plateau; a 37 mm piece of the lower end of tibia including part of the medial malleolus; four pieces of fibular shaft up to 35 mm long; feet – a fragment of the first metatarsal head.

Conclusions

These are very partial remains of a human cremation; some features such as the petrous temporal bones, which usually survive cremation well, are missing. There is no evidence of disease or injury.

Age: Mature adult.

Sex: Male (thickness of the humeral and femoral shafts).

FAUNAL REMAINS¹³ (FIGS 141–150) By P. Sadler

Introduction

Summary

A total of 7,602 bones and shells were recovered from the excavations; full details are to be found within the site archive. In terms of the individual excavation sites this breaks down as follows: Site 53 – 6,136; Site 54 – 6; Site 55 – 137; Site 57 – 1,215; Site 66 – 4; Site 69 – 104. As might be expected the greater part of the sample comes from the interior of the fort.

The 3,459 identified bird and mammal bones are listed in TABLES 30 and 31. The greater

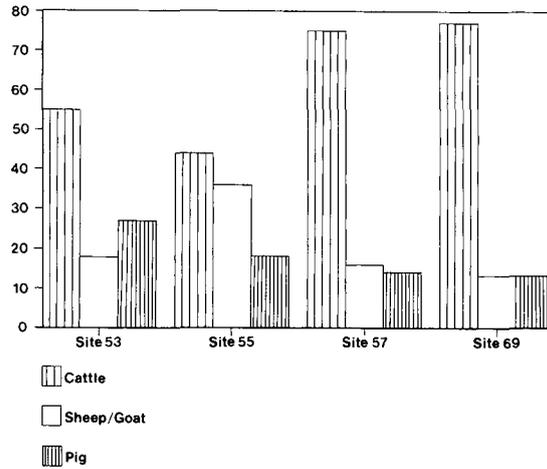


FIG. 141. Faunal remains: distribution of cattle\sheep\pig by site.

part of these are from the three main domestic species but others such as goat, horse, red and roe deer, hare, and even whale are represented. The high number of cattle remains are typical of a Roman military site and the whale and some of the birds are indicative of the site's estuarine location.

Methodology

Measurements were taken using dial calipers (Mitutoyo No 505–633, range 150 mm with dial graduations of 0.05 mm). Where these could not be used, measurements were taken to the nearest 0.5 mm. The points of measurement used are those described by von den Driesch (1976) unless otherwise stated.

All fragments have been counted unless they fit together, and on the rare occasions when a group of bones, such as carpals, are found together in one context and fit together, they are also counted as one. The unidentified bone contains all ribs and fragments of vertebrae too incomplete to identify with certainty and is divided into three groups; cattle-sized, sheep-sized, and small-sized.

Species present

The identified mammal bones are listed in TABLE 30, to which list must be added a mouse femur, a fox femur, and a fox lower tooth from Site 53, a pig lower tooth from Site 54, and a fragment of whale mandible from Site 57. The identified bird bones are listed in TABLE 31.

Five bones from Site 53 have been identified certainly as goat, but others may have been included in the sheep count. One rabbit bone was identified amongst each of the Site 53 (53\2211) and Site 55 (55\183) collections. The latter had chop marks on it and both may be intrusive.

Also identified from Site 53, but not included in the total for identified bone, are 37 oyster shells *Ostrea edulis*, one cockle shell *Cerastoderma edule*, one common whelk *Buccinum undatum* (57 mm long), one whale fragment (53\079) which showed signs of working, eleven fish bones (see below), and a small shell *Helix aspersa*. An oyster shell was also recovered from Site 69.

TABLE 30: FAUNAL REMAINS: RELATIVE ABUNDANCE OF THE DIFFERENT PARTS OF THE MAMMALS PRESENT

Site	Cattle				Sheep/Goat					Pig				Horse			Dog		Red deer		Roe deer		Hare			
	53	55	57	66	69	53	55	57	66	69	53	55	57	66	69	53	55	57	53	53	55	57	53	57	53	
Skull	67		21			14	1	2		1	43		8													
Horn core	7		16		1	3		2												15	1	1		5		
Maxilla	25		1			5					31		3							1						
Mandible	136		23		1	29	1	7			55		12						1	2				4	2	
Upper teeth	101	1	115	1	1	25	1	17			25		1						1							
Lower teeth	122	5	72		2	29	2	8			37	1	10			2			1	2					1	
Atlas	6		2			3		1			7		2													
Axis	12		4			2					3		1													
Cerv vert	4	1				3	1	1			1															
Thor vert	22	1	2		1	3					1															
Lumb vert	10		7			7		1			2								1	5						
Sacrum	5		2			1													1							1
Caud vert	9		1			1																				
Scapula	89	2	21	1	1	23	2	3			25	1	2		1					3				1	2	
Humerus	65		23			35	2	8			42	1	8	1					1	5				7	1	
Radius	75		20			43		3			23	1	1							2				9	2	
Ulna	37	1	6			10		2			30									1				6	2	
Pelvis	57		11		1	27		3			36		2			1				3				3	1	
Femur	82		15		2	26		4			51								2	5				3	4	
Patella	3		1		1	2																				
Tibia	68		17			54	1	10	1		41		10			1			1	1				8	4	
Fibula											18	1														
Astragalus	25		9			5					12									1					2	
Calcaneus	27		10			11					17		1							2						
Carp/Tars	51		6		1	1					3									2						
Metacarpal	42	1	15			30		8			65		1							2					3	
Metatarsal	64	1	15		1	34	1	5			23	1		1				1	2	3				7	1	2
Metapodial	21	1	7			2					15		7													
Sesamoid	3																									
Phalanx 1	45		14			17					26		2			2				2					3	
Phalanx 2	40	1	7			1					7	1	2							1						
Phalanx 3	17		4								4	1	1			1										
Total	1337	15	467	2	13	446	12	85	1	2	643	7	75	1	2	7	1	1	10	58	1	1	62	1	21	

TABLE 31: FAUNAL REMAINS: RELATIVE ABUNDANCE OF DIFFERENT PARTS OF THE BIRD PRESENT

Site	Fowl	Goose	Woodcock	Duck	Pigeon	Crow
	53	53	53	57	53	53
Thor Vert.	1					
Sternum	2					
Furcula	3	1			1	
Coracoid	11	1			2	
Scapula	3					
Humerus	23	3	5		1	1
Radius	13	1	2			
Ulna	17	1	2			
Carpom/c	5	2	1		1	
Pelvis	4					
Femur	17					
Tibiotarsus	40		6			
Tarsom/t	7		4	1		
Total	146	9	20	1	3	2

Relative frequency of the main domestic species

The relative proportion of cattle/sheep/pig on four of the sites (54 and 66 are excluded) is shown on FIG. 141.¹⁴ It should, however, be noted that the results may be affected by the variation in sample size from the different sites.¹⁵ There are, however, broad similarities between Sites 57 and 69, but higher proportions of pig bones were noted from Site 53 and sheep from Site 55. In addition to variabilities in the sample qualities, these differences may reflect either the presence of spatial and temporal factors in the bone deposition patterns or post-depositional attrition affecting the survival of certain of the faunal remains.

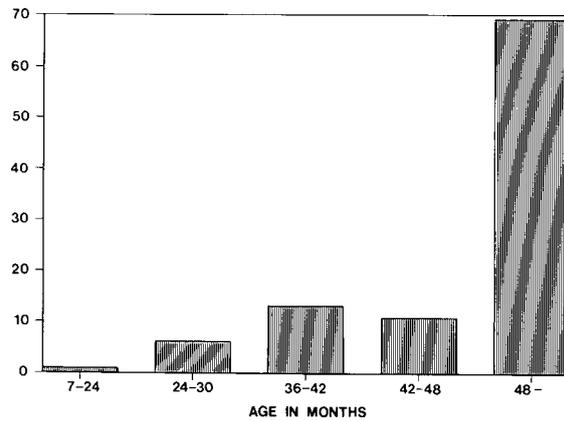


FIG. 142. Faunal remains: cattle age at death.

In the later phases of the occupation of Site 53, an increase in the percentage of pig bones recovered is apparent. This may reflect the higher status occupation of this part of the fort, as perhaps paralleled at Carleon, where similar proportions were found from one of the houses in the *latera tribunii* (Hamilton-Dyer, forthcoming). There is also in the later phases of Site 53 an increase in the ratio of wild to domestic food animals and birds.

Bone condition

The condition of the bone varied widely between the burnt and crushed bone from areas such as roadways to fairly complete specimens from rubbish infill deposits.

Butchery marks are commonly found on the cattle bones and the cattle-sized fragments rather than on the smaller bones. On Site 53 these marks are found on 5.9 per cent of the identified sheep bones and 17.2 per cent of identified cattle bones.

Few bones show signs of gnawing. This may reflect the absence of dogs or the effective disposal of the bones.

The burnt bone appears to derive from widespread burnt deposits such as that sealing Building 3.10 on Site 53 or from ovens or oven rakings. A sheep-sized fragment (53\2271), which has been burnt white, has several drops of glass slag attached.

The incidence of pathology is very low (0.8%–1.8%) considering that the figures also include abnormalities such as the absence of the lower second premolar and the lack of a third cusp on the lower third molar. The pathological cattle-sized fragments include four ribs which have been broken but have not mended resulting in extra bone growth around the broken end. In one case infection seems to have set in as there is a groove and a foramen in the new bone growth to

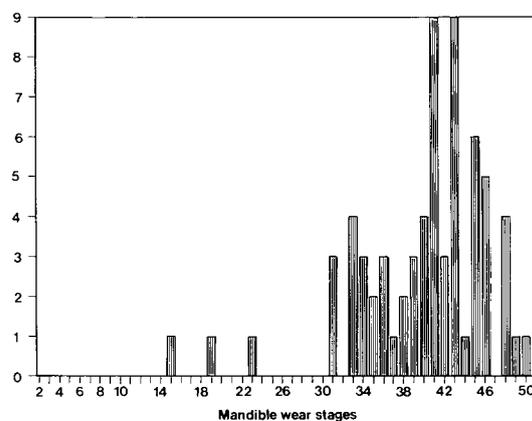


FIG. 143. Faunal remains: cattle mandible wear.

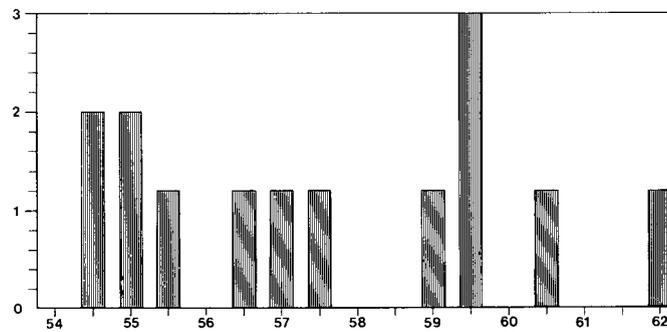


FIG. 144. Faunal remains: cattle length of astragali.

allow pus to drain away. The spine of a vertebra has been broken off and the same attempt to mend has again resulted in extra bone growth at the site of the break. Another vertebra, possibly the first thoracic, has both epiphyses fused although the fusion line is just visible, but these epiphyses seem too large for the body which is porous, especially on the ventral surface. The four pathological sheep-size fragments are all ribs, three of which appear to have broken then mended, one in an overlapping position, and the fourth one which seems to have two greenstick fractures in the process of healing. The sheep-sized fragment from Site 57 is a vertebral spine with asymmetrical articular processes and 'bulges' on the spine. The pathological identified bone is discussed later (below *passim*).

Cattle

Age distribution

Two methods are used to estimate the age at death of the cattle. The results of the first, using the state of fusion of the long bones, are shown in FIG. 142. The bones are divided into five groups according to the ages at which they fuse. These ages are based on modern breeds and are intended as a guide only. The age distribution generally shows that the majority of these animals had lived useful working lives before being killed for their meat.

The dental data (see FIG. 143) is based on the wear stages of the three lower molars, analysed using the method of Grant (1982, 92). Where only two of the three molars are present, the wear stage of the third has been estimated using Grant's table 2 (1982, 98-9). The pattern of aging is similar to that shown by the fusion data, with 69 per cent of the mandibles derived from animals three-and-a-half to four years or older; though very few from aged animals. Cows were often used for traction and would have produced one or two calves before slaughter.

Sex

Sex in cattle is normally determined by differences in the metacarpal bone. Utilising the method of plotting employed by Higham (1969) – maximum distal epiphysical width against the width of the distal fusion point – the fourteen specimens from Loughor fall into three groups with two, possibly three, bulls, seven castrates, and eight cows.

Five horn cores were measured and four fall into the range for cows and/or oxen and one is in the group which are possibly bulls (cf. O'Connor 1986, 236, fig. 83).

Size

One metacarpal, four radii, and five metatarsals were measured.¹⁶ The animals ranged in size from 993 mm to 1117 mm with a mean of 1053 mm.

Comparison of the Loughor specimens, in terms of the maximum length of the astragali (see FIG. 144), with examples from other sites suggests that these animals are similar to those from

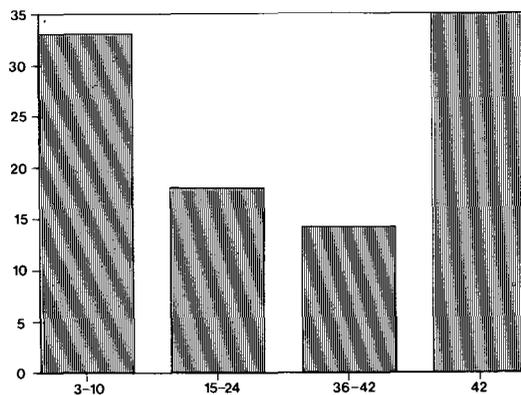


FIG. 145. Faunal remains: sheep and goat age at death.

Caerleon (O'Connor 1986) and Exeter (Maltby 1979, 36 & 168), which are rather smaller than those from eastern and central England.

Butchery

The skull and mandibles were chopped roughly and no clear pattern emerged from the thirty butchery marks except the removal of horn cores and cheek meat.

The most common of the sixteen marks on vertebrae were caused by chopping the vertebral column transversely; a single example had been chopped in a cranio-caudal direction.

The most frequent of the thirty five butchery marks on scapulae were due to the removal of the spine and coronoid process. Five blades had been whole when buried, but only two were sufficiently complete to show clearly the perforation of the blade and parallel cut marks which were probably the result of the joint being hung up and smoked before the meat was sliced from the bone, as has been previously evidenced from, amongst others, Tanner Row, York (O'Connor 1988, 82-3). Nearly all the humerus fragments are from the distal end and the main evidence for butchery practices is for the removal of the medial and lateral ends of the trochlea (10 out of 24 marks), presumably whilst stripping away the muscle attached at these points.

The twenty-one marks on the pelves were mostly across the acetabulum (disjointing from the femur) or on the pubis and ilium and the most frequently recovered evidence of butchery on the hind limb is related to the above, being the chopped-through femoral capita (9 examples from a total of 34 marks), closely followed by the removal of the medial part of the femoral distal epiphysis (6 examples).

Most marks on the tibia are on the shaft and are the result of the removal of the less meaty lower limb.

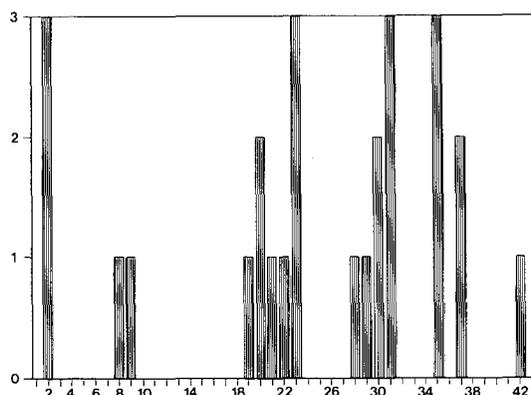


FIG. 146. Faunal remains: sheep and goat mandible wear.

*Pathological and skeletal abnormalities*¹⁷

One skull had two adjacent holes through the frontal eminence with the larger, 5.6 by 2.8 mm, on the parietal suture (cf. Baker & Brothwell 1980, 37). Other abnormalities were noted in the molars (Baker & Brothwell 1980, 150). Two mandibles have double mental foramina and another has a pit in the articular surface of the condyle. The lower second premolar is absent from six mandibles and the lower third molar is biscupid or has only a residual third cusp in 12 of 63 teeth, a slightly higher overall percentage than in comparable material from Exeter (Maltby 1979, 40), but much higher in two phases on Site 53 (Phase 8: 44 per cent, Phase 11: 50 per cent).

Calculus, when present, is heavy, but only two cases of periodontal disease have been recorded and the incidence of intra-dental attrition is low.

The pubic area of an acetabulum on a cattle pelvis shows eburnation and pitting, which may be the result of stress from heavy work such as traction. This may also be the cause of wear on three femoral capita and two first phalanges.

The distal end of a tibia is enlarged and the articular surface is covered with smooth new bone; the accompanying astragalus appears to have 'collapsed' slightly. A metatarsal has a small haematoma proximally and a congenital abnormality, a Type 1 depression in the distal articular surface (cf. Baker & Brothwell 1980, 110, fig. 3) was noted in the first phalanx.

Sheep and Goat*Age distribution*

The epiphysial fusion of the long bones and the eruption and wear of the teeth in mandibles were used to try to estimate the ages at which these animals were killed (see TABLE 32 and FIGS 145 & 146).¹⁸ The dental ageing shows that the majority (58 per cent) of the animals were killed or died between *c.* eighteen months and three years, but this is contradicted by the fusion evidence which shows that only a third had died at the same age and a third before they were one-year-old, whereas the dental evidence suggests that only 19 per cent were dead before reaching their second year.

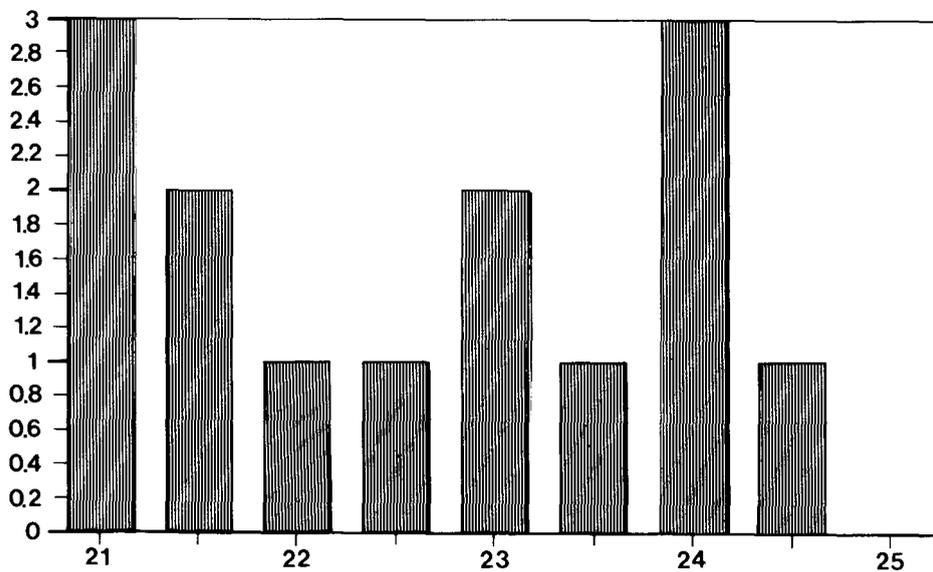


FIG. 147. Faunal remains: sheep and goat tibia distal widths.

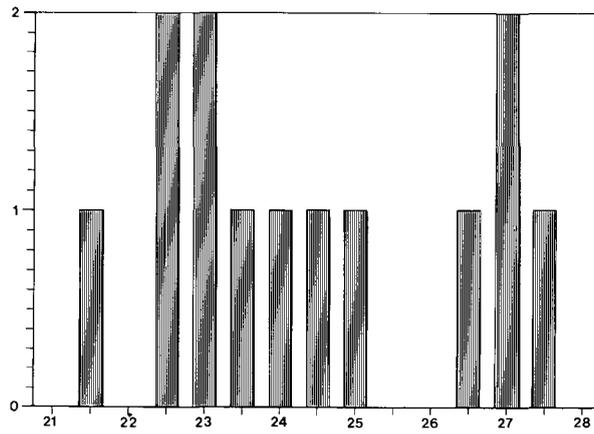


FIG. 148. Faunal remains: sheep and goat humerus length.

TABLE 32: SHEEP AND GOAT EPIPHYSIAL FUSION DATA

Age (mths)	Bone	UF	F	% killed before	% killed after	% killed between
3-10	3-10 Humerus	D	5			
	3-10 Radius	P	4			
	6-8 Scapula	D	5			
	total		14	29	33	67
15-24	15-20 Tibia	D	10			
	20-24 M/podia	D	13			
	total		23	22	51	49
36-42	36 Calcaneus	P	4			
	36-42 Ulna	P	4			
	36-42 Femur	P	2			
	42 Humerus	P	3			
	42 Radius	D	11			
	42 Femur	P	3			
	42 Tibia	P	4			
total		31	17	65	35	14

Killed or died	Before	3-10 m	33%
	Between	3-10 m and 15-24 m	18%
		15-24 m and 36-42 m	14%
	After	36-42 m	35%

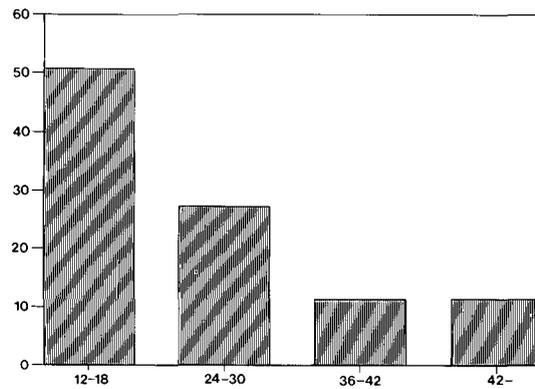


FIG. 149. Faunal remains: Pig age at death.

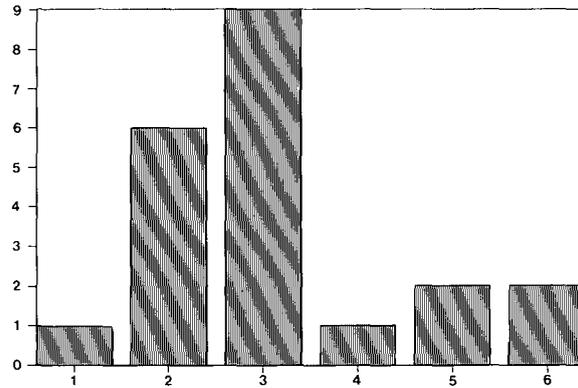


FIG. 150. Faunal remains: pig mandible wear.

As the dental evidence is usually the more accurate, the reasons for the lack of fused bones in the central groups have to be considered. There is no evidence to suggest removal of the bones, for example for working. It is possible, however, that the skeletons of these 'early' animals did not mature as quickly as their modern descendants. It may be that after any surplus lambs (possibly the weakest) had been killed the remaining males may have been castrated to provide better wool before they reached the age for slaughter for meat, leaving the females to be added to the breeding stock. Castration, and also poor nutrition, delay fusion and may have been, therefore, partly responsible for these results.

The mandible wear stages, if ageing estimates are correct, indicate an emphasis on the dispatch of sheep in their second or third year. It would not have been economically viable to kill the very young lambs and kids just to supply meat, but they may have provided a treat and their dispatch would have resulted in the availability of their mothers milk for cheese-making.¹⁹ Young sheep and goat skins could also be used for the production of a kind of 'astrakhan fur' (Lauwerier 1988, 132) or for the production of vellum parchment (Read 1972, 126–34).

Sex

There were too few measurable bones to make metrical differentiation between the sexes possible; one horn core however is possibly from a ram.

Size

Although often post- or pre-depositional damage to bones affects interpretation, at Loughor it is likely that the differences between the size of the sheep and goats were so marked that the problem is at least partly negated. Only three goat bones are complete enough to be definitely identified and measured. All three are larger than those which can be definitely identified as sheep. If this is true for all the goat bones then the two sheep/goat bones with similar measurements to the goat in FIG. 148 are highly likely also to be goat.

The maximum distal widths of the tibia (FIG. 147) range from 21.1 mm to 24.6 mm with a mean of 22.8 mm. These figures are as small as the majority of Iron Age samples and are at the lower end of the scale for Roman sites where the means of samples fall between 22.8 and 22.5 mm (Coy & Maltby 1987, 224).

The withers heights have been estimated from a radius, four metacarpals, and a metatarsal.²⁰ These give a range of 569.7–615.6 mm with a mean of 598.5 mm. The Loughor sheep generally seem to have been long-legged with fine bones.

Butchery

The only evidence of butchery comes from the later phases of Site 53, where three vertebrae and a goat sacrum had been chopped in half in a cranio-caudal direction. It is unusual to find this method of dividing the carcass at such an early date (cf. Maltby 1989, 88).

Many of the sheep-sized ribs had been either well chewed and/or bore a series of parallel light cut marks where the meat had been sliced off (cf. O'Connor 1986, 228).

Pathology

Pathological indicators were found on three radii, a metacarpal, and a metatarsal.

Pig

Age distribution

The pig mandibles were divided into six groups according to eruption and wear stages (Bourdillon & Coy 1980, 86). Using the information in Bull and Payne (1982, 56) an age estimate can be given to these stages as follows 0–6 months, 6–12 months, 12–24 months, 24–36 months, and Groups 5 and 6 are over 36 months (see FIG. 150).

The epiphysial fusion data (FIG. 149) is in accord with the dental data. The fusion data shows that 78 per cent of the pigs had been killed by the age of 2.5 years. As is invariably the case with pig, these animals had been used to supply meat.

Sex

Sexual dimorphism is so clear in the canine teeth that it is possible to separate the males/castrates from the females. The results are, however, biased if the teeth are loose as the larger male canine is not only more frequently recovered but is easier to identify from a fragment. At Loughor the numbers are eleven male and ten female, but the majority are from loose teeth.

Size

None of the measurements taken are large enough to be of wild boar. The withers height was estimated from eight bones but as these were all small bones (astragali and calcanei) a certain measure of inaccuracy has to be taken into account. The range was 644–714.2 mm with a mean of 655.5 mm.

Butchery

Two notable butchery methods were observed. The first is represented by vertical chop marks on the lingual surface of the mandible, sometimes to divide the jaws at the symphysis, the second is the division of the carcass along the middle vertebral arch; as with the despatch of the sheep and cattle this is an uncommonly early date for such a practice.

Pathology and skeletal abnormalities

A lower female canine has a 'kink' in the enamel; enamel hypoplasia may be the effect of vitamin D deficiency or systematic disturbance resulting from infection (Baker & Brothwell 1980, 145). A proximal radius has a haematoma on the medial aspect and an unfused distal femur shaft is filled with medullary bone, possibly the consequence of osteomyelitis.

Other domestic mammals

Horse

Nine horse bones were recovered, from a minimum of seven animals. The root development of two lower third molars suggests animals at least five years of age, but definitely not old. The fusion data (cf. Amorosi 1989, 39–50) indicates one animal less than 3.5 years old and two others more than 1.5 and 2 years respectively, which means that they may be completely mature, but there was no evidence for degenerative diseases. No butchery marks were evident and these few bones suggest animals only slightly larger than Exmoor ponies.

Dog

None of the dog bones are from large animals and three are small. Of these, a metatarsal (from Site 53 Phase 3) is very small, with a greatest length of only 43.3 mm and is most probably a pet. The only immature bone is an unfused distal femur (from an animal less than 18 months old).

Wild Mammals*Red Deer*

58 red deer, *cervus elaphus*, bones were found in nine phases on Site 53 and come from all parts of the skeleton suggesting that whole animals were brought to the site. The deer are similar in size to those recovered from other Roman sites and from medieval Faccombe (Sadler 1990, 491–3) with the exception of some lower limb bones and lower third molars which are larger.

Only one example, an unfused distal humerus, showed signs of immaturity; a lower third molar and a mandible both come from elderly animals with age estimates of about 17 years and 12–15 years (cf. de Nahlik 1974, 57, fig. 10; Lowe 1969, pl. 4).

Ten bones have butchery marks. Two femora are pathological; one, a distal fragment, has exostoses, whilst a proximal fragment, the caput, has a highly polished area.

Roe Deer

As with red deer, roe deer, *Capreolus capreolus*, bones were recovered from twelve of the phases on Site 53. Again all parts of the skeleton are represented.

The roe deer were also similar in size to the medieval examples from Faccombe (Sadler 1990, 495–6), although the phalanges and lower molars were again larger.

The age of the animals varied in range from 6–10 months to 6 years (Aitken 1975, 132).

Seven bones showed evidence of butchery; these were mainly light cut marks indicating careful butchering of the carcass with a knife rather than chopping with a cleaver.

Fox

Fox, *Vulpes vulpes*, is represented by two bones.

Hare

21 hare, *Lepus sp.*, bones were recovered. Evidence of consumption is represented by light cut marks on the edge of a scapula.

Whale

The most uncommon find in the Loughor collection was a fragment of a whale mandible found on Site 57, which closely matches the jaw bone of a Humpbacked Whale, *Megaptera novaeangliae* (Bor), in the Oxford Museum collection, but the piece is too small to be precise. The fragment measures 250 by 120 by 20 mm thick and is curved longitudinally so that the internal mid-point is 233 mm higher than the edges when it is rested on a flat surface. Wedges had been used to separate this piece from the whole bone and it also has saw or chop marks along one edge. Only one record of the stranding of a humpback whale in British Waters could be found; noted between 1887 and 1889 and referred to as the 'Tay whale'. That whale could have been washed up here is confirmed by four strandings of the Lesser Rorqual near Loughor between 1913 and 1947. Another fragment of whale sp. from Site 53 may be unconnected.

The Birds*Domestic fowl*

The most common bird remains (80.2 per cent) belonged to domestic fowl. Some of the birds are pullets, near adult-size but immature; the majority are, however, mature specimens. The

size of the birds ranged from bantam to an individual with a femur which has a greatest length measurement of 81.9 mm, in the upper range for Roman examples.

Four bones showed signs of pathology; one indicated old age and another tuberculous osteomyelitis (Baker & Brothwell 1980, 77).

Geese

All the geese bones are smaller than medieval examples of domestic goose from Faccombe (Sadler 1990) but could not be identified to species. They may have come from White-fronted geese, *Anser albifrons*.

Duck

The three duck bones recovered are all of the size of Mallard, *Anas platyrhynchos*.

Pigeon

One of the pigeon bones is the size of Wood Pigeon, *Columba palumbus*, but the humerus fragment is the size of Stock Dove, *Columba oenas*.

Other Birds

Apart from the domestic fowl the greatest number (11.5 per cent) of bones came from Woodcock, *Scolopax rusticola*. Although often found on Roman sites, this is quite a high percentage. Also present was a single crow, *Corvus sp.*, bone.

Fish

All the fish bones came from Site 53 and are identified as follows:

Context	Species	Anatomy
127	Gadidae, probably Cod <i>Gadus morhua</i>	Precaudal vertebra centrum.
492	Herring, <i>Clupea harengus</i> or perhaps Twaite Shad <i>Alosa fallax</i>	Preoperculum fragment.
594	Flatfish, probably Plaice <i>Pleuronectes platessa</i> .	Anal pterygiophore.
607	Mullet, probably Grey <i>Chelon labrosus</i>	Left anterior half cleithrum.
787	Uncertain	Branchiostegal ray.
2014	Flatfish probably Plaice <i>Pleuronectes platessa</i> .	Anal pterygiophore.
2933	Bass <i>Dicentrarchus labrax</i>	Mid-half of parasphenoid.

Four unidentified fragments include pieces which may be Mullet opercular.

Plaice, mullet, and bass are all estuarine species and are most common in the coastal waters to the south and west of Britain and today are common catches, but usually only in the summer months.

Discussion

Most of the data presented here derived from the material recovered from Site 53, but the evidence from the other sites, apart from the frequency of the main domestic animals (see above), is similar to that from Site 53. Most of the meat consumed would have been beef. It appears that cattle would have been brought to the site when they had been used for ploughing etc., had reproduced, but were not too old. They were killed, skinned and butchered on site. Although

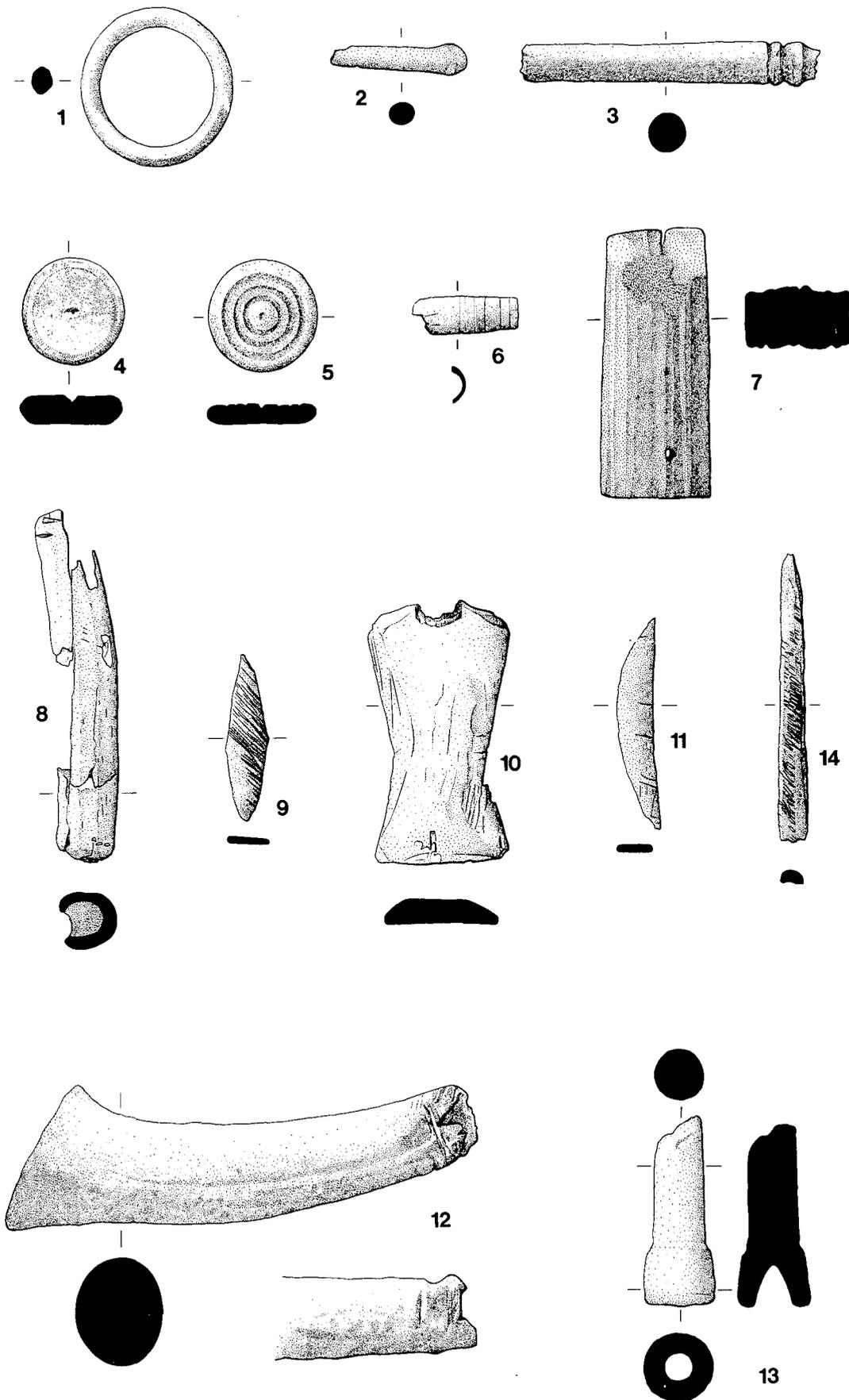


FIG. 151. Objects of worked bone and antler. Nos 1-5 (1:1), 6 (1:2), 7 (1:1), 8-12 (1:2), 13 (1:1), 14 (1:2).

the standard methods of cooking beef would have been roasting and boiling, at least some of the shoulder joints appear to have been smoked.

The presence of foetal lamb and very young goat on the site suggests that these animals were possibly kept within the vicinity of the fortress. Unlike pig they could have been kept fairly easily within bounds. The main reason for keeping sheep seems to have been for their meat and cheese, with wool only as a by-product.

Bones from pig the size of suckling animals were recovered, but no foetal material which may mean either that the animals were brought to site or that this fragile material has not survived. As foetal sheep and young goat persisted, the former seems more likely. Much of the pork eaten by the Roman soldier was in the form of bacon (Davies, R. W., 1971, 124) which would have left no evidence on the site.

The identification of the geese as *probably* White-fronted suggests fowling was a sport, as fishing may have been. On an unsieved site the fish will certainly be under-represented and some familiar species, such as eel, may have been missed. Most of the fish bones, but not the geese, were recovered from the later phases of Site 53 and add to the other evidence that suggests that this area was occupied by higher status individuals with a more varied diet.

OBJECTS OF BONE AND ANTLER By S. J. Greep

Introduction

Although the assemblage of bone and antler objects from Loughor is quite small, comprising only thirty two items of which at least half are waste products and three are of post-Roman date, it is of interest on several counts. The quantities of waste material, although not particularly large, add to the growing body of evidence for the working of both materials in military contexts throughout the Roman period in Britain. At Loughor, this material was recovered from Site 53, but cannot, as a group, be attributed to any particular phase of activity. It is unfortunate that the waste is not characteristic enough to identify the forms which were being produced, nor is there direct evidence for the tools which were being used. Of the remaining objects the small number of hairpins is typical of military sites, although the rarity of gaming-counters compared to the number of other finds is unusual.

Catalogue

Objects of personal adornment or dress

Ring

1. 57\088 (101). Diam. 25 mm. Bone ring with an oval section. Probably a finger-ring.
A similar ring was found on the finger of a skeleton in the cemetery at Oudenburg, Belgium (Mertens & van Impe 1971, 8, pl. LIX).

Hairpins

Although hairpins are the most common Roman bone and antler finds recovered they are rare in military contexts.

2. 57\006 (015). Length 22 mm. Hairpin with a small, club-shaped head. Incomplete. ?Late Roman.
3. 53\1910 (538). Length 50 mm. Hairpin with a conical head above two collars. Incomplete.
A common earlier Roman form. *c.* 40–200/250. (cf. Greep forthcoming (a)).

Objects used for recreational purposes

Counters\Gaming-pieces

Three possible gaming-pieces were recovered; two are reported here.

4. 53\018 (263). Diam. 18 mm, thickness 4 mm. Type one gaming-piece with flat obverse and reverse surfaces. An earlier Roman type datable to *c.* 40–200/250 (cf. Greep 1986 and forthcoming (a)). Another similar piece came from the same site (53, 3137 (720)).
5. 53\568 (194). Diam. 18 mm, thickness 3 mm. Type three gaming-counter with an obverse surface decorated with a series of concentric circles.

These common types occur throughout the Roman period (cf. Greep 1986 and forthcoming (a)).

Musical instrument

6. 53\1162 (897). Length 35 mm. Small fragment of a lathe-turned bone tube. There is a series of well defined turning marks at the complete end.

This object is one of a small group of lathe-turned tubes which formed parts of musical instruments, probably to be identified with the classical *tibiae*. More complete examples exhibit similar, regular, lathe-turned marks together with regular perforations. The whole object was made up of a series of interlocking tubes, held together by bronze binding. Finds from Britain are rare, and usually unidentified in reports. There are two examples from London (Wheeler 1930, pl. XLVII; unpublished excavations, Museum of London from a second-century context) and another from Gloucester (*ex inf.* H. Hurst, Flavian fortress destruction levels). The most complete British 'set' is from Corbridge where six were found 'lying close together' (Forster & Knowles 1915, fig. 6). There are two possible examples from Colchester (Crummy 1990, no. 2213 fig. 5.69, dated *c.* 44–49; no. 587 fig. 6.49 dated *c.* 49–60/1 or possibly Flavian). Finds from the continent include those from Pompeii (Ward-Perkins & Claridge 1976, no. 199); there are further fragmentary examples in the museums at Naples and Vindonissa, in the Mittelrheinisches Landesmuseum, Mainz, and in the museum at Szöny (Bíró 1994, pl. LXXV, 426). Beal (1983, 319–20, pl. XXIII) illustrates two unprovenanced examples in the Lyon Museum and lists a further one from Autun but none of these are dated.

Tools

Tool Handles

7. 53\1139 (461). Length 43 mm. Rectangular handle with waisted ends and decorated with a series of longitudinal lines on the two wider surfaces, the narrower ones being plain. Traces of an iron blade remain *in situ*.

Though few parallels have been published this is a well-known handle form. Most examples in the group are decorated solely with two outer ridges, the central ridge and groove of the Loughor handle being unusual though it clearly falls well into the type. Handles of the type have been found associated with several different knife-blade forms. An example from London (unpublished, Museum of London) has a small straight-sided knife-blade *in situ* (cf. Manning 1985, fig. 28, type IIB), while two examples from Vindonissa, Switzerland (unpublished, Vindonissa Museum, Brugg) have small and slightly larger curving blades respectively (Manning 1985, fig. 28, types 6d and 7a). A complete knife and handle from London published by Manning (1985, pl. 53, Q14) has a blade similar to one of the Vindonissa pieces (Manning type 6d) and a handle which is only a slight variant on the Loughor example. A handle of this type from Wroxeter (unpublished excavations) has the tang of the blade continuing throughout the handle and terminating in a suspension ring. A similar arrangement is found on one of the Vindonissa handles mentioned above. These and other handles in the group have their upper ends recessed to act as a seat for this ring. Although of the same type the top of the Loughor handle is flat and therefore it is uncertain whether it would have been suspended in such a way.

Few pieces of the same general form are well dated but examples from Vindonissa

(unpublished Vindonissa Museum, Brugg) and Hofheim (unpublished Städtisches Museum, Wiesbaden) are suggestive of a first-century date.

8. 53\314 (889). Length 97 mm. Plain antler handle with part of the iron tang surviving *in situ*. Incomplete. Such handles are common Roman finds and were used to haft a wide variety of implements, although simple knife-blades are the most common as the examples from Colchester (Crummy 1992, no. 1320, fig. 5.36) and Gestingthorpe (Greep 1985, 385–90, fig. 33) demonstrate.

Objects and waste material associated with antler horn and bone working

Waste products

Sixteen waste products, eleven cut from antler, were identified; three are reported here.

9. 53\1162 (901). Length 53 mm. Flat plate of bone, worked into a diamond-shape, with file marks on both surfaces. It is unclear whether this is the final shape intended, although it is possible that the product was to be a decorated veneer sheet.
Such diamond-shapes are uncommon but are known from Roman contexts at Lydney (Wheeler & Wheeler 1932, 147, pl. 23), Gestingthorpe (Greep 1985, 393, fig. 33), Winchester (Cunliffe 1964, figs 24.14 and 66.3), South Shields (Allason-Jones & Milet 1984, 2.137) and Brougham (Greep forthcoming (b)). A similar, unfinished, item, is known from Dover (Philp 1981, 236, fig. 43).
10. 53\1139 (899). Length 83 mm. Flat, shaped, antler plate. The surface has been worked smooth, the reverse flat. This piece was clearly intended for further working although the final product is unclear. There are a number of possibilities such as a plate from a composite handle (cf. Bishop & Dore 1988, 16, fig. 96), or a weaving-comb (cf. Curle 1911, pl. LXVII nos 1 & 4) although the 'teeth' end is cut rather than snapped.
11. 53\595 (893). Length 67 mm. 'Eye-brow'-shaped, flat bone plate. Uncertain function, but probably unfinished and to be considered in the same light as No. 9 above.

Miscellaneous and incerta

12. 53\821 (313). Length 155 mm. Red deer antler tine, sawn from the main beam and possibly a waste product. The upper end of the tine has, however, been hollowed for around 15 mm and displays several knife cuts around this surface. The significance of the hollowing and the knife cuts is uncertain but is suggestive of utilisation rather than simply a waste product.
13. 53\1135 (410). Length 30 mm. Lathe-turned pin-like object. Incomplete. The top has a cone-shaped hollow, 6 mm deep. Function uncertain.
14. 53\1044 (890). Length 93 mm. Tapering antler 'point'. The heavy filing marks on the exterior surface and its D-shaped section probably indicate that this is the end of an antler ear-lath (Coulson 1985; Greep forthcoming (c)).

There are a number of similar pieces in the assemblage at Caerleon (Nash-Williams 1932, 94–6). The type lasts throughout the Roman period and beyond and has been recovered from legionary and auxiliary contexts (Greep forthcoming (c)).

STONE OBJECTS²¹ (FIGS 152–155, PLS XXIV–XXVI) By J. Parkhouse

Introduction

Commentary

As might be expected the collection of stone objects from Loughor is generally utilitarian. Of particular interest is the collection of whetstones (Nos 14–49) and the significance of these, which have been classified into four groups, is discussed further below (p. 417). Discussion of the ten quern fragments (Nos 3–12) is likewise placed before the catalogue entries. Amongst the other material, the mortar (No. 13), and a marble fragment (No. 50), possibly part of a wall

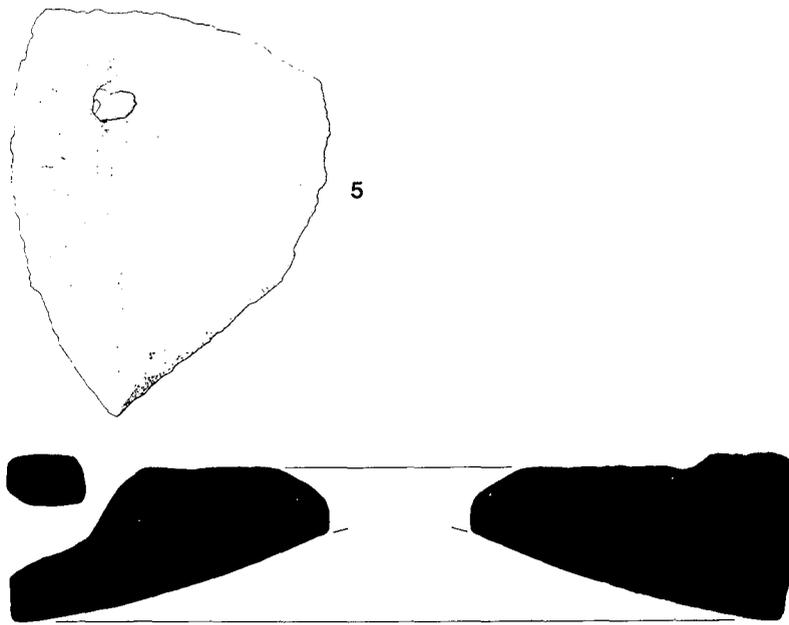
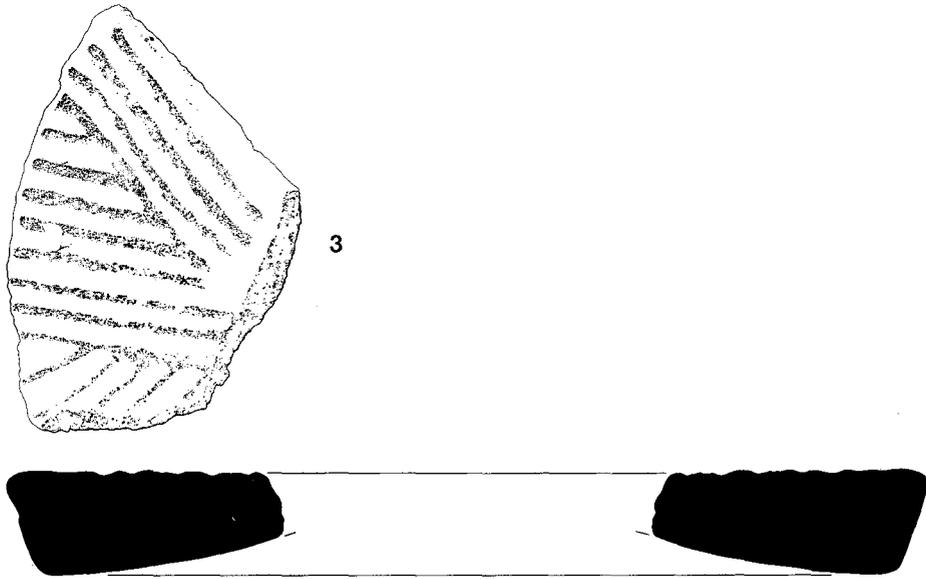


FIG. 152. Objects of stone. Nos 3, 5 (1:4).

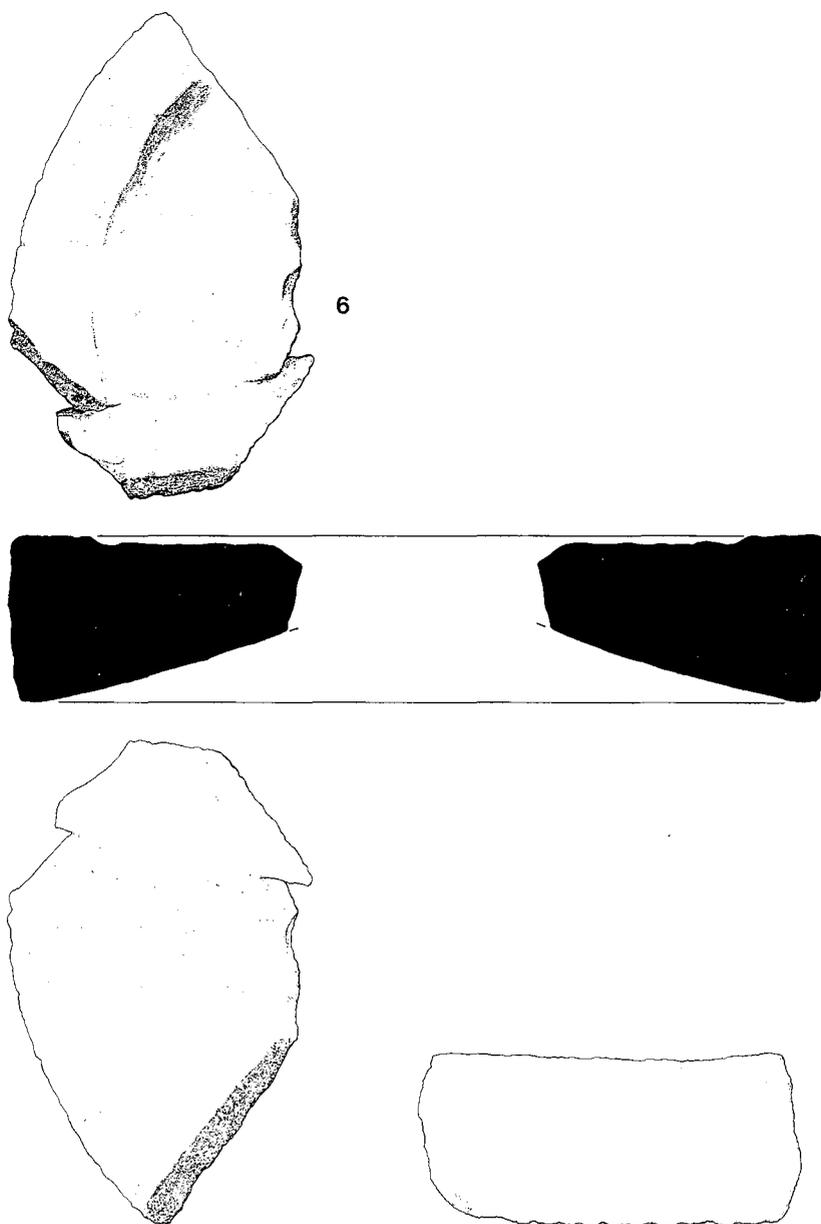


FIG. 153. Objects of stone. No. 6 (1:4).

vener, are of note. Opportunity has also been taken to publish here a solitary shale object (No. 1).

Archive

The full reports are retained in the research archive. Fifty items are reported here.

Catalogue

Objects of personal adornment or dress

Bracelet

1. 57\051 (054). Diam. 56 mm. S. Greep writes: Fragment of a small plain shale bracelet. For similar finds from South Wales cf. Zienkiewicz (1986), 213. Late third\early fourth century.

Objects used in the manufacture or working of textiles

Spindle whorl

2. 53\3373 (729). Max. width 58.9 mm, thickness 17.3 mm, diam. of aperture 8.9 mm. Broken spindle whorl in medium-fine grained sandstone.

Household utensils

Quernstones

Parts of sixteen stones were recovered, these are separated into upper stones, lower stones, and indeterminate in the following proportion (8:3:5) with the indeterminate and one upper stone retained in archive only.

The group of stones from the Loughor fort, although comparatively small (perhaps surprisingly small, given the extent of the work there), is of interest in so far as it provides a group from a specifically military context. What is evident is that all the forms represented are comparatively simple types; the diversity of features such as rynd-chases and hoppers apparent at, say, Carmarthen (where the assemblage is larger; H. J. James and C. Marshall *pers. comm.*) or even Cowbridge (Parkhouse forthcoming) is not to be found here. The inference, therefore, is that a wider range of types is to be found upon the civilian sites of South Wales than upon military sites.

There is a paucity of pre-Roman querns from the region. The limited variety of quernstone forms will be a reflection, at least in theory, of the technology required to maintain a particular form of diet, but little is known of the relationship between the form of a quern and the use to which it was put, or whether this relationship was a critical one. Would any old stone do to grind any type of cereal? If so, do these stones represent a specifically military diet, or a local diet? One part of the assemblage which almost certainly represents military requirements (for no stones of the type occur in the pre-Roman Iron Age in western Britain) is the group of basalt lava querns. These are common imports in the Roman period, and occur on both military and civilian sites. They were mass-produced from a material highly suited to their purpose yet comparatively light (and thus easily transported on campaign). Some of the stones made from local materials and found on fort sites are evidently copies of these types, and details such as the vertical striae engraved upon the circumference of the upper stones were imitated even though they appear to serve no useful purpose. Such direct influences of the imported material are not obvious in the Loughor assemblage. Apart from the lava stones, all the other Loughor items seem to be of local stones (sandstones, gritstones, and conglomerates from the Coal Measures or Old Red Sandstone). The technology though (the characteristic dressings of the grinding surfaces) is distinctly Roman.

Most, if not all the Loughor stones occur residually. Broken stones are incorporated for instance in post-hole packing. Approximately half the stones are from contexts associated with the late third-/early fourth-century reoccupation, but it is not possible to see any chronological developments in the typology. Some stones came from an area close to the back of the rampart at 1-3 Dock Street, and perhaps close to bread-ovens. More work remains to be done, however, to determine precisely where within a fort querns would have been used, stored, and discarded, and whether their distribution within forts has any significance.

Upper stones

3. 55\179 (157). Fragment of upper stone in coarse to medium-grained pink quartzitic sandstone. Well-defined grinding surface, slightly worn. The bedding lies at approximately 15 degrees to the plane of the grinding surface.
4. 54\004 (012). Radius *c.* 160 mm. Fragment from small 'bun' type upper stone with lateral handle-hole. The grinding surface is worn and damaged.
5. 57\416 (268). Fragment of upper stone in basalt lava from the Eifel. Standard type with oblique handle hole containing traces of lead. The grinding surface is worn but the beds

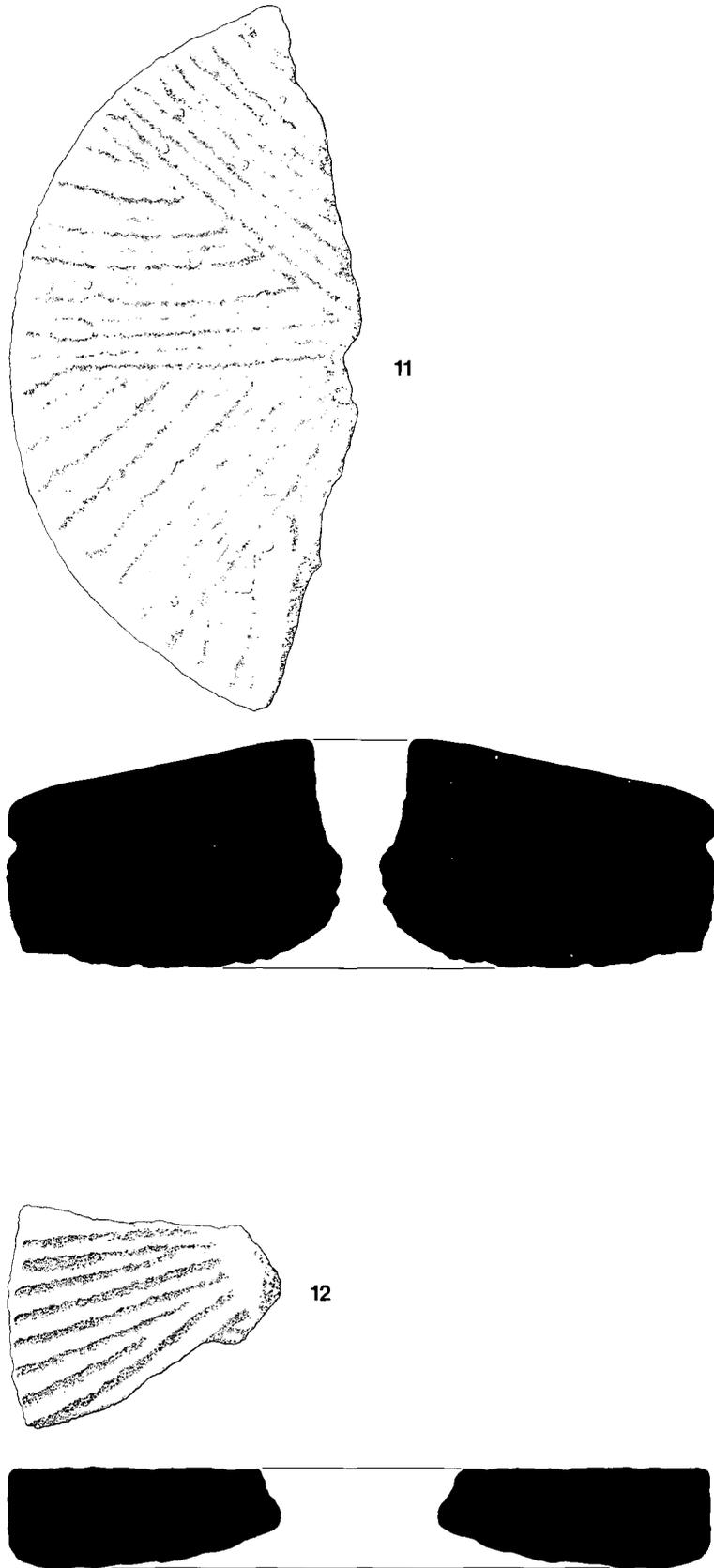


FIG. 154. Objects of stone. Nos 11, 12 (1:4).

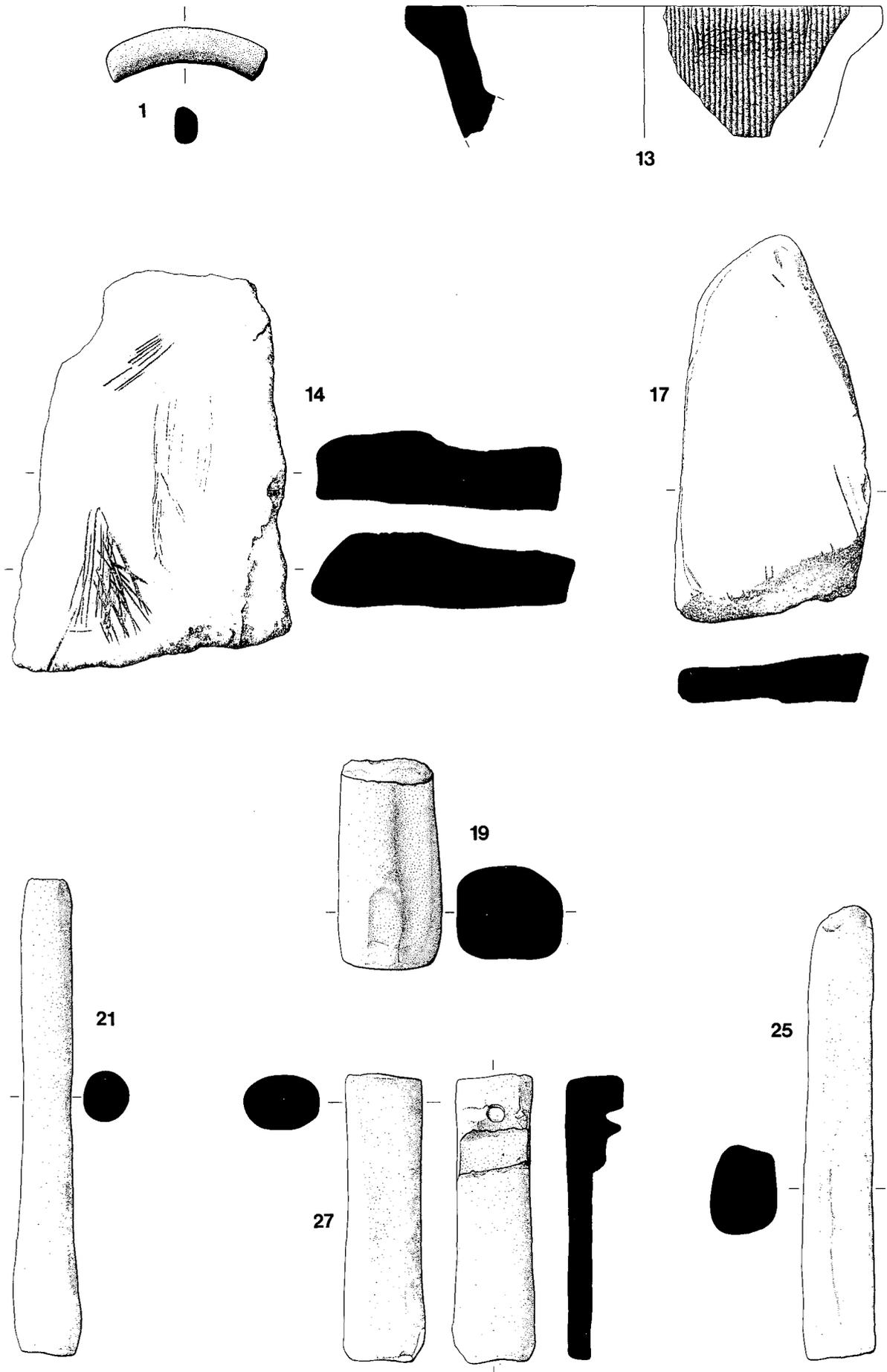


FIG. 155. Objects of stone. Nos 1 (1:1), 13, 14 (1:4), 17 (1:8), 19, 21, 25, 27 (1:2).

are well-defined. Traces of dressing on the upper surface. (The significance of the dressed upper surface is discussed in Parkhouse, forthcoming.)

6. 57\192 (209). Two fragments (joining) of upper stone in basalt lava, similar to No. 5 above, but slightly less worn.
7. 57\115 (127). Original diameter *c.* 460–480 mm. Less than half of a badly damaged upper stone in medium-grained sandstone, with large central aperture. Grinding surface and hopper flange have both been destroyed. (Not illustrated)
8. 53\120 (073). Small fragment from upper stone in medium- to fine-grained micaceous grey sandstone. Traces of a well-defined but rather worn grooved dressing on the grinding surface. (Not illustrated)
9. 53\3728 (680). Thickness 33–41 mm. Two fragments (joining) from upper stone, in medium- to fine-grained gritstone. There are traces of one side of a rynd-socket, quite abraded, on the flangeless hopper. The slightly concave grinding surface is highly worn, and there is virtually no differentiation in the degree of wear between the innermost surface and the skirt. (Not illustrated)

Lower stones

10. 57\037 (040). Diam. of stone 375 mm, diam. of central socket 37 mm. Approximately half of a thin lower stone in very fine-grained sandstone. The well-worn grinding surface bears no traces of any dressing. The base of the stone appears to be water-worn. (Not illustrated)
11. 57\070 (069). Diam. of stone 395 mm; the central spindle-hole is 65 mm deep and tapers from a diam. of 45 mm to one of 30 mm; it does not penetrate the full depth of the stone. Nearly half of a lower stone in medium-grained well-sorted conglomerate. The coarser particles (mostly ≤ 10 mm) are to be found on the grinding surface, which is at approximately 15 degrees to the bedding plane. The well-defined grinding surface shows only moderate wear.
12. 57\087 (128). Fragment from (probably) a lower stone in basalt lava; grinding surface unworn, with radial grooving.

Mortar

13. 53\787 (301) and 53\586 (312). Original diam. *c.* 305 mm. Two fragments of a stone mortar were recovered from different contexts. Although the two do not join, they are almost certainly from the same mortar. The angular lug is 84 mm long. The dressing on the exterior seems to imply the use of a narrow comb-chisel in its manufacture. The interior is polished smooth, especially close to the base where there is a slight indentation or wirble indicative of wear sustained in use.

The original diameter is larger than all but two of the well-known group from Richborough (Dunning 1968).

Petrology: J. Horek writes: This mortar has been made from a medium-grained basic igneous rock. In transmitted light, a thin section of this rock shows an essential mineralogy of olivine, often partially altered to secondary materials (possibly iddingsite), clinopyroxene, and plagioclase feldspar. Minor oxides (magnetite or ilmenite) are also present within the rock. From this mineralogy the rock can be more precisely classified as olivine dolerite. The low state of alteration of the igneous minerals suggests that the rock is either Carboniferous or Palogene in age. Palogene olivine dolerites are found as dykes in England and Wales whereas Carboniferous olivine dolerites are found as extensive lava flows (e.g. Clee Hills, Shropshire; Rowley Regis, West Midlands). From the petrological evidence presented here it is not possible to identify the exact provenance of the olivine dolerite, although this might be possible if a whole-rock geochemical analysis were obtained.

Tools

Whetstones and sharpening stones

Thirty-five items were examined, the majority of which could be positively identified as whetstones. In many instances distinct areas and patterns of wear were to be observed, making the Loughor stones a useful assemblage.

Little has been published on whetstones from large Roman sites; until recently there was a tendency to treat them summarily or ignore them entirely. This is regrettable; whetstone petrology may be indicative of trade patterns (as is well-known for the Anglo-Saxon material; e.g. Ellis 1969) and use of local resources, whilst analysis of wear patterns and shape may point towards an identification of the implements which they were used to sharpen.

Most of the whetstones from Loughor were made from fine or very fine-grained sandstone with varying quantities of mica and varying in colour from red, through varying degrees of grey, to yellow or green. No. 32 is of a medium-fine sandstone similar to a fine gritstone. Four items (Nos 22, 26, 28, and 29) are medium sandstones of a somewhat softer texture and/or weaker cementation; in the case of No. 26 the cementation has broken down. These materials are less conducive to being polished than the micaceous sandstones, wear resulting from utilisation is harder to recognise and it is for this reason, rather than the inherent suitability of the stone *per se*, that a higher proportion of the doubtful examples belong to this group. The large sharpening stones of Group A are all fashioned from an identical medium-fine grained slightly micaceous sandstone and a common source is quite possible. The doubtful item No. 26 is of a similar material. The fine-grained whetstones and hones, although broadly comparable in terms of petrology, show, as already mentioned, a fair degree of disparity, and no two stones are macroscopically indistinguishable. A common precise geographical origin is therefore unlikely, and the selection of fluvial/littoral material, or material within the glacial drift is to be suspected. Coal measure sandstone/greywacke (Ellis Type IIb–III) is frequently encountered amongst the hones of southern Britain (Moore and Oakley 1979). All the Loughor material appears to be derived from the local Old Red Sandstone or Upper Coal Measures.

The Loughor material is divided here into four groups based upon shape:

- Group A: Large flat sharpening stones;
- Group B: Whetstones with sub-circular cross-section;
- Group C: Whetstones with intermediate cross-section (usually with one or more flat face);
- Group D; Whetstones with predominantly flat surfaces, generally rectangular, sub-rectangular, or trapezoidal cross-section.

The mode of use of these four basic groups appears to have been different, although Group C stones exhibit some of the characteristics of Groups B and D.

In a few instances amongst the Group C and D stones, which have flat surfaces, the pattern of wear appears to show a distinct preference for a particular honing movement, indicative of the stone being persistently held in one hand (usually the left) whilst the blade is manipulated by the other (right) hand. There are six such instances amongst the Loughor assemblage; one (No. 25) appears to have been used by a left-handed person and five (Nos 23, 32, 38, 39, and 47) by a right-handed person.

Studies of handedness suggest that laterality is not a culturally-derived attribute (Flowers 1987; Hasdyck and Petrinovich 1977). Right-handedness, or dextrality, seems to be markedly predominant throughout human populations. Specific laterality may be hard to identify in some individuals, but the incidence of dextrality is quoted as being between 64 and 96 per cent of present-day populations, a proportion with which our tiny Loughor sample appears to be in accord.

Group A: large flat sharpening stones

These are large slabs, usually with one slightly concave area (although No. 15 differs in this



PLATE XXIV. Stone No. 16.

respect) and often with small straight grooves where the stone has been cut or incised. Similar stones are recorded from Caerleon Roman Gates (Parkhouse and Evans 1992). The function and method of use are not entirely clear. The concavity of what evidently appear to be grinding surfaces would rule out the treatment of a long straight blade. Only if they were used for curved (and relatively small) blades would a significant proportion of the stone be in contact with the implement.

An alternative hypothesis is that these items may be related functionally to the very much smaller palettes used for preparation of cosmetics or medicines (e.g. Crummy 1983, 57; nos 1865–1868), although the presence of the several cut marks on these items is difficult to explain.

The cuts and grooves on these stones may be best explained as the results of sharpening points or very fine blades, or possibly even bone pins. It is possible therefore that these Group A stones were used for more than one purpose.

14. 55\191 (151). Large fragment of fine-grained micaceous grey sandstone. One side is dished (6 mm deep); around the edges of this depression narrow (<2 mm) grooves have been scored in different directions.
15. 69\234 (156) Fragment, similar to No. 18 below, but with one face and one edge worn; both of which exhibit narrow shallow grooves, although the means by which these were scored is uncertain. (Not illustrated)

16. 57\085 (157). Dimensions max. 710 by 650 mm. A very large, roughly trapezoidal slab in fine-grained grey micaceous sandstone. Part has been dished and worn smooth and within this area are a few smaller cuts, up to 90 mm in length; adjacent to it are a large number of grooves up to 240 mm in length and 5 mm wide. (PL. XXIV)
17. 57\276 (204). Fine-grained grey micaceous sandstone slab, similar to No. 14 but larger, with one surface dished and worn (polished smooth in some places) and traces of narrow grooves around the edge.
18. 53\283 (191). Fine-grained grey micaceous siltstone fragment, fracture parallel to the general plane of the bedding. One face worn, possibly as a result of having been used for sharpening, or possibly by river action. There was no sign of a concave grinding area on this fragment; however in view of its petrological similarity to Nos 15–17 it is included in this group. Within Group A, this item alone could have been used effectively for long straight blades. (Not illustrated)

Group B: whetstones with sub-circular cross-section

These stones lack level grinding surfaces entirely, and their whole circumference could be used. In terms of the technique of use they were probably equivalent to a present-day kitchen steel, being rubbed along the entire length of the blade. These stones would have been used to best advantage with long blades such as sickles.

19. 69\229 (147). Max. dimensions 72 (originally longer) by 36 by 30 mm. Fragment of pebble in fine-grained micaceous grey sandstone varying in cross-section from sub-circular (at the fracture) to sub-rectangular (at the end). The only truly flat surface, however, is unworn. Apart from this area, the whole surface is worn apart from the end and the fracture; the stone tapers towards the fracture. Although use of such pebbles as whetstones is virtually impossible to prove, the shape and, in particular, the tapering away from the end points towards its use for sharpening.
20. 57\196 (215). Max. diam. 19 mm; surviving length 83 mm (the item was almost certainly longer originally). Fragment in fine-grained micaceous grey sandstone, split longitudinally. (Not illustrated)
21. 57\088 (084). Max. diam. 26 mm, length 165 mm. Complete whetstone, in fine-grained micaceous dark reddish-grey sandstone.

Group C: whetstones with intermediate cross-section

This group comprises those stones which do not fall readily into Groups B or D; they may have one or more flat faces, but use in the manner suggested for Group B is not precluded. Some members of this group (e.g. No. 23) have distinct areas of wear indicating a certain degree of use in the manner of the members of Group D.

22. 55\036 (027). Max. dimensions 43 by 20 by 13 mm (the length is clearly incomplete). Fragment of small elongated pebble in fine-grained grey micaceous sandstone with oval cross-section. None of the surfaces show any wear which would necessarily demonstrate use as a whetstone. (Not illustrated)
23. 69\056 (101). Max. dimensions 60 by 26 by 16 mm (length incomplete). Fractured fragment of whetstone in fine-grained green-grey micaceous sandstone with ferruginous accretion at one end; oval cross-section with two opposing flattened sides, both worn, the wear on one of which being apparently consistent with use by a right-handed person. (Not illustrated)
24. 57\089 (125). Max. dimensions of the item as it survives: 75 by 24 by 46 mm. Fragment of whetstone in medium-fine-grained slightly micaceous sandstone with irregular cross-section. Areas of particular wear are less well-defined on this stone than many of the other examples in the same general type of stone. (Not illustrated)
25. 57\085 (158). Max. dimensions 155 by 36 by 26 mm. Elongated pebble in fine-grained

sandstone with occasional mica and with irregular but largely sub-rectangular cross-section. All surfaces are apparently worn, one particularly so where a dished area occurs along part of one edge – the remainder is of a length which would fit into the hand. The wear is consistent with the sharpening of a small blade such as a scalpel. This would have been facilitated more evenly if the stone was held in the right hand, suggesting that the object may have been used by a left-handed person.

26. 57\415 (258). Dimensions 84 by 29 by 22 mm. Possible whetstone: pebble in medium- to fine-grained yellow sandstone with roughly sub-rectangular cross-section. The accretion matrix has broken down and the structure is disintegrating to sand; consequently no polished surfaces have survived. Unless the breakdown of the matrix is due to the chemical environment of deposition (which does not appear to have been exceptional) it is difficult to envisage this stone having been used as a whetstone, and its identification as such must be a little doubtful. (Not illustrated)
27. 57\088 (089). Max. dimensions 99 by 30 by 19 mm (sufficient of the stone survives to show that these are the original dimensions). Incomplete whetstone, originally in three pieces, in micaceous siltstone. Flattened oval cross-section. The most interesting feature is the partially bored hole at one end, 5 mm deep. This stone lacks the slightly polished finish of most of the other stones in this material, and it may be that it was never used, the fracture being caused during the drilling of the hole.
28. 53\2035 (582). Max. dimensions 79 by 28 by 25 mm. Probable small whetstone, in medium-grained slightly micaceous pale yellowish-grey sandstone with sub-circular cross-section and two flattened sides. There are no obvious zones of wear and its identification as a whetstone may, therefore, not be entirely secure. Possibly for a small sickle? (Not illustrated)

Group D: whetstones with predominantly flat surfaces (see PLS XXV–XXVI, for Nos 33, 37, 39, 40, 42, 46 and 47).

This is a group which is diverse in terms of size and shape, but all the members possess evidence for the utilisation of a flat face. Where honing took place on a flat face, the blade is moved against a more or less static stone, rather than vice versa (as with Group B). Some of the stones of Group D were evidently used for very small blades (e.g. No. 46); indeed it is not impossible that they were used for sharpening surgical implements (see, for instance, the scalpels described in Jackson 1986, items 1–9).

As with Group A, some of the Group D stones bear traces of grooves. Whilst it is possible that some of these may be the traces of the sharpening of metal points, most of the grooves on Group D stones are much narrower and shallower than those of Group A, and are more likely to be the results of the careful final polishing of small blades.

29. 55\179 (176). Length 69 mm (the piece was evidently originally longer), rectangular cross-section tapering from 29 by 21 mm to 22 by 22 mm. Fragment of fine-grained micaceous grey sandstone. There is wear on one face which would not be inconsistent with use as a whetstone. (Not illustrated)
30. 55\283 (192). Max. (and original) length 98 mm, max. dimensions of intact cross-section 31 by 20 mm. Whetstone in fine-grained micaceous sandstone (Old Red Sandstone) with irregular but basically sub-rectangular cross-section. One face is largely missing as a consequence of fracture, but all faces show considerable wear. (Not illustrated)
31. 55\280 (200). Max. dimensions 75 by 31 by 8 mm. Complete flat whetstone in fine-grained grey sandstone. The faces and long edges are worn evenly. There is a narrow zone of distinct utilisation along the side of one face (no doubt representing fine honing) and a small series of notches near to one end where a blade has been run across the edge. A few other scratches on this surface (best visible with a hand lens) may perhaps be post-depositional.
32. 55\092 (099). Max. dimensions 93 by 38 by 23 mm. Fragment of whetstone in light grey

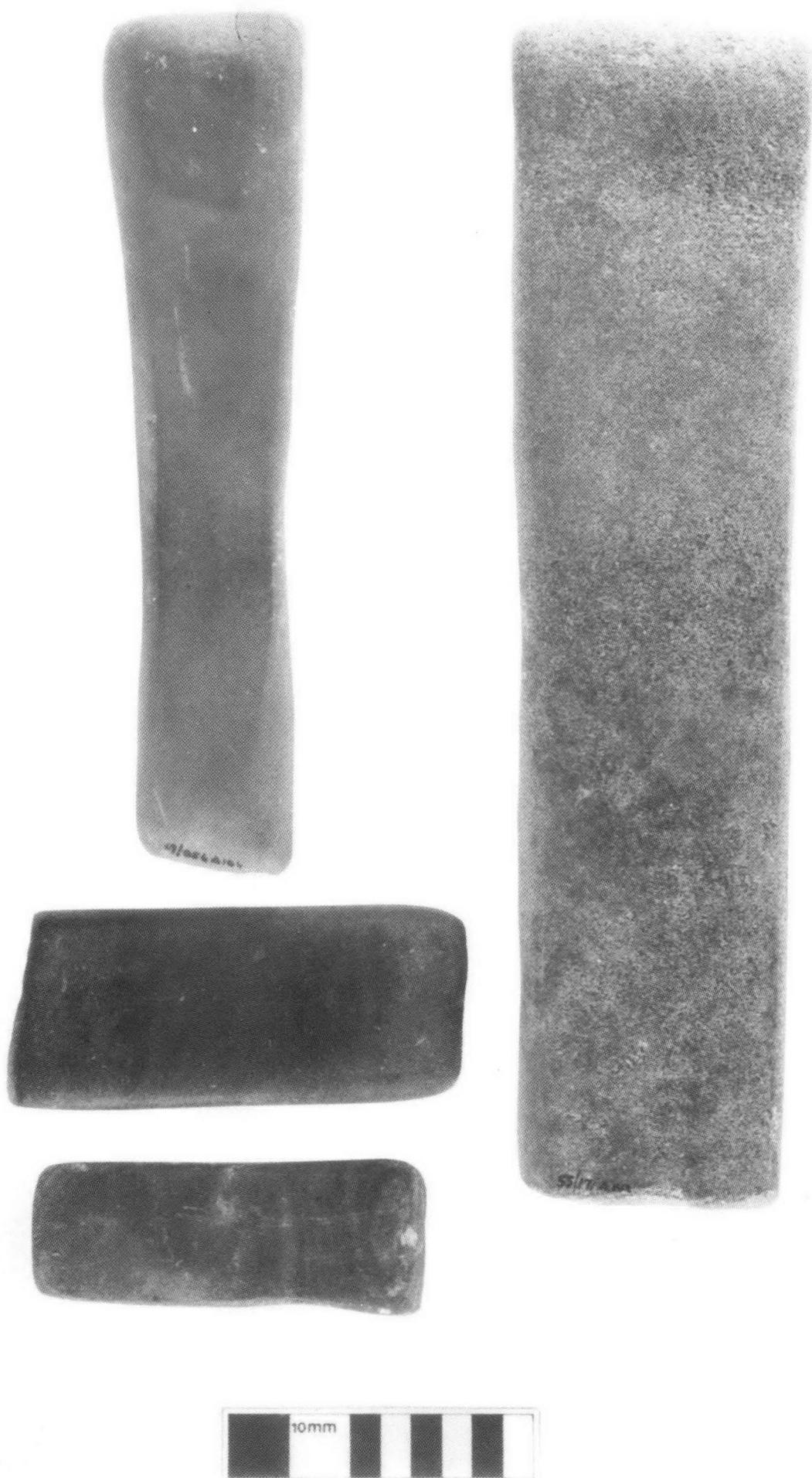


PLATE XXV. Stone Nos 37, 40, 42, 47.

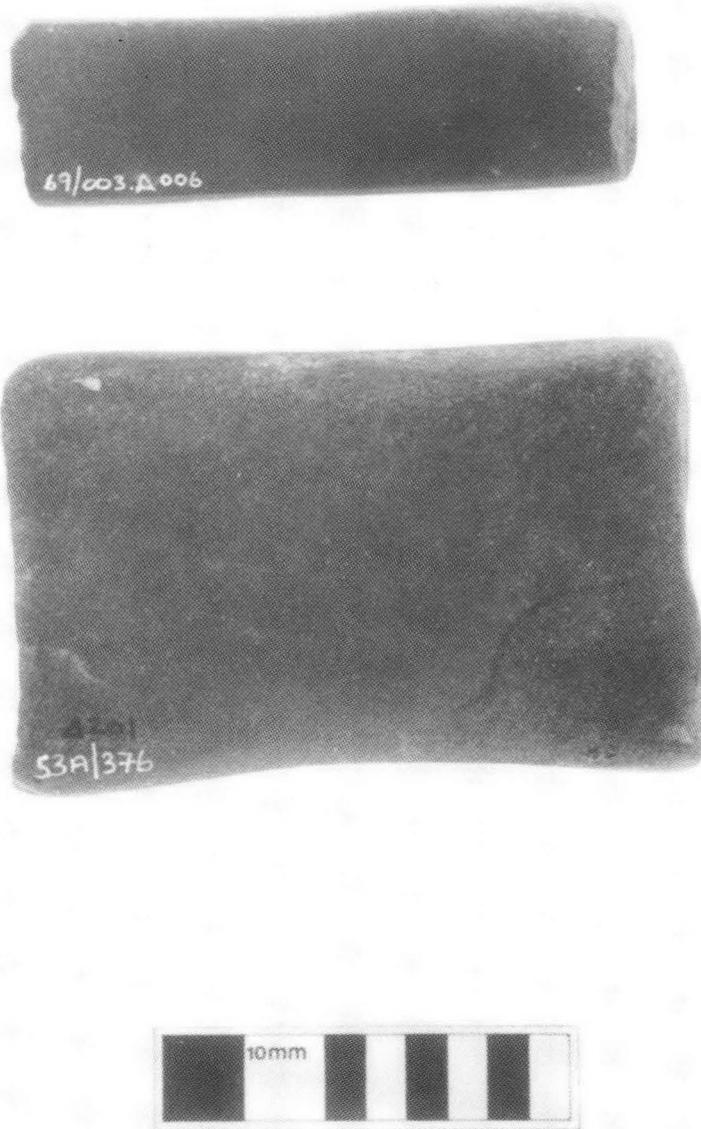


PLATE XXVI. Stone Nos 40, 47.

medium-fine-grained pale grey sandstone with rectangular cross-section. All the surfaces show some wear; that on one of the long edges is particularly apparent and the surface profile is that which, it is suggested, would indicate use by a right-handed person. Both the original ends of the stone are missing. (Not illustrated)

33. 55\171 (142). Max. dimensions 186 by 49 by 14 mm. Long flat whetstone with sub-rectangular cross-section in medium-fine-grained grey sandstone.
34. 55\307 (225). Apparently incomplete; length 93 mm, sub-rectangular cross-section tapering from 36 by 14 mm at one end to 24 by 16 mm at the other. Whetstone fragment in medium-fine grained micaceous yellow-grey sandstone. One face worn. (Not illustrated)
35. 69\005 (028). Max. dimensions 123 by 30 by 28 mm. Whetstone, apparently complete, with rectangular cross-section, in fine-grained grey micaceous sandstone. Two faces are slightly dished, probably as a result of use. (Not illustrated)
36. 69\227 (160). Max. dimensions 156 by 35 by 25 mm (the length is incomplete). Whetstone fragment (fractured), made from an elongated pebble in fine-grained heavily micaceous grey sandstone with sub-rectangular cross-section. All four faces show apparent signs of wear. (Not illustrated)
37. 69\056 (104). Dimensions 134 by 33 by 16 mm. Complete whetstone, in fine-grained micaceous pinkish-grey sandstone, with irregular but generally sub-rectangular cross-

- section. One face in particular shows considerable wear, possibly consistent with use by a right-handed person.
38. 69\003 (006). Max. dimensions 75 by 22 by 15 mm. Small whetstone, probably complete, in fine-grained micaceous dark brownish-grey sandstone, with sub-rectangular cross-section. Both the sides and the long edges show considerable signs of wear, and the wear on the main sides would appear to be consistent with use by a right-handed person.
 39. 57\047 (039). Max. dimensions 218 by 39 by 38 mm. Whetstone with rectangular cross-section in fine-grained grey micaceous sandstone. Three of the faces are well-worn, apparently through use. It is likely that this stone was originally longer. (Not illustrated)
 40. 57\085 (317). Max. dimensions 61 by 29 by 19 mm. Whetstone, in a light grey fine-grained slightly micaceous sandstone with sub-rectangular cross-section. All sides are worn, and one is polished. The long dimension is apparently incomplete.
 41. 57\090 (113). Max. dimensions 116 by 42 by 13 mm (the length is probably incomplete). Probable flat whetstone fragment in fine-grained micaceous grey sandstone with sub-rectangular cross-section. Both principal faces and both long edges exhibit wear; some minute striations along the length of the stone are visible. (Not illustrated)
 42. 57\117 (121). Max. dimensions 83 by 22 by 18 mm (the length is incomplete). Whetstone is fine-grained dark grey micaceous sandstone with parallelogram cross-section. All faces are worn, two of them particularly so.
 43. 57\196 (215). Length 96 mm. Irregular pebble in fine-grained sandstone. All surfaces have been polished. It is difficult to determine whether this is a result of use as a whetstone, or the consequence of fluvial wear. (Not illustrated)
 44. 53\1997 (546). Max. dimensions 84 by 41 by 38 mm. Fragment of fine-grained micaceous grey sandstone with sub-rectangular, almost square, cross-section. One edge is sufficiently worn to suggest use as a whetstone. (Not illustrated)
 45. 53\310 (139). Surviving dimensions: length 322 mm, thickness 57 mm, max. width (incomplete) 55 mm. Fragment of whetstone in fine-grained grey to red slightly micaceous sandstone with trapezoidal cross-section. Two, perhaps three, surfaces appear to have been utilised; the fourth face is clearly a fracture. It is possible that this piece is the bevelled edge of a much larger slab of Group A type, although the worn nature of the flat faces points towards secondary use as a whetstone, and the evidence for any original dressing is no longer visible. (Not illustrated)
 46. 53\376 (201). Max. dimensions 84 by 51 by 15 mm. Flat whetstone in fine-grained micaceous dark grey sandstone with rectangular cross-section. The two faces are well worn, also the long edges, one of which is particularly worn and has a concave profile as a consequence. The wear on the narrow edge would point to this stone being used for small blades. Complete, although there is an area of damage *c.* 25 by 28 mm on one face.
 47. 53\802 (315). Max. dimensions 64 by 24 by 13 mm. Small whetstone in fine-grained micaceous grey sandstone. Originally sub-rectangular, the two main faces and the long edges are well worn, and one of the sides considerably so. The concavity of this side is consistent with use by a right-handed person. The main faces also have notches close to the ends where the blade has been run across the edge.
 48. 53\3182 (905). Max. length (incomplete) 65 mm; rectangular cross-section 60 by 38 mm. Fragment of whetstone in fine-grained pinkish grey sandstone. Traces of possible wear on all four main faces. (Not illustrated)
 49. 53\3390 (727). Dimensions 127 by 30 by 22 mm. Complete whetstone, with rectangular cross-section, in fine-grained grey sandstone. Most of the surfaces are dark grey (?burnt) and covered with sooty, slightly oily, ferruginous concretions, which make inspection of the surface difficult; all four principle surfaces are flat, level, and worn, although there is none of the distinctive wear pattern visible on many of the other Group D stones from Loughor. (Not illustrated)

Miscellaneous and incerta

50. 53\2027 (551). Small fragment of marble, worked, with vestiges of a rebate along one edge. The function is uncertain, but the item may perhaps be the edge of a wall veneer.

NOTES TO Chapter 5

1. I am indebted to Rodney Hudson of Newport Museum for his help in the identification of the Loughor coins.
2. Another sestertius, of Antoninus Pius, dated to 145, occurred as a stray find outside the excavation area (from beneath a garage in Dock Street).
3. Kenyon (1987, 26) gives parallels for this practice in his discussion of Claudian copies at Colchester.
4. In the catalogue inverted commas are used where ascribing copies and in giving the dates when these issues are thought to have been circulated, except in the case of barbarous radiates where no specific imitation applies, and where the dates given refer to the period of circulation of all unascrbed issues of this type. An asterisk by the side of the Individual Find Record number (IFR No.) of a particular coin indicates that this coin is no longer available for study and information given is that available upon which reasonable reliance can be placed.
5. No. 92 from the reduced fort rampart, Nos 97 and 98 from a demolition layer above the first fort, and No. 100 from the fill of a robber-trench of the stone *praetorium* (Building 12) on Site 53.
6. This figure represents the total number of objects which survived the fire of 1983, and thus the absolute minimum. See note on the nails within this report.
7. I would like to thank Dr Peter Carrington of the Grosvenor Museum for information about the Chester finds, and for allowing me to mention them in advance of publication.
8. For example Type A sheaths of Group A ('Dunafoldvar Type') and the related Group B ('Moers-Asberg Type') (Scott 1985, appendix 2, nos 4-19).
9. I am indebted to Mr R. A. Rutland of the Jewry Wall Museum, Leicester, for this and other parallels.
10. Petrological analysis of certain items was carried out by David Williams of the Archaeology Department of Southampton University and a full report is retained with the archive.
11. By context association this lamp should date to late first/early second century or earlier.
12. By context association this lamp should date to the early second century or earlier.
13. I should like to thank Sheila Hamilton-Dyer for kindly identifying and commenting on the fish bones for me. Thanks are also due to Bruce Levitan for identifying the whale mandible.
14. These figures do not include horn core and antler fragments, which may have been collected to be worked.
15. The figures are based on the following numbers 53 - 2425; 55 - 34; 57 - 627; 69 - 17.
16. The withers heights have been estimated using the averages of Fock's conversion factors for the metapodia and Matolcsi's factor for the radii (von den Driesch and Boessneck 1974, 336).
17. A range of pathological features and skeletal abnormalities were noted; it has not, however, been possible to discuss these with a veterinary pathologist.
18. Using the methodology of Grant (1982).
19. On the use of cheese in the Roman military diet cf. Davies, R. W., 1971, 127.
20. These have been calculated using Teichert's factors (von den Driesch & Boessneck 1974, 339).
21. The writer is grateful to Dr R. M. Owens and Ms J. Horek of the Department of Geology, National Museum of Wales, for comments on the geological provenance of some of the items, and to Heather James of Dyfed Archaeological Trust for supplying a draft of the Carmarthen quern report in advance of publication.

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ABBREVIATIONS

- ANRW* Temporini, H. and Haase, W. (eds), *Aufstieg und Niedergang der Römischen Welt* (Berlin, 1976–).
- BAR & BAR (S) British Archaeological Reports and British Archaeological Reports (International Series) (Oxford).
- CIL* *Corpus Inscriptionum Latinarum* (Berlin, 1866–).
- Colls *et al.* Colls, D., Etienne, R., Lequement, B. and Mayet, F., 'L'ave Port-Vendres II, et le commerce de la Betique a l'époque de Claude', *Archaeonautica* 1.
- Eburacum* Royal Commission on Historical Monuments, *An Inventory of the Historical Monuments in the City of York. Vol. 1. Eburacum, Roman York* (HMSO, London, 1962).
- Glam. Invent.* Royal Commission on Ancient and Historical Monuments (Wales), *An Inventory of the Ancient Monuments in Glamorgan. Vol. 1. Pre-Norman. Part II. The Iron Age and Roman Occupation* (Cardiff, 1976).
- HBMCE Arch. Rep. Historic Buildings and Monuments Commission for England, *Archaeological Report*.
- HBMCE Occ. Pap. Historic Buildings and Monuments Commission for England, *Occasional Paper*.
- Limes* 8 Birley, E., Dobson, B. and Jarrett, M. G. (eds), *Roman Frontier Studies* (Cardiff, 1974).
- Limes* 9 Pippidi, D. M. (ed.), *Actes du IX Congrès International d'Études sur les Frontières Romaines* (Bucharest, 1974).
- Limes* 10 Bogaers, J. E. (ed.), *Studien zu den Militärgrenzen Roms II: Vorträge des 10 Internationalen Limeskongress in der Germania Inferior* (Köln, 1977).
- Limes* 11 Fitz, J. (ed.), *Limes: Akten des XI Internationalen Limeskongress* (Budapest, 1977).
- Limes* 12 Hanson, W. F. and Keppie, L. J. F. (eds), *Roman Frontier Studies 1979* BAR (S) 71 (3 vols) (Oxford, 1980).
- Limes* 13 Planck, D. (ed.), *Studien zu den Militärgrenzen Roms III: 13 Internationalen Limeskongress (Aalen, 1983)* (Aalen, 1986).
- Limes* 14 Veters, H. and Kandler M. (eds), *Akten des 14 Internationalen Limeskongress 1986 in Carnuntum* (Wien, 1990).
- Limes* 15 Maxfield, V. and Dobson, M. J. (eds), *Roman Frontier Studies 1989. Proceedings of the XVth International Congress of Roman Frontier Studies* (Exeter, 1991).
- P-W Pauly-Wissowa-Kroll, *Realencyclopädie der klassischen Altertumswissenschaft* (1894–).

- RFWI Nash-Williams, V. E., *The Roman Frontier in Wales* (Cardiff, 1954).
RFW2 Nash-Williams, V. E., *The Roman Frontier in Wales*, 2nd edn revised
by Jarrett, M. G. (Cardiff, 1969).
RIB Collingwood, R. G. and Wright, R. P., *The Roman Inscriptions of Britain*
(Oxford, 1965).
RIC Mattingly, H., Sydenham, E. A., Sutherland, C. H. V., and Carson,
R. A., *Roman Imperial Coinage* (10 vols) (London, 1923–1970).

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