

## EXCAVATIONS AT PARK STREET, 1954-57

By A. D. SAUNDERS

In June 1943 a Roman villa was found during gravel digging at Park Street, near St. Albans. Later that year, and in 1944, the site was excavated and recorded by Mrs. H. E. O'Neil.<sup>1</sup> During the summer of 1954 further discoveries of buildings were made as the gravel digging extended into the field east of the villa. These were reported to the Inspectorate of Ancient Monuments of the Ministry of Works, and the writer was invited to excavate the sites before they were completely destroyed. Excavation took place in July and August, 1954.<sup>2</sup> More traces of buildings were found early in 1955, and another season of excavation was carried out in February and March of that year. The field continued to be observed as gravel digging proceeded, and further fieldwork was undertaken during 1956 and 1957.

The areas examined between 1954 and 1957 lay in the field immediately east of the villa, and along the low ground beside the course of the River Ver (Figs. 1, 2).<sup>3</sup> The field sloped gradually eastwards and the buildings excavated lay somewhat below the level of the villa, which was on the slightly higher portion of Bricket Field, 30 to 40 ft. above river level. East of the river was Watling Street, leading to Verulamium,  $2\frac{1}{4}$  miles to the north.

There were no surface indications of structures, and an air photograph, taken when the 1955 season of work was in progress, provided little more information.<sup>4</sup> It was not, however, a particularly suitable time of year for archaeological air photography. In almost every case sites were discovered during the course of gravel digging. The field had been cultivated previously and there were between 9 and 18 ins. of plough soil over the structures. Walls had been robbed for building materials, some of the disturbance being as recent as the nineteenth century. There was no time available for trial trenching the whole field, desirable though it was. In 1955 volunteers from the Watford Archaeological Society, under the direction of Mr. Peter Curnow, dug a line of trial trenches in the northern part of the field (Site Q), but, although signs of occupation were found, no more structures appeared. The investigation of areas of occupation along the riverside was mainly due to Dr. C. W. H. Ingoldby over the course of several years.

<sup>1</sup> Helen E. O'Neil, 'The Roman villa at Park Street, near St. Albans, Hertfordshire: Report on the excavations of 1943-45', *Arch. J.*, CII, 21.

<sup>2</sup> Permission to excavate was readily given by Messrs. Inns & Co. Ltd., the owners of the field and the firm working it for gravel. I am most grateful for their willing co-operation, and particularly for the assistance given me by Mr. L. Flitney and others of their employees. With the work of excavation I was greatly helped by Margaret Saunders, Peter Curnow, John Lunn, then Director of Verulamium Museum, and Dr. C. W. H. Ingoldby. Mr. George Debenham of the Ministry of Works was responsible for much of the arduous work. Mr. Michael Teague of Park Street and many others, too numerous to mention individually, helped at various times. I am most grateful to them and to my colleagues in the Ancient Monuments Inspectorate for much advice and encouragement. Acknowledgements to those who kindly examined pottery and other finds are made elsewhere in the text. The pottery and small finds were drawn by Mrs. E. Fry-Stone and Mr. D. S. Neal. Lastly, my special thanks are due to the late Mr. B. H. St. J. O'Neil and Mrs. H. E. O'Neil for their constant help and suggestions towards the interpretation of this site.

<sup>3</sup> National Grid Reference: 52/147032.

<sup>4</sup> R.A.F. F22 58/1690 21 Mar. 1955 0010.

The buildings, graves and areas of occupation, which were examined, clearly appear to be associated with the villa; the manner of masonry construction is closely similar, as is borne out by Dr. N. Davey's analysis of the building mortars (see p. 133). It is possible to link the sequence of construction with the main building periods of the villa. The same subdivision of the historical development has been continued, and, because of the close association, this report follows Mrs. O'Neil's in such details as hatching of plans and the discussion of pottery. An attempt has been made to avoid duplication and overlapping in the expectation that both reports would be considered together.

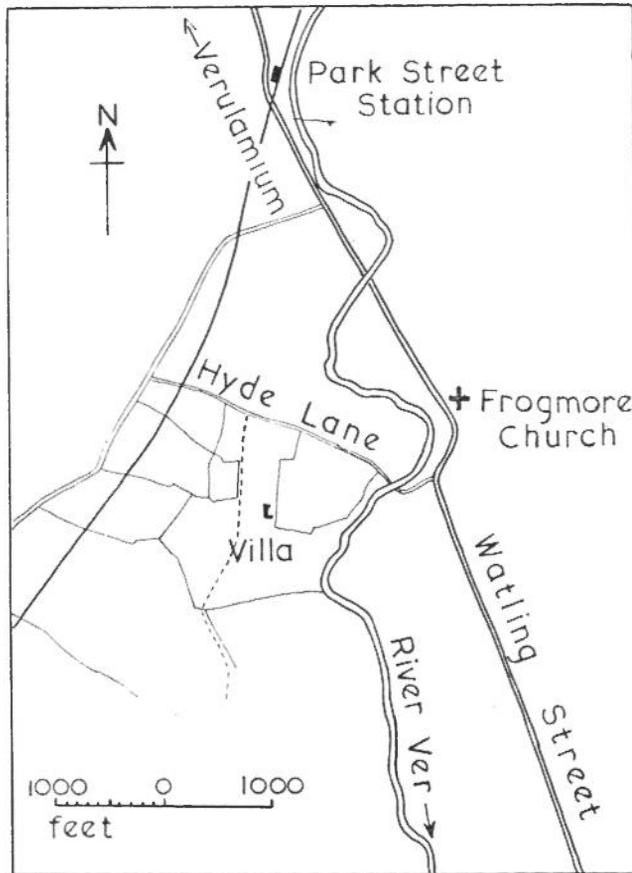


Fig. 1. Map showing position of Villa

## THE EXCAVATIONS

### BATH BUILDING

The bath building (Fig. 3) was situated about 115 ft. north-east of the villa, and was excavated in the 1955 season. The foundations and lower courses of the walls were comparatively undisturbed by nineteenth-century and later

digging. Although a wide, shallow trench was scooped out of the upper layers on the south side by the gravel diggers in their initial clearance (Pl. IVA), it was possible to obtain much of the plan. The greatest length of the building was 61 ft. 9 ins., and in breadth it reached 57 ft. It was occupied from the second century A.D. to well into the fourth century and in its construction belonged to Periods VII and VIII of the villa's chronology. Rooms VII, VIII, IX and X formed the original bath suite in the middle of the second century. Rooms I, II, IIA, III, VI and XI appeared to be additions of about 300 A.D. and the early fourth century. Although these additions would seem to relate to Period VIII, they are not all contemporary and various subdivisions can be made.

*Period VII (Mid second-century A.D.): Rooms VII, VIII, IX and X*

The original bath suite was probably a compact block consisting of four or five rooms providing the usual amenities expected in such a building. Apart from the four rooms mentioned, there were traces of another extending north of VIII underlying Room III of Period VIII. The walls were built generally of flint, with a buff-coloured mortar, and were between 2 ft. and 2 ft. 3 ins. in width. Tiles were used only for the construction of *pilae*. The plunge bath and the lower floors of the hypocausts in Rooms VII, VIII and IX were set into the natural yellow clay and the flint courses of the walls of these rooms did not commence until about 1 ft. 9 ins. above the lower floor level. The walls of the hypocausts, flint as well as clay, were lined with a pink plaster which material was also used for bedding the *pilae* tiles. The floors were constructed of *opus signinum*, 3 ins. thick, over a foundation of flints.

Within this earlier structure there was no stratified dating evidence, and the pottery and other material that was found belonged to the fourth century; this suggested that these rooms continued in use into the later stages of the villa's history.

*Rooms VII and VIII*

These are best considered together for they seemed to be one structurally, although divided into two parts by two blocks of clay between the *pilae*. They probably formed the *caldarium*. Internally the total length was 23 ft. 11 ins., and the width 9 ft.

Room VII was almost completely destroyed above floor level by the gravel digging operations but a little of the wall plaster and some of the flint walling remained to show the general outline of the room with its apsidal southern end; the latter probably indicates the position of a hot bath or a hot water basin. On the western wall was a clay offset, 2 ft. 6 ins. wide, faced like the rest of the wall with pink plaster, and there was probably a similar offset on the eastern wall; although the offset itself had been destroyed, it is significant that there was no plaster face to the wall for a length of 2 ft. 6 ins. opposite the western one. Traces of only six *pilae* had survived; in each case the mortar adhering to the floor provided the only evidence for them.

The stoke-hole was probably on the eastern side and very likely just a little north of the offset on this wall; remains of a plaster facing were seen on the

edge of this wall suggesting the position of the flue. The flue taking heat through the west wall into Room ix was opposite this. There was nothing else to support this theory, but it is significant that from Period VIII, when the room was extended to the east (Room vi), evidence was found for a furnace room in this area. The remainder of the east wall of Rooms vii and viii was removed at the time of the extension.

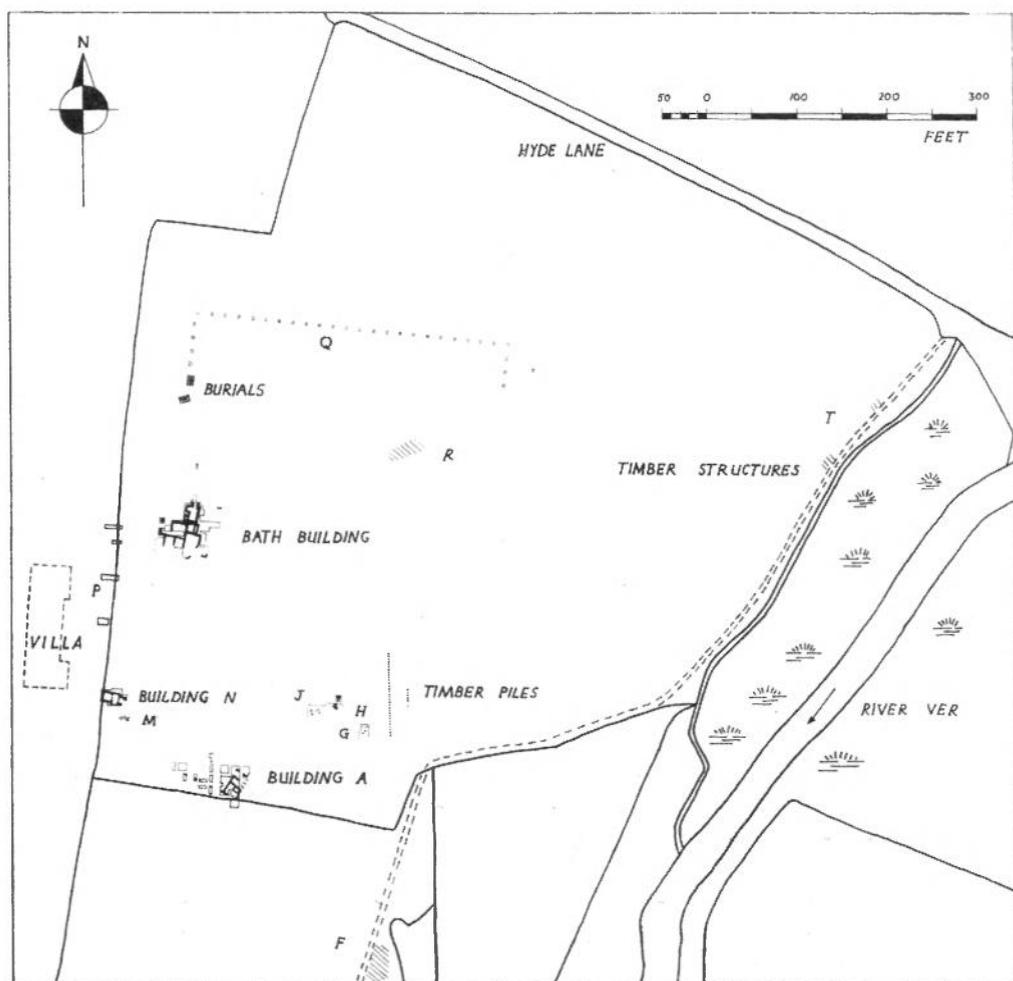


Fig. 2. Excavations at Park Street, 1954-7

The clay blocks dividing the two rooms were also faced with plaster and, to judge from the mortar still adhering, had probably supported tiles. One formed an offset from the west wall; this retained two of the tiles *in situ*. The rectangular block in the middle of the room measured 2 ft. by 1 ft. 6 ins. In Room viii were five rows of five *pilae*, but only four retained any of their tiles.

A thick layer of soot covered the floor, above which was the destruction layer consisting of flints, roofing materials, fragments of the upper floor and a few sherds of fourth-century coarse-ware.

### Room III

It seems possible that there was another room to the north of Room VIII belonging to Period VII, but this had been largely swallowed by the later enlargements and rebuilding. There was no straight joint in the west wall of Room VIII since it extended northwards to form the west wall of Room III. This is confirmed by the results of the analysis of the mortar bonding this wall, which significantly had the same type of composition as the other mortars belonging to Period VII. The structural history of Room III is very complicated but there is no further evidence to show if a room existed here at this early period, and certainly nothing to indicate its form.

### Room IX

This room was roughly oblong in shape with short sides of 8 ft. 2 ins. and long sides of 11 ft. 5 ins. and 10 ft. 11 ins., this last discrepancy being caused by the irregular shape of the north wall. The south and much of the east wall had been removed by gravel digging, but the surviving floor and a slight rim of the wall plaster were sufficient to produce a plan. Here, as in the rooms to the east, the flint wall courses were built on clay which was about 9 ins. or a foot above floor level (Fig. 4, section C-D). The walls were rendered throughout with a pink plaster.

The room was heated indirectly through a flue, 1 ft. 10 ins. wide, in the eastern wall, connecting it with Room VII and drawing upon the hot air that might exist there. It can be interpreted as the *tepidarium*. Remains of *pilae* existed on the western side of the room, two of them standing to a height of 1 ft. 9 ins. and 1 ft. 6 ins. respectively. Nothing of the upper floor remained intact. Amongst the building rubble filling the room were large quantities of flue tiles, one of which was decorated (Fig. 9, 3), part of a bone comb, a piece of window glass and sherds of indeterminate fourth-century ware. At the south end and extending for a third of the length of the room was a step 1 ft. 6 ins. high on which were the mortar traces of two rows of *pilae*. The reason for this raised floor level would appear to be a desire to reduce the temperature at this end of the room by limiting the quantity of hot air. Soot, in places 8 ins. thick, extended over the floor which consisted of *opus signinum*, about 3 ins. thick, founded on a layer of flints. A shallow pit almost in the centre of the room, containing a grey silt but no dating material, had caused a slight subsidence which had made the floor crack and slope towards the centre. On the east wall, the northern end had been offset by 2 ins., but there seemed to be no structural explanation for this.

### Room X

The floor level was nearly 2 ft. 6 ins. above that of Rooms VII, VIII, and IX as this room was unheated. It would have had the function of *apodyterium*

and *frigidarium*. Apart from the south side, the room was complete in plan, though ploughing had reduced the walls to a height little above floor level. Internally it measured 8 ft. by 12 ft. There were two entrances into the room, one in the east wall connecting with the upper floor of Room IX, and the other, an external doorway, 3 ft. 3 ins. wide, in the north-west corner. The west wall retained traces of pink plaster but none remained on the north or east walls. The room originally had a tessellated pavement, fragments of which remained in position, but over the great proportion of the area ploughing had displaced the tesserae leaving an irregular surface on the foundation of brick chippings and pink mortar. Over the floor were a few fourth-century pot sherds, a pair of bronze tweezers (Fig. 8, 2) a needle, and an illegible, but probably fourth-century, coin (no. 6). Along the edge of the west wall and also scattered over the floor and entrance were eleven small pieces of Purbeck marble which seemed to have belonged to a dado.

On the south side of the room were the remains of a cold water plunge bath, which had been almost entirely removed by gravel digging. Its bottom was 2 ft. 6 ins. below floor level, but it was impossible to obtain any idea of its shape and extent. Its construction had been similar to Rooms IX, VIII, and VII with the flint courses of the west wall stopping 9 ins. above the bottom, the clay being faced with tiles and pink plaster. The bottom of the bath was a layer of *opus signinum*, 7 ins. thick, resting on the natural clay. On the north side were 6 ins. of dirty clay with a thin layer of *opus signinum* on top, and there was a gap of 10 ins. between the edge of the bottom of the bath and the plastered northern wall. This and a spread of *opus signinum* with the vestiges of a row of three square tiles on the floor in the south-west corner of Room X, suggested that steps had led down into the bath at this point.

#### *Post-holes East of Rooms III and VI*

Pottery from the black soil filling of these post-holes and the small rubbish pit to the south was generally late second-century in date. Five post-holes were found; they were irregularly spaced, 9 ins. to 1 ft. in diameter, although they were generally more oval than circular. In most cases the edges of the holes were packed with small flints. To the south was a large pit, filled with black soil, with a number of flints round the south-east edge. The post-holes do not have a likely relationship with the uneven line of the Period VIII buildings. Allowing for the fact of a later addition to Rooms VII and VIII (Room VI), there may be a connection between the post-holes and the Period VII bath house. The presumed line of the eastern wall of Rooms VII and VIII is only 11 ft. from the post-holes and, with the possibility of another room to the north, there is a strong suggestion of a timber lean-to structure.

#### *Period VIII (Late third-century and early fourth-century A.D.): Rooms I, II, IIA, VI, XI*

The subsequent enlargements and additions to the original bath suite have all been included in this period, although they are not all of the same date. Again, there was an almost complete lack of stratified material on which dating could be suggested, but where pottery was found in a sealed layer, it

belonged to the fourth century. The results of the mortar analysis, however, offered a clear contrast with those from the earlier building, and a strong association with those of the Period VIII construction in the villa. For this reason, it seems excusable to assume a general date for the additions in the last years of the third century or the first part of the fourth century.<sup>1</sup> This corresponds with Mrs. O'Neil's suggestion of a period of rebuilding at about 300 A.D.

The building sequence within this general period can be seen spreading, for the most part northwards, in five phases. Rooms II and III present the most complicated history in the whole building, being represented in all five phases. Throughout the rooms the style of building had changed from that used in Period VII. Generally the walls were about 2 ft. thick, but there were a large number of irregularities, and wall thicknesses sometimes exceeded 3 ft. 6 ins. Flint was the commonest material but large numbers of tiles, many reused, were incorporated as courses, quoins or for facing. In colour the mortar used was a yellowish buff, and plaster renderings varied from pink to orange. Wall footings were of flints throughout, and flint foundation courses no longer rested on clay some inches above floor level.

#### Phase A: Room III

This was an addition, north of Room VIII in the original bath suite, and probably superseded an earlier room belonging to Period VII. The line of the earlier walls on the west and south was adapted, the latter being rebuilt. At first the room was lined with tiles and was approximately 7 ft. 6 ins. long and 6 ft. 3 ins. wide. The floor also was lined with tiles, to judge by the numerous tile fragments and the red staining of the dirty grey clay below (Fig. 4, section A-B). The considerable use of tiles, set in a pinkish mortar, and the depth of the room, nearly 2 ft. below the floor of Room I, perhaps suggest a bath. There were no signs of heating in this phase. Opposite one another on the west and east walls were two offsets. These were hard white mortar bases for tiles, nearly 1 ft. square, and they projected from 3 to 9 ins. into the room. Their purpose is unknown.

#### Room VI

This was an enlargement to the east of Room VIII, probably in this phase of Period VIII. Not only does the mortar employed compare with that of the later period, but the room was in use at the same time as Rooms VII and VIII which were shown to have been occupied well into the fourth century. The enlargement is most clearly noticeable in the slightly different colour of the *opus signinum* floor and the different alignment of four rows of four *pilae*, compared with those in Room VIII. The north wall had been rebuilt, but it broadened out at the point where the addition began. The large block of clay, the

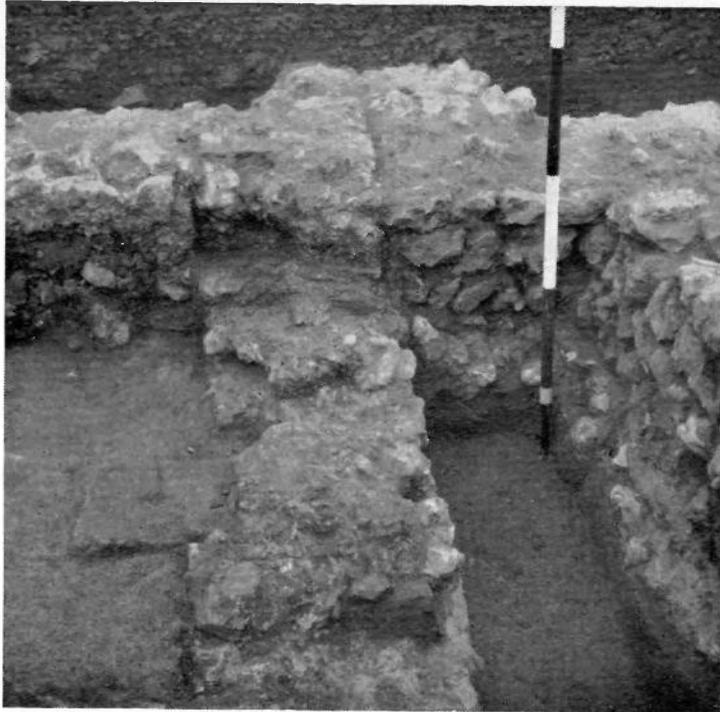
<sup>1</sup> The five recognizable building phases within this period have not been indicated on the plan (Fig. 3.). Their sequence is not certain in every case, and some portions of the building which have been considered together in one phase may not, in fact, have been contemporary. It was felt that appropriate hatching of the plan might be confusing and misleading, and that the development of the building history would be apparent in the text.



A. Bath building: S. side



B. Bath building: N. end



A. Bath building: Room III, addition to E.



B. Building A: Bath in Room X

counterpart of the smaller blocks on the west dividing Rooms VII and VIII, had its north-west corner chamfered to avoid the existing *pilae* of the older room.

Elsewhere, the remains were very fragmentary since the southern part was almost wholly removed by the gravel workings. The east wall extended 9 ft. before beginning to curve inwards, while on the outer face was an external angle with a wall running eastwards. The latter may have been part of a building of which an internal angle, formed by a south wall and its return on the east side, was found 9 ft. 3 ins. to the south. Within this conjectural building was a thick deposit of burnt clay and soot. It seems very likely that here, enclosed by flint walls, was the furnace-chamber for the hypocausts of Rooms VI, VII, VIII, and IX. In the soot covering the floor of Room VI was a piece of ironmaking slag. It has been suggested (see p. 130) that it found its way into the flues after the stoke-room had been converted into an ironmaking furnace.

#### Phase B: Room III

The function of this room changed in the second phase. The tiles on the floor were largely removed, and an *opus signinum* floor inserted with a layer of gravel and nearly 2 ins. of white mortar as a foundation. There must have been an upper floor, as deposits of soot in several places showed that the room had been heated. The heat came through a tile-lined flue midway in the north wall. The room was also enlarged to the east by nearly 2 ft. beyond the east wall. The latter was partially demolished, although a flue was constructed leading into the new addition. This flue contained a thick layer of soot. The added space had no lower floor, the gap between the walls being filled with large flints. The walls of the addition showed two different builds (Pl. VA). The lower courses were constructed with a greyish-white mortar, while the upper courses were roughly built with a yellowish-buff mortar. Despite the incongruity of the layers, the greyish-white mortar can hardly represent an earlier building period as the changes and reversals in the building's plan would be absurd, and this reasoning is confirmed on analysis. It can only mean a change in the materials while the wall was under construction. On the west side of Room III, was a rendering in brown plaster in front of the remains of the tile lining of the earlier phase. It was possible to see the manner in which the *opus signinum* floor had been laid down in strips east-west across the room, each strip being about 2 ft. in width.

#### Room I

It is likely that Room I belonged to this second phase as the north-east corner was masked by a wall belonging to Phase C. The room was formed by completing the two sides of the angle made by the Period VII walls of Rooms IX, X, VIII and III. The result was almost square with the sides varying in length from 13 ft. 3 ins. to 13 ft. 9 ins. It had been heated from a stoke-hole on the north with a tile-lined flue midway along the north wall. Remains of *pilae* were found within the room. They were set in a regular pattern, apart from a wider passage between the rows running north and south opposite the flue, and probably numbered sixty-four in all. Only along the sides of the walls

had any of the tiles survived in whole or in part, and it seemed that the *pilae* were removed before the collapse of the building since in one place, near the centre of the room, large fallen flints had embedded themselves in the floor overlying the mortar impressions left by the tiles. As opposed to the great depth of soot in Rooms VII, and IX, there was little indication of heat having been used except for some scorching of the floor by the flue and burnt materials within the flue itself. In the flue a large *tegula* lay horizontally with burnt clay on top of it and, below, more burnt clay and soot together with ten complete nails and twenty-three lumps of iron which seem to have been parts of nails. The great number of nails under the tile suggests the burning of old used timbers. The deposit of burnt clay above the tile, which was below floor level, does not occur elsewhere in the rooms, which would indicate that both tile and timbers do not belong to the destruction level but are possibly associated with the raising of the floor within the flue. Outside the room, on the north side of the flue, the furnace pit was found cut into the natural clay. To the east and west were soot-filled gullies sloping downwards to the entrance of the flue. It was noticeable that the eastern gully had destroyed part of the south west corner of the footings trench of the annex of Room II, thus suggesting a late date or a remodelling of the stoke-hole. In the black soil of the stoke-hole the base of a pot in roughly-made fourth-century ware was found, as well as a few second-century sherds.

The floor of Room I consisted of a 2 in. layer of *opus signinum* with a foundation of brown gravel, about the same thickness, resting on the natural clay (Fig. 4, section A-B). The floor was badly damaged in several places and the south-west corner had collapsed into a large hole caused by a burrowing animal. The walls were lined with an orange rendering, and a similar mortar was used for the *pilae*. In the north-east corner earth filling a robber's trench contained eighteenth-century or early nineteenth-century pottery. In a pocket of grey clay under the floor against the east wall was a second-century sherd associated with the building of the east wall, which has already been shown to belong to Period VII.

#### Phase C: Room II

This is an addition to the north of Room III. At first it measured 7 ft. by 6 ft. 4 ins. internally, and was therefore similar in size to Room III. It also shared the same heating system. Its construction was extremely clumsy. A wall on the south, 2 ft. 2 ins. wide, was built against the north wall of Room III and its eastern annex. The new wall overlapped the straight joint caused by the enlargement and, at the west end, it narrowed to allow for the substantial brick quoin of the north wall of the earlier room. A tile-lined flue 1 ft. 6 ins. wide, with the cheeks built with courses of tiles, matched that in the contiguous wall. The east wall was of massive build, the footings being almost 4 ft. at their widest, although tapering on the south to meet the end of the south wall; it continued for 8 ft. beyond the north wall, though the reason for this is not clear. There is no other indication of a room to the north at this stage, and the continuation may have marked one side of a furnace chamber. Little

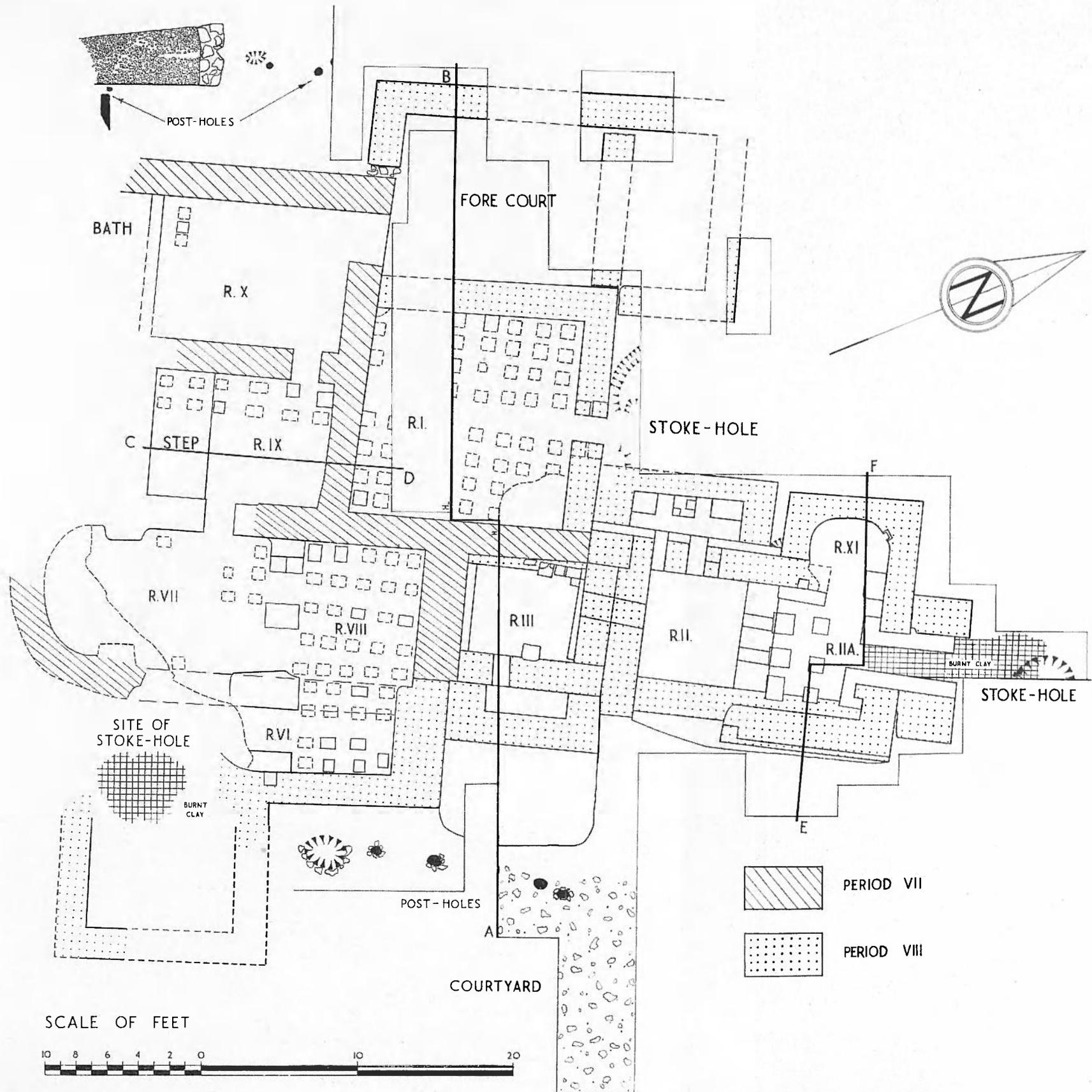


Fig. 3. Bath Building (for Sections see Fig. 4)



remained of the north wall itself, which had been demolished to its lowest footings; the most distinctive feature was another tile-lined flue, 1 ft 4 ins. wide, at a lower level than the flue in the south wall and 6 ins. below floor level. The west wall also projected slightly beyond the north wall. It was similar to the east in having foundations much wider than the wall itself. This was an unusual feature in the building as a whole, and here produced an external offset 8 ins. wide. The south end of this wall overlapped the straight joint made by the addition of Room I to the west wall of Room III during Phase B. It had been much robbed, but two flues of unequal width, and leading westwards, remained. The floor had been tiled through the centre of the room with rubble and mortar at the sides; below were flints in a hard white mortar and below that a layer of chalk and more flints in a dirty brown clay. Above an internal offset of the east wall was some reddish mortar, possibly the remains of a rendering of the walls. Apart from the flues and the tiled central channel, soot and burnt clay also indicated its use as a heated room. The floor above had been of *opus signinum*, possibly supporting a mosaic; red, blue, orange and white tesserae were found in the destruction layer. Fourth-century pot sherds were at the bottom of this layer, just above lower floor. The destruction layer itself was unlike that elsewhere in the bath building. There was much dirty clay mixed with wall plaster and *opus signinum*, and between this and the usual building rubble was a large deposit of soot and burnt material, suggesting the use of clay in the construction of the upper part of the walls and the destruction of the room by fire.

#### Phase D: Room II

At some time when Room II was still heated, it was enlarged towards the west in much the same way as Room III had been extended to the east. Hot air passed through the two flues in the west wall into a very narrow addition with the bases for three *pilae* arranged along the new west wall. Soot was found on the mortar floor which overlay orange clay without foundations. The extension had only a limited life, going out of use in the next phase. It was demolished so that only the line of mortar and a few flints remained, and its south-west corner was partially removed while the stoke-hole of Room I was in use.

#### Phase E: Rooms II and III

This was the final and in some ways the most drastic of the phases of reconstruction during Period VIII. Before describing the further additions to the north of the building, it will be more convenient to describe the change of use of the older rooms. It is impossible to discover any alterations in the original bath suite although these may have occurred; it is mainly in Rooms II and III that they are found. As has been suggested above, there is a suspicion that there may have been a fire in Room II resulting in the need for reconstruction. The chief change was that the two rooms were no longer heated. In Room II the space between the two floors was allowed to be filled with rubble and,

although the north wall was demolished, the filling of the room provided a barrier preventing loss of heat in the new room to the north. Similarly in Room III the space between the floors was packed with large flints and rubble, hardly distinguishable from the rubble of the destruction layer above; a new blocking wall of a very poor flint construction was inserted on the foundations of the old north wall of Room III, completely blocking the flue connecting the two rooms. It would appear that the Phase D annex to Room II was demolished at the same time.

*Rooms IIA and XI* (Fig. 4, section E-F; Pl. IVB)

The replacements for the heated chambers of Rooms II and III were added to the north, and were probably the last pieces of construction in the bath suite. In part, the walls were built on the footings belonging to Phase C in Room II. The later masonry on the east wall was 2 ft. 6 ins. thick, with its outer edge faced with reused tiles and its inner face set back, leaving an offset just over 1 ft. wide. This offset had been rendered with pink plaster. On the west was an apsidal extension (XI), with a rectangular external plan. The apse was probably for a hot water basin and was divided from IIA, which must have served as a *caldarium*, by two blocks of hard white mortar against the north and south walls, on a rough line with the west wall of Room II. They appear to have been the bases for a tile construction. Hot air had passed through the gap between them, which was 2 ft. 3 ins. wide, and about 3 ins. of soot had been deposited on the floor. The floor of the apse, sloping towards the centre, was cobbled with lumps of chalk, and had a foundation of large flints set to an uneven depth in the undisturbed natural clay. Between the mortar blocks the floor was slightly raised by a spread of yellowish mortar. There were indications that the room above had some pretensions, for in the destruction debris were numerous pieces of *opus signinum* with many coarse red tesserae and fragments of red painted wall plaster associated with fourth-century pottery. Set in the north-west curve of the apse was a flue constructed out of a box tile, open on its south side to collect hot air for giving additional heat to the room above. A small pit under the junction of the projecting apse wall and the west wall of Room II, ante-dating both structures, was partially excavated. It produced in its black soil filling two sherds, which suggest a late third or early fourth-century date, as well as a fragment of glass and a small piece of Purbeck marble.

Midway along the north wall of Room IIA was the flue leading from the stoke-hole, 7 ft. outside the building. The furnace pit was sunk to a level 3 ins. below floor level within the room. Its site was marked by an area of burnt clay, 2 ft. long, with a much more extensive deposit of soot and tiles above it. The hot air was led into the room through a flue, 6 ft. long, which tapered to a width of 1 ft. 7 ins. and was lined on both sides with 11 in. square tiles. Built against the north wall of Room IIA, providing a backing for the tile-lined flue, were oblong cheeks of flint masonry which possibly served as the stand for a boiler. By these means a substantial draught must have been provided. The flue was floored mainly with chalk, but where it passed through the thickness of the wall tiles were used. These, as well as the tiled wall, had suffered considerably

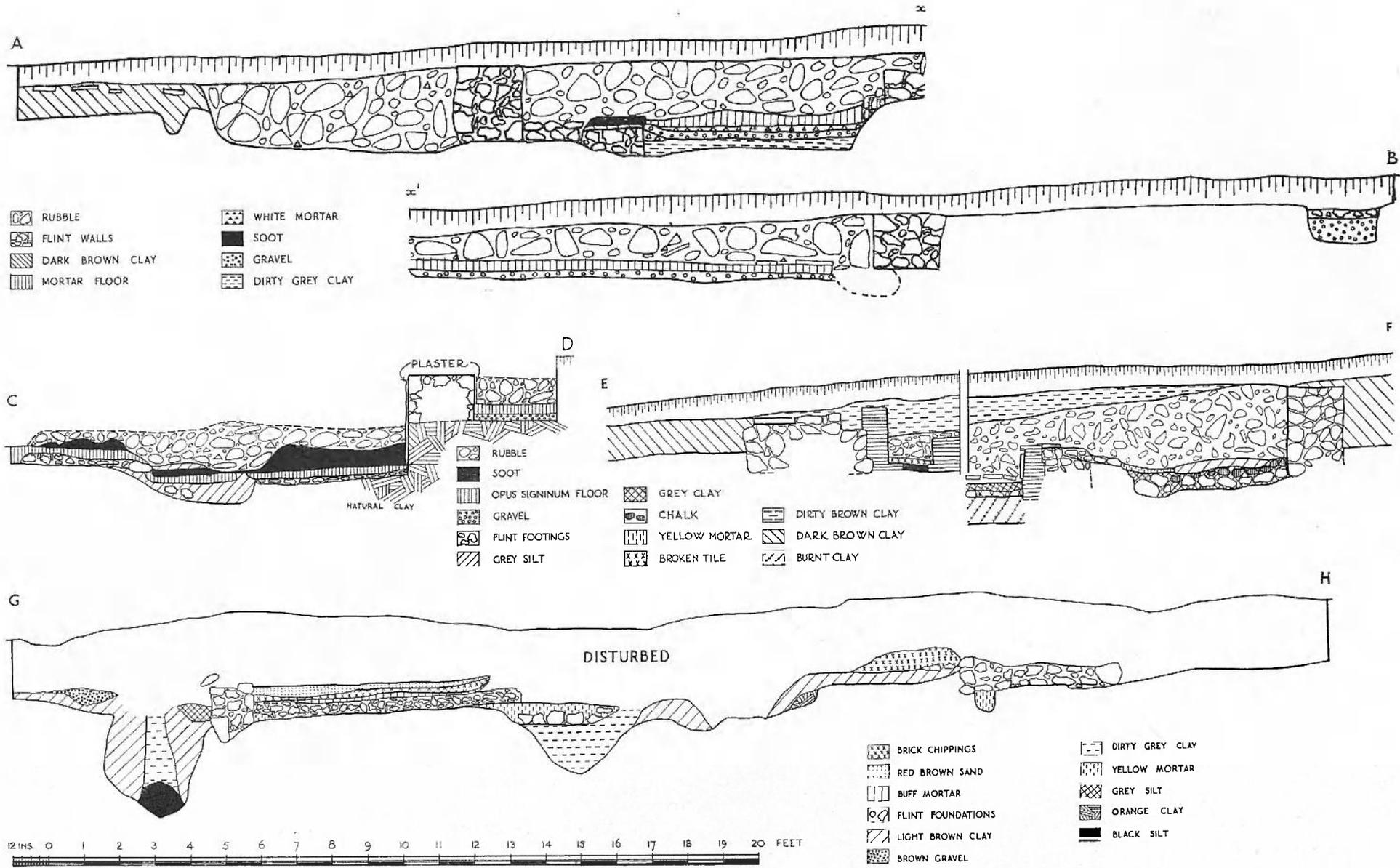


Fig. 4. Bath Building, Sections A-B, C-D, E-F (see Fig. 3)  
 Building A, Section G-H (see Fig. 5)



through the heat used. Between the walls the accumulation of fallen tiles was so great that the flue may have been corbelled over or vaulted, but evidence of any springing had been destroyed. The floor of the room was clay, burnt to a varying depth. Soot and broken tiles lay on it. Tiles, fresh and reused, had been employed to a great extent, lining the interior of the north wall on either side of the flue and continuing along part of the west wall. Six crudely made *pilae* stood 1 ft. 6 ins. to 2 ft. high in the southern half of the room. All sizes of tiles had been used including, in one instance, a box-flue tile filled with clay. Along the east side they were built against and over the offset of the earlier footings, and the lowest tiles of the three most southerly *pilae* overlapped the footings of the then disused north wall of Room II. A line of soot lay along the outer edge of the old wall indicating the limit of the hypocaust system on this side. As in Room XI, there was a layer of dirty brown clay just above the floor which seems to have been derived from the clay walls or partitions of the rooms above. In the destruction debris was painted wall plaster of varying colours in a striped pattern, together with numbers of crudely made tesserae. Near the stoke-hole flue was an implement of stag's horn (p. 127; Fig. 9).

Sealed by the soot and burnt clay from the stoke-hole was a large pit full of dirty grey clay. Although producing practically no pot sherds, it did yield a bronze coin of Cunobelin (No. 2), and so may have been open during the first century.

#### FORE COURT

West of Room I were the scanty remains of a large rectangular structure, measuring roughly 20 ft. by 10 ft. internally. Very little survived, at the most one course of flint on gravel footings, with no floors and very little building rubble in the upper layers. It does not seem to have been an inhabited portion of the building and, as the former external entrance of Room X opened into it, it probably served as a covered forecourt or vestibule. That it lies on the villa side of the bath building lends support to this theory. It was evidently a late building since the walls are straight-jointed with those of Rooms X and I, and it falls into Period VIII on mortar analysis. Later still a cross wall on the line of the north wall of Room I divided it into two unequal parts.

South of this building, evidence of timber structures was found but time was not available to examine these completely. Possibly associated with three post-holes, of approximately 5 ins. diameter, was a tapering straight-sided mass of packed chalk with mortared flint at its north end. The southern end had been destroyed by the gravel working. At right angles to the packed chalk was a long slot for a timber beam, 7 ins. wide. The eastern end of this had also been destroyed. With the evidence available it was impossible to put forward a convincing explanation for these features.

#### COURTYARD

East of Room III an area of rough flint and broken tile flooring was examined. It resembled an uneven yard floor and was generally featureless,

apart from the post-holes already mentioned (p. 105). Below the floor was a layer of brown soil containing rubbish including a number of first and second-century pot sherds, and above the floor was a spread of black soil and rubbish which included pieces of a Castor-ware beaker.

Against the east wall of Room III was a mass of rubble which appeared to be due to the eventual collapse of the building. The ground had been dug to a depth of between 1 ft. and 1 ft. 6 ins. at the time of the construction of the extension to Room III, the walls of which had been built freestanding. The excavations were later filled with mortar and building debris which became a solid mass. Above it the outer face of the wall was rendered with a plaster consisting mainly of finely crushed brick.

#### BUILDING A (Fig. 5)

The building on the extreme south of the main area explored is simply labelled 'A' since its function is far from clear. It was the first site to be investigated in 1954. It had been much disturbed, and its eastern corner largely destroyed in gravel digging, but it appeared to have been a rectangular structure, divided into three unequal-sized rooms, with wings stretching to the N.W. formed by verandahs or lean-to's, culminating in a rough courtyard floor similar to that east of the bath building. The general alignment was the same as that of the bath building, that is, its axis was approximately north-east to south-west. It faced the villa, which was at least 210 ft. to the north-west.

The walls, where they survived, were trench-built in flint with some use of tile courses. Analysis of the whitish-buff mortar used showed affinities with the mortar of Period VIII in the villa's chronology. The walls varied in thickness from 1 ft. 6 ins. to 2 ft. The whole building was roughly 30 ft. long and 16 ft. wide, but it was very irregular. There were at least three phases of occupation on the site. The first probably belonged to the middle of the first century A.D. and the second to the late first or early second century, apparently contemporary with Period VI. The third, as was shown from the mortars, was due to the large scale construction undertaken in the late third and early fourth centuries, Period VIII.

#### Phase A

This was represented by two gullies, one running roughly east-west under Room I and the other more inclined north-west to south-east, slightly to the north of Room II. Both were filled with a dirty yellow-grey clay which produced a number of sherds of Belgic style, but also a few of Roman fabric, putting the general date well into the middle of the first century A.D. The gully under Room I was an even-sided, almost V-shaped ditch and was regular in direction. It was 3 ft. wide and averaged 2 ft. 6 ins. deep.

The gully north of Room II was less regular and was deep in places where pits had been dug for posts; it was clearly intended for a fence or palisade. At its widest it was rather more than 3 ft. across. The filling was more mixed than in the other gully, containing a brownish clay, and at the bottom was black

silt. Within the filling it was possible to see the traces left by the insertion of a wooden post which had probably been removed quite soon after the construction of the fence, leaving a hole which became filled with dirty grey clay (Fig. 4, section G-H). Another pit dug for the erection of a post was found 8 ft. away to the west, and between them the gully was shallow and narrower.

#### Phase B: *Period VI*

Sealing the gully in Room 1 was the remains of a mortar floor embedded in which was a coin of Tasciovanus (No. 1). The floor only existed in the northern corner of the room where there had been relatively little disturbance, but enough remained to associate it with the southern walls which were of earlier construction than those on the north. A layer of greasy brown soil above this floor contained a few sherds of second-century form. Almost nothing of the masonry courses of the southern walls existed but it was apparent that they were built on clay standing about 1 ft. above floor level, similar indeed to the type of construction used in the hypocausts of the Period VII bath building. On top of the clay was a layer of brick chippings of varying thickness, compacted to give some foundation. The light brown clay under the brick chippings contained scraps of pottery, some Belgic in style but with others suggesting a date nearer the end of the first century or even the beginning of the second century. Most of the pottery found within this room was of a second-century date but none could be closely associated with the structure. Apart from this fragment of wall there were no other features suggesting the limits of the early building although it is possible that the later walls on the north side were built on a former line.

#### Phase C: *Period VIII*

It was in this phase that the building took its final form, with a room on either side of the earlier structure. The function of this enlarged building was not clear although, from some of the building debris remaining in the rooms, a domestic use can be suggested. It might have served as a small bath house or dwelling house.

#### *Room 1*

This was the middle room of the three, above the remnants of the two earlier phases. The N.W. wall had been built on to the clay of the earlier construction and the final wall was almost equally divided between the two styles. Part of the N.E. wall also survived but its east end had been almost totally removed. Internally the room measured 5 ft. 9 ins. wide, and it was possibly 13 ft. long. Most of the southern part of the room had been disturbed by burials of animals, a late fifteenth-century groat of Henry VII (No. 7) was found in the vicinity, and more recent disturbance had removed most of the upper levels on the eastern side. Only in the northern corner had anything of the interior remained, and there, above a layer of greasy brown clay overlying the earlier floor, were the remains of another mortar floor. Above this was a

destruction layer containing mortar and building rubble together with dark red and yellow-buff painted wall plaster and fragments of window glass.

#### *Room II*

Very few features remained, and the whole of the interior of the room had been removed by the mechanical grab and souvenir hunters. Much the same shape as Room I, it measured 7 ft. by 13 to 14 ft. The floor was of well-laid tiles, some bearing cat and dog foot impressions, on a foundation of brick chippings and buff mortar on top of flints. The walls were of unequal thickness, and the N.W. wall only existed as a curtailed return of the N.E. wall. The tiled floor extended over the line of the outer face of the wall. North-west of the edge of this floor was a shallow depression running almost the length of the room, 2 ft. 6 ins. wide and 9 ins. deep below the floor level. This was full of soot and also contained second-century sherds, a piece of tile scored into squares from which rough cubes had been cut, presumably for tesserae, and a fragment of relief-patterned tile (Fig. 9, 2). Nothing remained on the surface of the floor so that it is almost impossible to guess the function of the room. The burnt material on the N.W. side and the gap in the N.W. wall, however, suggest a stoke-hole for a hypocaust.

#### *Room x*

This was more square in shape with sides of roughly 11 ft. 9 ins. Little remained of the walls apart from the N.W. which was straight-jointed with the clay and brick-chip wall of Room I, and was not bonded into the S.W. wall. Both of these were very roughly constructed with no attempt at coursing the flints. Nothing remained of any floor but in the eastern corner was a small bath or tank (Pl. VB).

Whatever its title, the latter was certainly intended for holding water. Internally it measured 3 ft. 3 ins. by 3 ft. 8 ins. and was 1 ft. 1 in. deep, with a concrete floor 6 ins. thick and rendered walls. The floor was set on a foundation of flints and chalk, with a thin layer of dirty grey clay between it and the natural clay. The walls themselves were of varying thickness with reused and broken tiles used for the inner face on two sides, and flint on the outside. The N.W. wall was nearly four times as thick as the S.E. and stepped down 7 ins. from the inner face. An overflow drain in the southern corner, constructed of imbrex tiles and sunk through the concrete floor, was 1 ft. 3 ins. deep.

The bath was later partially filled by a thick layer of pitched tiles, flints and loose brick chips, and above was a rough floor of white mortar 1 in. thick. This floor was about 4 ins. below the top of the first step. The walls had been rendered afresh with a pinkish plaster and two very large tiles had been set on end against the N.W. face (see p. 132). The reasons for the change from its original purpose of holding water were not apparent and there were no datable finds within the filling.

#### *Courtyard*

The S.W. wall of Room x continued westwards, and was traced for more than 50 ft. During later gravel digging a parallel wall to the N.E. was observed.

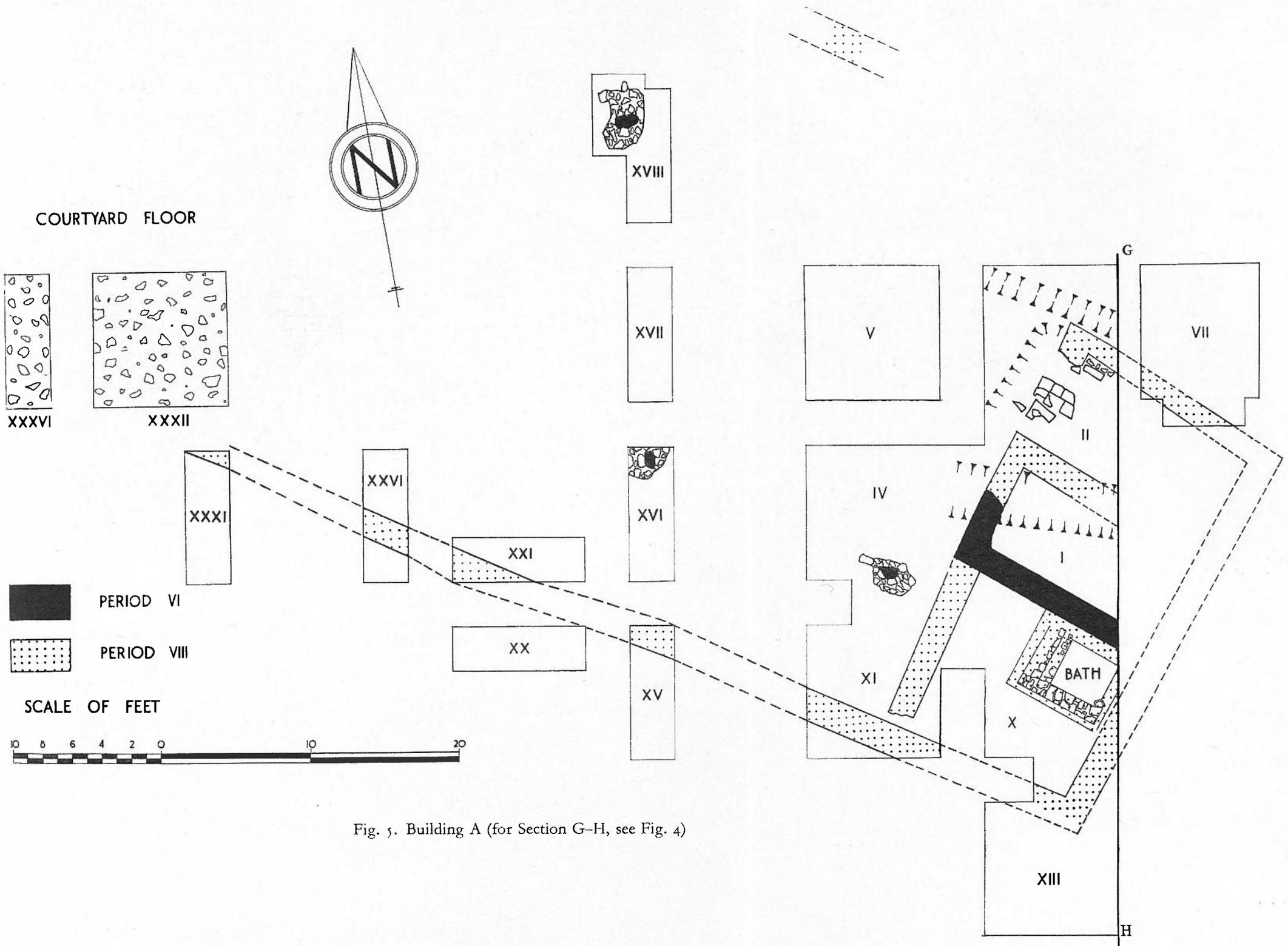
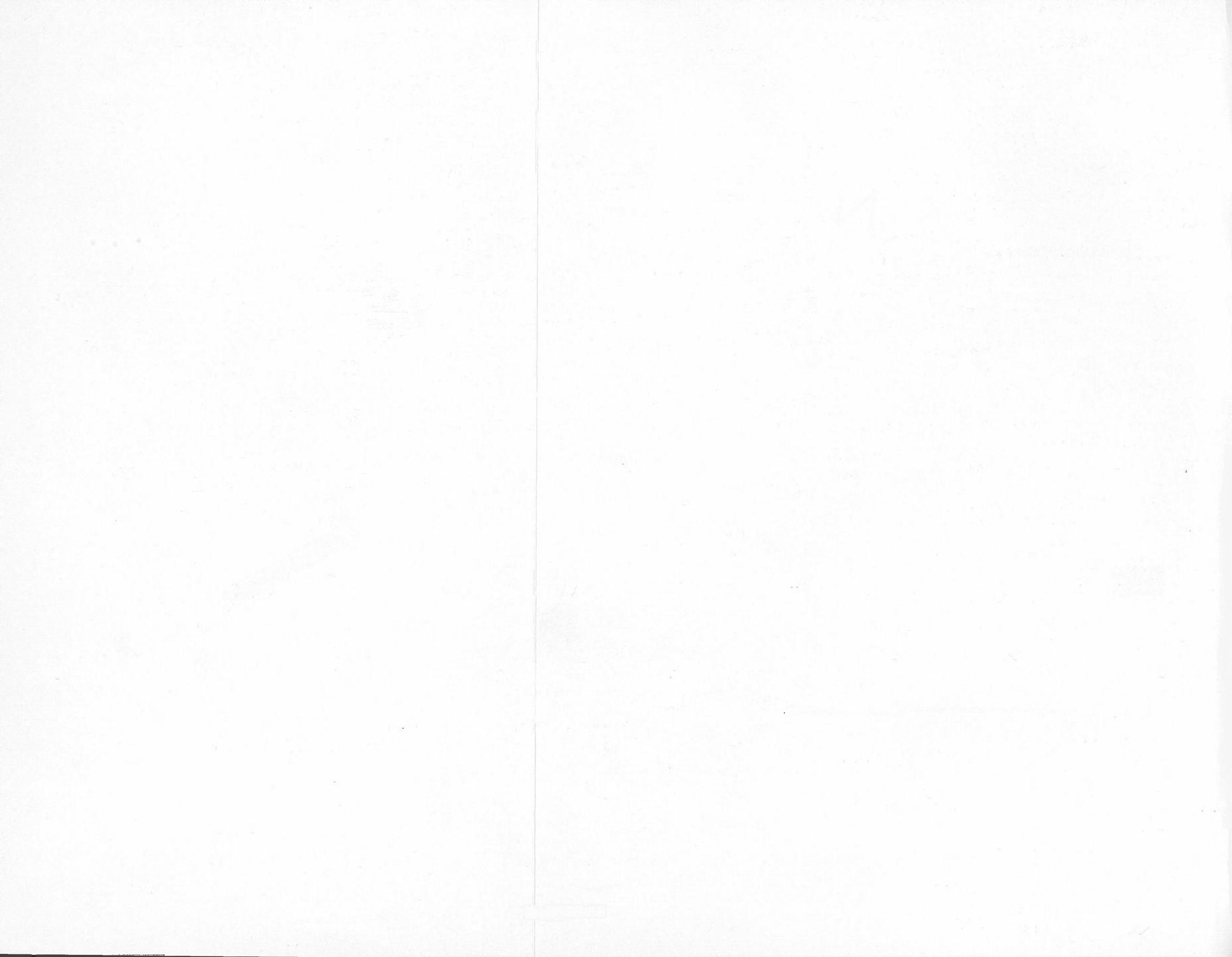


Fig. 5. Building A (for Section G-H, see Fig. 4)



Between 9 and 10 ft. from the south wall, two post-holes were found and there was another at the same interval from the north wall. Large roughly oval-shaped pits had been dug and the posts, about 6 to 9 ins. in diameter, had then been packed around with flints. It was not possible to discover how close the posts were set or how far they extended to the N.W. They indicated some form of lean-to structure.

Nothing remained of the courtyard floor, if such existed, near the building, but one was found 51 ft. to the N.W. which extended for at least a further 15 ft. This floor was roughly cobbled with flints and broken tiles, and in the brown clay above it were a large number of late third-century and probably early fourth-century pot sherds. From here a piece of what appears to be copper slag was found (p. 130) and it is possible that copper smelting had taken place nearby. Below the floor in trench xxxvi was a small rubbish pit full of dirty grey-black soil containing pieces of broken tile and pottery of third-century date, but also with a high proportion of second-century forms.

#### BUILDING N (Fig. 6)

About 45 ft. south-east of Room xv of the villa was a roughly oblong building which retained traces of a hypocaust. Its maximum internal measurements were 20 ft. by 10 ft. 9 ins. and at the west end the wall still stood to a height of nearly 3 ft. (Pl. VIA). The walling was of reasonably good quality with tile bonding-courses and quoins frequently used. Its thickness varied between 2 ft. 3 ins. and 1 ft. 4 ins. The uneven exterior of much of the walling indicated that it had been trench-built into the natural gravel and clay. The mortar used was orange in colour and seemed on analysis to be associated with Period VI, late first-century to mid second-century A.D., rather than Period VII. Apart from the west end which had been protected by the line of the hedge, very little remained of the structure apart from two or three courses of wall above the lower floor. It was more denuded towards the east end where the ground slopes towards the river.

A stoke-hole had existed at the extreme east end and the flue was flanked by rectangular flint cheeks, only one of which survived, though the other can be safely assumed. The quantity of soot and burnt clay at this point and the severe scorching of the floor provided conclusive evidence for the existence of a stoke-hole here. The hypocaust floor was divided into three unequal compartments and it is likely that the upper part of the building also corresponded to this plan. Not even mortar traces of *pilae* remained on the floor at the east end, and only at the west end were the remains definite. Here some of the *pilae* stood to a height of 9 ins. and the walls were rendered internally with an orange mortar. The walls generally seemed to belong to one period of building, the only discrepancy being on the main south wall, which stopped 6 ft. short of the W. end. The westernmost compartment was made almost 3 ft. narrower by a fresh alignment of the south wall, and the two parallel walls which resulted were connected by a short eastern wall. As the south wall was parallel to the north wall, and all the other walls are of the same build, this discrepancy may have been due to a change of plan and was probably not caused by later

rebuilding. In the angle of the north wall and the narrowing of the building towards the east end was a small 11 in. square cutting through the mortar floor, 17 ins. deep. This suggested a drain, similar to that in the bath of Building A. Among the rubble filling the building was some wall plaster and a large number of box-flue tiles. An iron cramp, or possibly a soot scraper was found within the building near the stoke-hole (Fig. 8, 7). There was a complete absence of pottery and only a few miscellaneous animal bones and iron nails. It is difficult to explain why this small, simple and quite detached structure should have been heated and constructed so close to the villa. With no significant finds it is not possible to give further support to the date suggested by the mortar analysis and there is little to explain its original function.

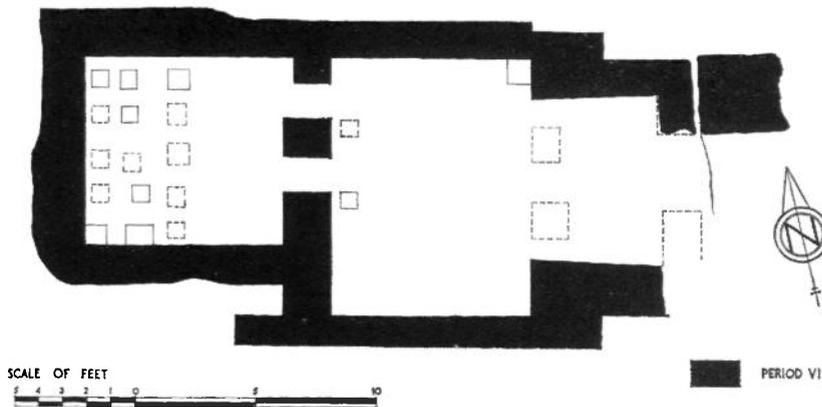


Fig. 6. Plan of Building N

#### SITE M

About 12 ft. south of Building N a rubbish pit, containing second-century A.D. pottery and food bones, was found by Dr. Ingoldby in the side of the gravel working. The pit was about 9 ft. deep and nearly 4 ft. across at the point where it could be examined.

#### SITE G

This was about 320 ft. east of the villa and close to an old course of the River Ver. The area cleared was mainly a rough, flint-cobbled floor with the fragmentary remains of rough flint wall footings at the southern edge. Above the floor were several sherds of second-century A.D. date. Between the floor and the natural clay was a layer of black soil containing numerous fragments of mid to late first-century A.D. wares, generally Belgic in type (Fig. 7, 13 and 14) but including a sherd of typical Antonine Samian<sup>1</sup> and a plain bronze ring (p. 128; Fig. 8).

<sup>1</sup> Information from B. R. Hartley, F.S.A.

## SITES H AND J

These, 35 ft. north-west of site G, are really parts of the same complex, and very similar in form. Rough wall footings of flint, of very crude and uneven construction, were found in site H. Too small an area was cleared to obtain any plan, although traces of return walls were observed. Below the wall was a pit filled with a soft grey clay from which came two flakes of worked flint similar to those found in the villa<sup>1</sup> (p. 124).

There was little in the way of a floor surface apart from sporadic scatters of broken tile, but 14 ft. west of the wall was an area covered with a thick deposit of broken tiles. This did not have the appearance of an intentional floor but rather of heaps of waste materials. A cutting was made through the tile deposit which showed a layer of black soil similar to that under the floor of site G and containing sherds with Belgic affinities but probably mid to late first-century A.D.

## SITE P

Following the removal of the hedge north of Building N, the quantities of flints below the topsoil suggested the existence of structures and four trenches were cut to test this. A wide and irregular length of loose flints and broken tiles was found roughly on the line of the hedge. This seemed most unlikely to have represented wall footings but was rather an area of rubbish thrown against the hedge after agricultural operations.

Close to the area of rubble were patches of black earth, mixed with gravel, which contained two fourth-century coins (Nos. 3, 5) and quantities of sherds of the same date. Two fragments of iron collars for connecting wooden piping were also found in this area (Fig. 8, 5).

## SITE R

With the progress of the gravel working northwards another area of occupation, about 230 ft. north-east of the bath building, was observed when the topsoil was removed. No structural features were seen but a large quantity of early first-century A.D. pottery (Fig. 7, 1-8) was found in a layer of dark brown soil 18 ins. thick above the natural gravel.

## BURIALS AND SITE Q

About 110 ft. north of the bath building, two elaborate burials were discovered during gravel digging in April, 1955. The coffins and their contents were rescued by Mr. John Lunn, then Director of Verulamium Museum.<sup>2</sup>

The southern tomb (Pl. VI B) was aligned north-east to south-west. The body of a man with the head to the north-east had been placed in a lead-lined stone coffin. A long glass bottle and fragments of another were found with the body and have been dated to about 300 A.D.<sup>3</sup> The sarcophagus was

<sup>1</sup> H. E. O'Neil, 63, fig. 7.

<sup>2</sup> A detailed report on this discovery together with the skeletal material and glass objects will be published separately by Mr. J. Lunn.

<sup>3</sup> Information from Dr. D. B. Harden.

7 ft. 3 ins. long, 2 ft. 4 ins. wide at the head and 2 ft. 2 ins. at the foot. It was formed from a single block of stone which had been smoothly dressed; the lid was also of one stone. Four cramp holes were visible on the outside. Enclosing the sarcophagus were the remains of a flint wall about 18 ins. thick and standing 18 ins. away from the sarcophagus. Only the footings of this wall survived, but they appeared to be part of a rectangular burial vault.

Six feet to the north was the second tomb. It was closely similar in size and form to the other, but it was aligned north and south. The body of a woman had its head to the south and buried with it were two silver pins. This sarcophagus was slightly smaller than the other, 6 ft. 4 ins. long, 2 ft. 4 ins. wide at the head and 2 ft. 3 ins. at the feet. It also was made from one solid block of limestone. The exterior was roughly dressed with diagonal tooling. The enclosing wall was rendered internally.

Partly to search for further burials and partly to examine a wider area on the north of the field, the Watford Archaeological Society under the direction of Mr. Peter Curnow excavated a series of trial trenches north of the burials. Nothing of significance was found in this area (site Q).

#### RIVERSIDE STRUCTURES AND SITES T AND F

Twenty-five feet east of Site G, gravel digging revealed a timber construction along what may be an old course of the River Ver. A double row of oak<sup>1</sup> piles was found on the west side of an extensive deposit of black river silt filling a depression in the gravel which marked an early water-course. Roughly squared posts, pointed at one end, had been driven about 2 ft. into the natural gravel every 4 ft. to 4 ft. 6 ins. Thirty-one such piles were recorded in the western row and seven in the parallel eastern row, the two rows being 20 ft. apart. Between them the gravel had a level surface over which in one place beams, and in two areas thin oak boards, had been laid horizontally. They were generally laid directly on the gravel but in one instance a tile had been placed beneath the boards. Elsewhere between the posts were large flints and much tile, some of it having been used previously for building. On average, the piles themselves were about 6 ins. square in section.

It is most unlikely that the Ver was ever wide enough to require a revetment 20 ft. wide on its banks, and the double row of piles suggests some form of wharf on the river side. There was no definite evidence for dating this feature, but the number of Roman tiles seems to indicate a Romano-British date. Its proximity to the villa also suggests a connection and a reason for its construction. In the silt near the piles were two rims of first-century A.D. storage jars (Fig. 7, 9) and the bones of an ox, which show that this water-course was in existence in Roman times.

#### *Site T*

Roughly 550 ft. north-east of the rows of piles, closer to the present course of the Ver, other timber structures were observed by Dr. Ingoldby during 1956,

<sup>1</sup> Identified by L. Biek, Ancient Monuments Laboratory, Ministry of Works.



A. Building N,  
from N.E.

B. Male burial in lead-lined  
stone coffin

*(Reproduced by permission of the  
Verulamium museum)*





in the side of the gravel pit. They appeared to the finder to be two sections of a trough for an aquaduct laid end to end. In section each trough measured 1 ft. 4 ins. wide with the sides  $\frac{1}{2}$  in. thick and 11 ins. high, bent slightly inwards; the base was  $1\frac{3}{4}$  ins. thick. Only about 8 ft. of the aquaduct could be traced. Close to one side was a post,  $3\frac{1}{2}$  ins. square, driven into the gravel. The previous year another post with a cross piece of timber was seen at this spot but was subsequently washed out of the side of the gravel pit by weather action. The section of trough which was removed appeared to rest on a specially prepared bed of fine gravel. Over the aquaduct was 6 ins. of clay and black river silt sealed from the top soil and brown loam 1 ft. 4 ins. thick by 8 ins. of alluvial gravel.

Scattered near the aquaduct were scraps of pottery of a general second-century A.D. date. About 20 ft. to the north were indications of more occupation material, tiles, pottery and some metal objects of about the same date. This was recovered from the dumps left by the gravel diggers and could not be associated with any structure.

#### *Site F*

In 1957 Dr. Ingoldby found further traces of occupation about 240 ft. south-east of Building A, following the widening of a stream beside the footpath. Several years earlier a quern fragment had been found in the area and examination of the bank of the stream produced roofing and flue tiles as well as animal bones and a little Romano-British pottery. No structures could be associated with these finds, and an area of flint floor appeared to be of comparatively recent date.

### SUMMARY AND DISCUSSION

It is unfortunate that the examination of the area immediately adjacent to the Park Street villa could only be carried out in a piecemeal manner. It was restricted by the conditions of a rescue excavation and largely consisted of the recording of the substantial masonry structures which were encountered by the gravel diggers. By the time these buildings were discovered it was too late for systematic testing of the area and it was not possible to do more than watch the destruction of the remaining portion of the field. The site had not attracted aerial reconnaissance. Sufficient material was obtained from the land between the villa and the River Ver to show that the site was one of considerable complexity, but without a complete picture it is impossible to reconstruct the organization and economy of the villa or even to do more than guess at the functions of the buildings which were found.

As is the case with most of the villas discovered in the region round Verulamium, Park Street is situated close to a river.<sup>1</sup> The Ver, and Watling Street immediately to the east of the river, must have formed the eastern boundary of the settlement. There is no record of structures being found west of the house, and the scatter of occupation between it and the river seems to suggest that the main working area lay to the east. No boundary ditches or

<sup>1</sup> Ordnance Survey Map of Roman Britain, 3rd ed.

post-holes of palisades were found, which could have suggested the limits of the farm; the mid first-century palisade trench which crossed the site of Building A was roughly at right angles to the house but is insufficient to base any conclusions upon. The two burials north of the bath house perhaps indicate an area separated from the daily life of the building and yards to the south, but further than this it is difficult to go.

In support of the evidence found in the 1943 excavations, the finds from the river bank indicated settlement going back beyond the Roman Conquest. The probably Levallois flake from a pit in Site H is the earliest artifact found in the area but does not, of course, imply settlement. Apart from the shallow oval pit containing a sherd of a food vessel, found in 1943, there is no definite evidence for occupation of the area until the Iron Age, particularly the Belgic period. Pottery of Belgic style, although not necessarily pre-Roman, was widespread. Nothing remained to indicate another house site, but the quantity of Belgic pottery and domestic rubbish at Site R suggested one not far away. Coins of Tasciovanus and Cunobelin were recovered, the latter from a pit north of the bath building. It is certain that the land between the villa and the river was actively used and settled at the same time as the Belgic huts were occupying the site of the later Roman stone house. The scatter of pottery and tiles extended for at least 300 yds. along the river bank, and there have been reports of more occupation material immediately north of Hyde lane.<sup>1</sup> In general the pottery dates from the first and second centuries A.D. more often than from the third and fourth.

Several of the villas in the countryside round Verulamium had detached bath houses.<sup>2</sup> In its final stage, that at Park Street must have been very impressive, being rather more than a third the size of the dwellinghouse itself. The main periods of its construction fall into line with the greatest building activity at the villa, beginning in the mid-second century A.D. when the villa was expanding into a substantial house from the simple range of rooms erected more than half a century before. In its first stage the bath house provided the essential features of this aspect of Roman civilization, probably having no more than four rooms with a verandah on the east side. It was well built with little tile in the predominantly flint walls. An unusual type of construction was found in the rooms provided with hypocausts where the base of the wall-foundations was usually just over 1 ft. above floor level. The clay below was rendered as well as the masonry and seems not to have required any shuttering such as was found in similar conditions in a cellar at Verulamium.<sup>3</sup> Anyway timber would have been useless in a hypocaust. The reason for this peculiar form of construction may be bad planning on the part of the builders who began

<sup>1</sup> Information from Dr. Ingoldby.

<sup>2</sup> *Lockleys*, very similar in development to Park Street, did not have a bath suite in the main block but one was inferred from fragments of flue tile. *Roman Villas at Boxmoor*—J. Evans: the villa in the garden of Boxmoor House appeared to be a simple range of rooms like the early plans of Park Street and Lockleys without a bath suite. *Netherwyld Farm, Aldenham*: a separate bath house

has been recently examined by the Watford Archaeological Society; interim note forthcoming.

<sup>3</sup> S. S. Frere, 'Excavations at Verulamium 1958, Fourth Interim Report'. *Ant. J.*, XXXIX (1959). The cellar of the late third-century building XIV, 5 Insula XIV, had been an afterthought and as the foundations did not descend to the required depth a heavy timber revetment was necessary.

the walls without allowing for the excavation of the hypocausts. Water for the baths seems to have been piped from the higher ground to the west, for remains of wooden pipes were found only a few yards away; the source could have been the well immediately east of the house.

As in the history of the villa there was a lengthy period of stagnation in building activity until about 300 A.D. The villa was then substantially reconstructed after a possible period of desertion and this rebuilding programme was matched by an enlargement of the bath house. The original rooms continued to be used but four more were added, one of which was a second *caldarium*. Five constructional phases, probably little separated in time, can be recognized, and may have been due to remodelling the rooms following a fire. There was nothing to show how the building had ended its days. It may have remained open and ruined for some time, for the *pilae* tiles in Room I had been removed before masonry had fallen and smashed its lower floor. The pottery in the robbers' trenches suggests that the existence of the building was known in the early nineteenth century.

The functions of the other two masonry buildings remain in doubt. Building A had its origins near the end of the first century A.D. but it was largely constructed in Period VIII, about 300 A.D., at the time when the bath house was being enlarged. It had been so badly damaged that its history was even more difficult to interpret. A domestic rather than industrial or agricultural use is implied by the finds of painted wall plaster and window glass. Room x contained a small bath or tank, although this was only just over 1 ft. deep, and Room II had a tiled floor and indications of a stoke-hole outside it. From this the building may be interpreted as a simple bath house with a heated room on the north and a *frigidarium* with a minute cold water tank in the southernmost room. It could also, however, have been a small dwelling house with a heated room, and a cold water tank for washing or culinary purposes. If it was a bath house it is difficult to see the need for its construction at the same period as the main bath house was being enlarged, unless it was a small establishment for the farm workers. Of the two explanations the second seems more feasible. The long wing walls and the lean-to against them might have had an agricultural purpose, and the lack of distinct floors, their rough appearance and extent make them possible candidates for stables or shippens. Set well away from the villa in the working part of the area it is tempting to see this structure as a farm-worker's house, rather than an offshoot of the main dwelling house. The provision of a degree of comfort in the Romanized manner would suggest it belonged to a senior employee, of bailiff or foreman rank.

Building N is even more puzzling. It was the earliest out-building found on the site, being contemporary with the first stone houses in the late first or early second centuries. It was well built, if clumsily laid out, and heated, but contained no surviving evidence of domestic use. If it were not for the clear remains of a furnace at the east end, it might well have been interpreted as a ventilated barn or granary such as was found at Lullingstone.<sup>1</sup> It is unlikely

<sup>1</sup> G. W. Meates, *Lullingstone Roman Villa*.

to have been the Period VI bath house, since the whole building was heated and there was no room for a *frigidarium*, but this interpretation must be considered. Alternatively, it might have started as a detached suite of heated rooms, possibly for dining, for the use of the occupants of the villa, and later become part of the agricultural complex.

The other structures found at Sites G, H and J were very rough and crude. The low walls found were probably never more than footings for timber buildings. Because of their flimsy nature it is likely that others were unrecognized by the gravel diggers as they worked across the field. It was impossible to produce a complete plan of any building. From the scatter of domestic rubbish it would seem that they served as workshops or perhaps as huts for the workers. Rough cobbled floors existed here as they did east of the bath building and west of Building A. The whole of this area between the villa and the river would therefore seem to be the farmyard or working area with out-buildings of various sorts set haphazardly about it. In some respects the Park Street establishment compares with that found at Hambledon<sup>1</sup> or at Langton.<sup>2</sup>

The burials just north of the bath house are not a common feature near villas. Those at Hambledon were of a humble sort and the infant burials were performed clandestinely. In the area round Verulamium are two other possible examples. A number of fairly rich graves were found in the neighbourhood of the Boxmoor villas,<sup>3</sup> but it is not certain whether there was a direct connection. At Munden House, near Watford, grave goods have been found<sup>4</sup> and there are remains of a substantial Roman building, perhaps a villa.<sup>5</sup> It is unlikely that there were more than two graves of this nature at Park Street or they would have been reported by the gravel diggers. The two tombs are built in a similar style and, being placed close together, are possibly those of a husband and wife. The burials appear to be roughly contemporary with the rebuilding of the villa in about 300 A.D. It is just possible that the graves are those of the owners responsible for the renovation of the property who, because their lives had been closely associated with it, chose to be buried near their house.

Of great interest and importance is the evidence for the activity along the riverside and the use made of it. The River Ver at this point has changed its course over the centuries, and river silt was traced as far as 460 ft. west of the present stream. The area is marshy and has several small streams which indicate a certain movement of course. Gravel digging too over the years must have assisted natural changes. Traces of timber work, therefore, have occurred well to the west of the present river. The discoveries were chance ones and without a great deal of excavation it was impossible to follow the early river course or to learn more of such a feature as the drain or aqueduct. The significant discovery must be the wharf or quay immediately east of the villa complex.

<sup>1</sup> A. H. Cocks, 'A Romano-British Homestead in the Hambledon Valley, Bucks', *Archaeologia*, LXXI, 141.

<sup>2</sup> P. Corder and J. L. Kirk, *A Roman Villa at Langton, near Malton*.

<sup>3</sup> J. Evans, *Roman Villas at Boxmoor*.

<sup>4</sup> V.C.H., *Herts.* IV, 165.

<sup>5</sup> Information from Dr. Ild Anthony, Director, Verulamium Museum.

Such a substantial timber structure seems to point only to this interpretation, and whether it was at the side of the river or of a canal leading from it, the implication is that of water transport. Although Watling Street lay so close it is feasible that the traffic of bulky cargoes would have been effected by water.<sup>1</sup> Barge traffic would have suited the villa grain produce as well as the tileries and potteries in the neighbourhood. The tile kilns of Black Boy Pits and at Netherwyld Farm<sup>2</sup> were close enough to the river to benefit. Communications by these means could have connected Verulamium, higher up stream, with the Thames at Staines by way of the River Colne.

The excavations of 1954-7 did little more to elucidate the economy of the Park Street villa. Iron making, for which evidence was found in one of the furnace rooms of the bath building, was probably only serving local requirements. Copper smelting, which was also indicated, may have been of a similar nature. The thick scatters of tiles at Sites H and J probably mean nothing more than the proximity of a workshop; there were no indications of kilns. The excavations support by inference rather than by actual evidence the interpretation by Mrs. O'Neil that arable farming was the main function of the villa. It was a corn producer, probably shipping its grain to Verulamium and elsewhere by water, and, during the last century of its existence, reaching a high level of prosperity and Romanization.

<sup>1</sup> Water transport was used in the Fens in Roman times. Quays or hithes for barge traffic have been found near Stanground, Peterborough, Stuntney, Ely, Clayhithe and Upware. Cyril Fox, *The Archaeology of the Cambridge Region*, 223. O.S., *Map of*

*Roman Britain*, 3rd ed., shows the Roman canal system in eastern England.

<sup>2</sup> Discovered by Dr. Norman Davey, 800 yds. west of Netherwyld Farm, in 1941. *Journal of Roman Studies* (1942-3), 112.

## THE FINDS

## COINS

By P. E. CURNOW

## BRITISH

*Tasciovanus* (c. 15 B.C.—A.D. 15) AE

- 1 O/- — Star-like ornament formed of two interlacing squares with curved sides. One square with looped ends, four ringed ornaments in the design, cross in centre.  
R/- *TASCI*. Horse galloping to left. Ring ornament (and trefoil ornament above).  
Mint Verulamium. Date — Refs. Mack 175. From lower mortar floor, Room 1, Building A.

*Cunobeline* (c. 10–40 A.D.) AE

- 2 O/- *CUNO/BELINUS* Beardless helmeted head right.  
R/- *TASCIOVANII* Sow? (Boar) standing right above ornamental exergual line with letter (F) below.  
Mint Camulodunum. Date Middle Period of Cunobeline. Refs. Mack 243.  
From filling of pit N. of Room 11A, Bath Building.

## ROMAN

*Constantius II* (323–37–61 A.D.)

- 3 O/- — illeg. Bust diademed and draped right.  
R/- — illeg. Legionary spearing fallen horseman. (*Fel Temp Reparatio*.)  
Mint illeg. Date c. 353–61 A.D. AE Minion Diam. 10.5 mm. From trial trench P III.
- 4 O/- (D) N Con Bust diademed and draped right.  
R/- — illeg. ? as above 3. (*Fel Temp Reparatio*.)  
Mint illeg. Date c. 353–61 A.D. AE 4 Sige. Diam. 12.5 mm. Bath Building, unstratified.

*Fourth Century — Illegible*

- 5 O/- — illeg. Bust diademed, draped right and traces of lettering.  
R/- — illeg. ? as above 3. (*Fel Temp Reparatio*.)  
Mint illeg. AE Minion. Diam. 10 mm. From trial trench P III.
- 6 Quite illegible. AE 4 Sige. Diam. c. 11 mm. From Room x, Bath Building.

## MEDIÆVAL ENGLISH

*Henry VII* (1485)

- 7 Groat — Brooke Type III, p. 170, Pl. XXXVII, 4.  
Mint London. Issue Cinquefoil c. 1495–1504. Room 1, Building A, unstratified.

## FLINTS

By DR. M. W. THOMPSON

One of two flakes found below a first-century A.D. level on Site H. The flake is 2.6 ins. long and 1.7 ins. broad, of grey patinated flint, the surface smoothed by rolling in a stream. There is secondary flaking all the way round the edge and indications that it has been used for battering at the distal end. There are slight indications of a prepared striking platform and the shape of the flake lends support to the view that it was prepared by the Levallois technique. It is a poor example, however, and one cannot say more than that it is probably a Levallois flake of late Pleistocene times.

## POTTERY

Most of the pottery found can be paralleled by that illustrated in the villa report. Because of this and the general lack of stratified material associated with datable objects, the pottery described and illustrated here is confined to those types which were not found at the villa or which are important for the interpretation of individual sites.

DECORATED SAMIAN WARE (*Terra Sigillata*). By B. R. HARTLEY.

- 1 Building A. Room I. Two sherds from the same bowl, one piece heavily weathered, the other in fair condition. Form 37. South Gaulish ware. Ovolo with blurred trident torque. The style of decoration (three zones: (i), chevrons; (ii), panels with wavy lines and leaf-tips alternating with panels containing small medallions; (iii), s-shaped gadroons) is very close to many bowls in the Pompeii Hoard of A.D. 79 (*J.R.S.* IV), so the bowl may be dated c. A.D. 75-85. Bowls of this class are rarely stamped or signed, so it is not possible to assign it with certainty to a particular potter. Dog; Hermet, *La Graufesenque*, pl. 26, 20; OSW. 1963.
- 2 Unprovenanced, found on gravel diggers' spoil heap. Form 37. Central Gaulish ware. A heavy bowl with clumsy footstand. The decoration is apparently a continuous scroll made by using festoon stamps, the right way up and inverted alternately. In the lower concavities are three rings, a basket of fruit (*Dech.* 1085) and a Pan (OSW. 710) used by several potters of Lezoux. Antonine, c. 150-180.

## COARSE POTTERY (Fig. 7)

*Site R*

This group (1-8) is entirely Belgic in character but includes forms which remained in use for a short time after the Roman Conquest. The general date for this scatter of domestic rubbish can, therefore, be placed in the third quarter of the first century A.D.

- 1 Jar in hard grey-black ware, light brown exterior burnt grey at rim and neck. Well made with horizontal grooves decorating the shoulder. The commonest Belgic type at Verulamium, not surviving for long after the Roman Conquest (*Verulamium*<sup>1</sup>, fig. 20, 61c; and *Lockleys*<sup>2</sup>, fig. 7, 21).
- 2 Jar with combed shoulder in hard grey-black ware with some grit. Almost a bead rim, interior of which has a porridgy finish. A more refined version of O'Neil<sup>3</sup>, fig. 15, 10, and similar to *Verulamium*, fig. 21, 66b. Bead-rim pots were more common in Roman Verulamium during the quarter-century following the Claudian invasion than before.
- 3 Small jar of gritty grey ware. Some burnishing on the smooth, well finished outer surface. cf. O'Neil, fig. 16, 4, mid first-century.
- 4 Small cordoned jar in a gritty grey-black ware with burnished exterior. cf. O'Neil, fig. 16, 2.
- 5 Small cordoned jar in fine brownish ware with a smooth brown finish. The sharply moulded rim has a parallel at *Verulamium*, fig. 21, 70.
- 6 Bowl with slightly curved wall and flanged rim in dark grey ware. Exterior lightly tooled, interior has porridgy surface. cf. *Camulodunum*<sup>4</sup>, form 42. At Colchester considered to be the apparent prototype of the long-lived Romano-British flanged series. Period VI, 61-c. 65, A.D.
- 7 Platter in brownish gritty ware, burnt grey. Simple rim and footstand. Native copy of Gallo-Belgic platter. (*Verulamium*, fig. 12, 19; and *Camulodunum*, form 21A).
- 8 Platter in light grey ware, soapy exterior. Faint cordon on shoulder. (*Verulamium* fig. 12, 21; and *Camulodunum* form 21D).

*River silt near the pile rows*

- 9 Rim of storage jar of grey gritty ware with soapy texture. Probably first-century A.D. (O'Neil, fig. 15, 20; and *Verulamium*, fig. 18, 60a and b).

*Site J: from below floor level*

- 10 Hand-made bead-rim bowl in grey-black gritty ware, irregular porridgy surface. A pre-Conquest native form (O'Neil, fig. 16, 16).

<sup>1</sup> R. E. M. Wheeler, *Verulamium* (1936), Soc. of Antiquaries Research Report, No. 11.

<sup>2</sup> Ward Perkins, 'The Roman Villa at Lockleys, Welwyn', *Ant. J.*, XVIII (October, 1938).

<sup>3</sup> H. E. O'Neil, *Arch. J.*, CII (1945).

<sup>4</sup> Hawkes & Hull, *Camulodunum* (1930-9), Soc. of Antiquaries Research Report, No. 14.

- 11 Lid in hard, thin, light-grey ware. Well made, of Roman type, rim grooved internally. (*Camulodunum*, pl. LXXXV, 19). At Leicester (*Jewry Wall*<sup>1</sup>, fig. 31, 11) it was found that there was no particular chronological distinction in the form of the lids.

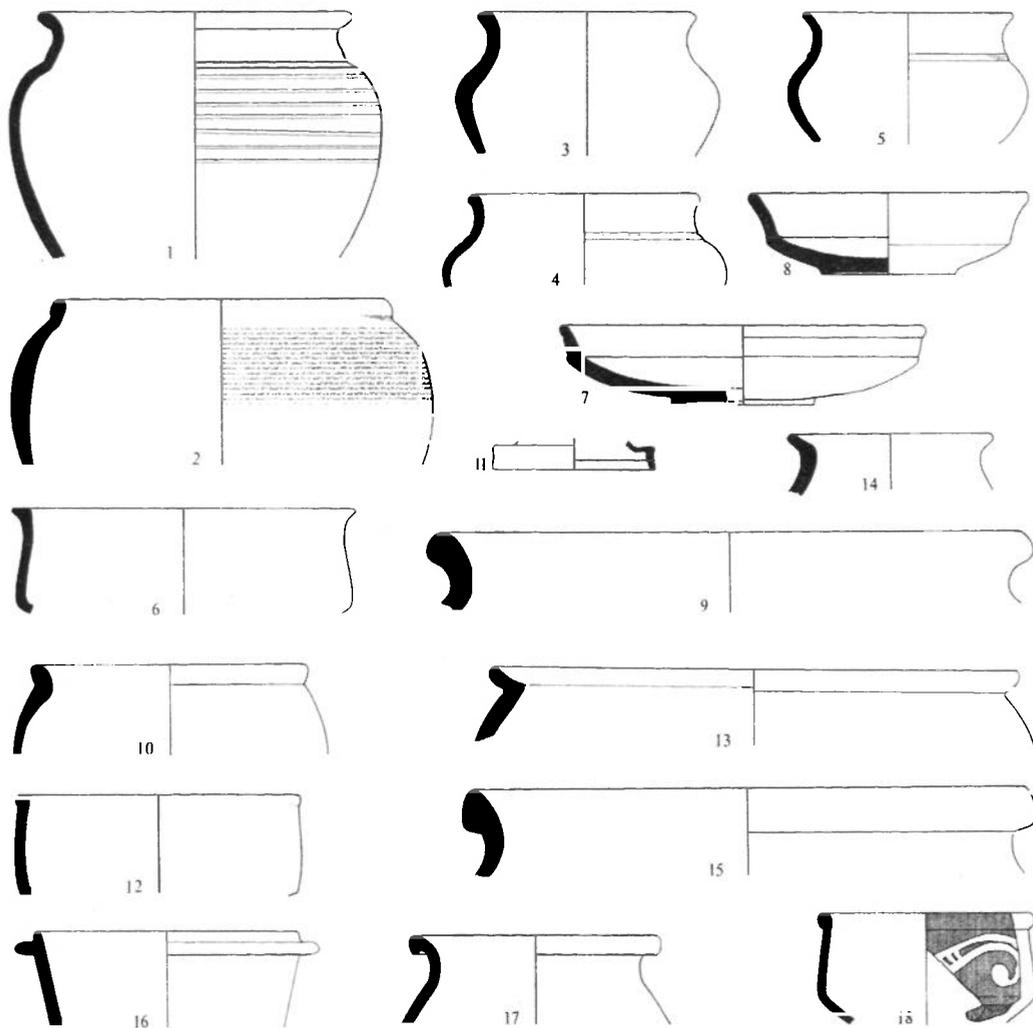


Fig. 7. Coarse Pottery: 1-8, from Site R (p. 125);  
9-18, from various sites (pp. 125-127) (½)

<sup>1</sup> Kathleen Kenyon, *Excavations at the Jewry Wall Site, Leicester* (1948), Soc. of Antiquaries Research Report, No. 15.

*Building A: Room 1, below debris*

- 12 Bead-rimmed, carinated bowl of a hard grey sandy ware with curved walls (*Camulodunum* form 47A).

*Site G: below cobbled floor*

Associated with sherd of Samian, form 31, central Gaulish ware. A typical Antonine piece, heavily weathered.<sup>1</sup>

- 13 Jar with internal grooving of the flanged rim to take a lid. Grey-black soapy ware, light brown exterior. *cf.* Corder, *Pit 6<sup>2</sup>* type 6F. Similar form but the ware is more akin to that used in Belgic pottery. Probably late first-century A.D.
- 14 Jar with slight groove on inside of rim. Grey-black, soapy ware with light brown sandy finish.

*Rubble Filling of Bath Building*

- 15 Jar in hard, black, shelly ware, buff coloured exterior, late second-century (*Verulamium*, fig. 28, 29; and *Insula XVII<sup>3</sup>*, fig. 16, 10).
- 16 Flanged bowl in hard grey ware. The flange is horizontal and just below the bead. *cf.* O'Neil, fig. 18, 13. Fourth-century.
- 17 Cooking pot in pink shelly ware with grey core, light brown surface. Undercut rim. After 340 A.D. (O'Neil, fig. 20, 10; and *Verulamium Theatre*,<sup>4</sup> fig. 11, 21).

*Unstratified*

- 18 Imitation Samian bowl, possibly derived from either Ritterling Type 9 or Dragendorff Form 44. Pinkish red, rouletted at the carination and decorated with a scroll pattern in white slip. Mid fourth-century.

## BONE OBJECTS

Implement of stag's horn (Fig. 9, 1), sharpened to a point. From Bath Building, Room IIA. A similar object was found in a pit in the Romano-British Village, Woodcuts Common.<sup>5</sup>

Comb: end of a two-sided comb with 13 teeth to the inch on one side and 16 to the inch on the other. The two lengths of bone on either side of the comb, between the teeth, have the edges decorated with shallow cuts and both strips are rivetted together with iron rivets. There is a small hole 2.5 mm. in diameter in the broad end of one side. It was found in the rubble filling of Room IX of the bath building.

## METAL OBJECTS

By L. BIEK, Ancient Monuments Laboratory, Ministry of Public Building and Works

## COPPER ALLOY

- 1 Fragment of spoon (Fig. 8, 1). The bowl of a spoon with a short length of stem curled back on itself to meet the convex side of the bowl. Beyond that, the stem appears to have been severed at an angle, leaving a sharp tip folded under the 'curl'. This would appear to have been deliberate rather than accidental. It may have been intended to shorten the stem in order to provide a special type of spoon; or, possibly it is part of a leaf-shaped ornament.

From the appearance of exposed portions (on the convex side), the metal would seem to be basically a tin bronze with some zinc and possibly lead. The concave surface at first sight appears to carry 'mauve' corrosion products indicative of silver, but closer

<sup>1</sup> Information given by Mr. B. R. Hartley.

<sup>2</sup> Philip Corder, 'A Roman Pottery of the Hadrian-Antonine Period at Verulamium', *Ant. J.*, XXI, 271.

<sup>3</sup> K. M. Richardson, 'Report on Excavations at Verulamium, Insula XVII, 1938', *Archaeologia* XC, 81.

<sup>4</sup> Kathleen Kenyon, 'The Roman Theatre of Verulamium', *Archaeologia*, LXXXIV, 213.

<sup>5</sup> Lt.-Gen. Pitt-Rivers, *Excavations in Cranborne Chase*, Vol. 1, 133.

examination (especially under the microscope) suggests that this appearance is produced largely by ruby-coloured crystals of copper oxide (cuprite) in association with whitish-grey translucent material. In the bowl lies a concretion made of a similar-looking substance; this consists mainly of lead, but also contains some tin<sup>1</sup> and would suggest the corrosion product of a lead-rich 'solder'. Such use of the object would be inconsistent (except in *re-use*) with an ornament, but might be associated with fine soldering by a jeweller.

Found unstratified, south of Building N. Material found nearby suggests that it may have come from a rubbish pit.

- 2 Tweezers (Fig. 8, 2). Superficially there seem to be patchy indications of a dull greyish white metal (plating residue); but they do not occur on what would have been the original surface and therefore probably indicate merely that the alloy is a fairly high-tin bronze.

Found in Room x of the Bath Building lying on the remains of an *opus signinum* floor.

- 3 Decorative plaque (Fig. 8, 3). Repousse or punch-decorated, apparently tin-bronze with some zinc (?). On the 'front' there is a complete wash or plating of (now dark) grey metal. Some of this also appears on the back and this may indicate that this metal (which from its appearance contains a fair amount of lead) was in fact washed over the surface at the same time as it was used to 'solder' the plaque to some (? metallic) support. From a trial trench east of Room IIA of the Bath Building.

- 4 Plain bronze ring (Fig. 8, 4).  $1\frac{1}{8}$  inches in diameter. Found below a cobbled floor at Site G.

- 5 Fragments of dross? Although seemingly a buckle or similar fragment, under the microscope the material is shown to be quite random in disposition, and the surface as cleaned is consistent with solidification of spill from a casting operation.

From the rubble filling of Room I of the Bath Building.

- 6 Irregular strip with white metal coating. Although punctured in many places in the manner of punched lettered strip, all the depressions and holes in this case are due to corrosion. The object seems to be part of a strip of copper (alloy), possibly folded over lengthwise deliberately at some time but received flattened out, and with both sides well-covered with a solder-like metal.

From the rubble filling of Room VI of the Bath Building.

- 7 Small fragment with white metal coating. From its appearance, the basis metal may be a high-tin bronze, and it is covered all over with a white metal not unlike that found on the example above, except that evidence of application of such a 'solder' is less marked, here, on the convex surface which may in fact be tinned.

From the rubble east of Room III of the Bath Building.

- 8 Larger fragment very similar to the above. At first sight, this fragment might have been part of a larger fragment to which the above also belonged, despite the difference in thickness; the white metal characteristics are virtually identical.

Found in dark brown clay north-east of Room III of the Bath Building.

#### IRON OBJECTS

- 9 Pipe-joint collar (Fig. 8, 5). Fragments of ring, most of which are part of a pipe joint. The joint (on the inside) and rib are clear, and so is the mineralised grain of the end of one wooden pipe, both inside and out; the other pipe is not clearly in evidence. The 'wood' is too heavily mineralised to permit identification.

Found at Site P, west of the Bath Building.

- 10 Folding razor (Fig. 8, 6). Composite object consisting of a blade hinged to a copper alloy tube (fragment). The iron component, although severely bloated by corrosion, appears from the X-radiograph most likely to be a blade, possibly that of a knife or razor, or similar cutting instrument. Although the further evidence is slight it would suggest that the 'cutting' edge was nearest the tube. This tube is (now) evidently

<sup>1</sup> We are grateful to Mr. J. S. Forbes and Mr. D. B. Dalladay, of the Assay Office, Goldsmiths' Hall, for kindly carrying out a spectrographic analysis of this material.

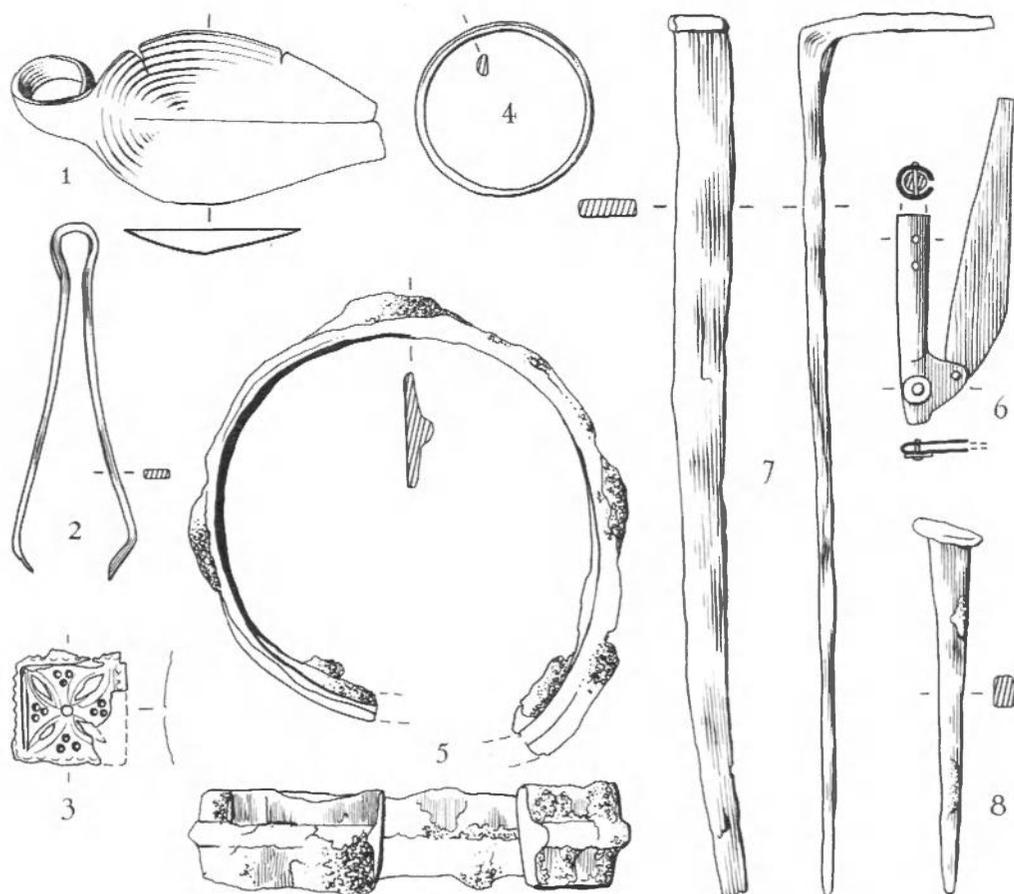


Fig. 8. Metal Objects: 1-4, Copper alloy; 5-8, Iron. (pp. 127-9) (1)

split longitudinally and tapers towards the hinge where it is flattened out into a broader folded clip-like shape. Each of the two 'leaves' of this clip is pierced by two holes, each pair being in register, one pair apparently rectangular with a round, and round-holed, washer (in line with tube axis) and the other round (on the projecting 'shelf'). No pins or rivets can now be seen *in situ* in this part of the assembly, but the remains of a possible (non-ferrous, possibly copper alloy) pin are contained in the rust nearby; from its position, it would seem to have come from the 'shelf'. In parts of the tube are mineralised residues such as might have been left by some organic material, like wood, but no structure is visible. Two copper alloy pins remain *in situ* and were evidently designed (perhaps with others ?) to hold such a material in place inside the tube. Found unstratified, north of Room 1 of the Bath Building.

- 11 Flanged iron bar (Fig. 8, 7). Found near the flue of the stoke-hole, on the floor of the hypocaust in Building N. Its purpose may have been a soot scraper or perhaps a cramp.
- 12 Nail (Fig. 8, 8). Found in soot and rubble filling of Room 1x of the Bath Building. This (4 ins. long) is one of the largest of the numerous nails found throughout the area examined. Several were  $2\frac{1}{4}$  ins. to  $2\frac{1}{2}$  ins. long. The smallest were generally about  $1\frac{1}{2}$  ins. long with a square-sectioned shaft. Both round and square heads were found.

## SLAGS

IRON SLAG. By H. F. CLEERE, The Iron and Steel Institute

A sample of the slag-like material found in a hypocaust in Room VI of the Park Street Bath Building was submitted to Dr. B. G. Baldwin, then of the Blast Furnace Laboratory at Imperial College of Science and Technology. He was asked to determine (a) whether the specimen was of artificial origin, and (b) its probable source. Two possibilities were suggested to him: (i) that this was a piece of ironmaking slag, or (ii) that it was a clinker formed from the burning of coal. In view of the nature of the site where the specimen was found, the latter explanation seemed to be the more probable, even though the conditions required for the formation of clinker were not likely to be obtained in a bath house furnace.

Dr. Baldwin reported as follows: '... the sample you sent to me contains 35% Fe. It showed evidence of being partially fused and I consider it to be artificial and not of natural occurrence'. This report confirmed that the specimen was an iron slag. The iron content is not unusual, even though it is much higher than that of some ores being used commercially today. Coghlan<sup>1</sup> quotes two Roman furnaces at Warrington with slags of 17% and 45% total Fe content respectively, whilst Straker<sup>2</sup> gives a range of 31-59% total Fe for Wealden iron slags. A long series of slag analyses from the Sieg area of Southern Germany published by Gilles<sup>3</sup> recently gives comparable figures. The specimen found at Park Street is undoubtedly iron slag from an early iron furnace; it is impossible to assign an exact date to it, since progress in ironmaking technique was very slow during the first millennium A.D.

The associations of the find must date it to the latter part of the Roman occupation of Britain. It is very difficult to understand exactly how this piece of slag found its way into the flue of the Park Street bath house, since no other evidence of ironworking was forthcoming. That ironmaking was carried on in so-called 'industrial' villas is evidenced by the Llantwit Major villa,<sup>4</sup> but the Park Street villa appears to have been primarily agricultural.<sup>5</sup> However, the decay of communications in the fourth century might well have led the owners of the Park Street villa to essay ironmaking; adequate supplies of ore lay quite close at hand in Northants. One can only postulate that the bath house became a less essential factor in the daily life of its owners, and so the existing furnace used for heating it was converted into an ironmaking furnace — not a very complicated operation in view of the simplicity of the furnaces used at that time. Superfluous slag was no doubt shovelled into the now disused bathrooms, and found its way into the flues when the floors decayed. It is regrettable that the stoke-hole of the baths had already been destroyed before excavation began, since it might well have given further evidence of the resourcefulness of the inhabitants of villas in fourth-century Britain.

COPPER SLAG. By L. BIEK, Ancient Monuments Laboratory, Ministry of Works.

An apparent lump of copper, from the courtyard of Building A, was submitted to the laboratory. When received, its appearance suggested that it might be a stone or quantity of sand, in part penetrated and consolidated by copper (alloy) at some stage, either as metal or during the corrosion of some metal object nearby. X-rays failed to reveal any significant detail, the results indicating that the material was very radi-opaque. The lump was accordingly gas-reduced in the normal manner to reveal any metallic residues.

Examination under the microscope of a minute fragment broken from the surface at this stage and also of the fractured section so produced, has revealed a vesicular black-grey matrix inter-penetrated by what are now residues of metallic copper (alloy). It seems unlikely that this metal has been freshly reduced, from corrosion products *in situ*, by laboratory treatment, and the material appears to be a dense copper smelting slag containing copious quantities of metal which were slightly and superficially corroded when received and which have been fully re-reduced by the laboratory treatment.

<sup>1</sup> H. H. Coghlan, *Notes on Prehistoric and Early Iron in the Old World*, Pitt-Rivers Museum, Occasional Papers on Technology No. 8 (1956).

<sup>2</sup> E. Straker, *Wealden Iron* (London, 1931).

<sup>3</sup> J. W. Gilles, *Le Fer a Travers les Ages*, Actes du Colloque International (Nancy, 1956), 57-81.

<sup>4</sup> V. E. Nash-Williams, *Archaeologia Cambrensis*, 102 (1953), 89-163.

<sup>5</sup> H. E. O'Neill, *Arch. J.* CII, (1945), 21-110.

## ANIMAL REMAINS

Numerous animal bones were found among the rubble filling the rooms of buildings but most were either in a poor condition or unstratified. Those described came from either the river silt near the pile rows or from the rubbish pit, Site M.<sup>1</sup>

*Pile Rows*

Ox	Cranial region of skull of shorthorn type Metapodial fragment 2 distal ends tibiae, width 54 mm. (Chillingham 65 mm.) Rib Pelvis fragment Lumbar vertebra
Ox	Horn-core Scapula
Dog	Left mandible
Ox	Rib Metacarpal
Ox	Scapula Metacarpal Fragment of right mandible
Horse	Distal end femur Incomplete scapula Proximal end tibia, width 83 mm. (New Forest Pony 84 mm.)

Most of the bones are incomplete and only two measurements have been possible. That of the horse tibia shows that the bone was from an animal of approximately the size of a New Forest Pony. The incomplete ox skull is from an animal of shorthorn type and the single measurable tibia is smaller than that of the Chillingham with which it has been compared.

*Site M*

Sheep or goat	4 incomplete lower jaws Fragmentary coronoid Metatarsal of young animal Astragalus
Ox	3 ulna fragments Distal end tibia Distal end humerus Distal end metatarsal Incomplete astragalus Jaw fragment with tooth
Pig	Fragment of canine
Badger	Skull and lower jaw Foot bones

Mollusca: Cockle (*Cardium edulis*); Oyster (*Ostrea edulis*)

As in the villa, there were large quantities of oyster shells particularly in the Bath Building.

## STONE AND TILE FRAGMENTS AND WALL PLASTER

RELIEF-PATTERNED FLUE TILES. By A. W. G. LOWTHER.

Two pieces of flue tile bearing impressed patterns were found:—

- 1 Group 8. Die 50. The more interesting of the two pieces (Fig. 9, 2) has been assigned to this group. As yet no further pieces bearing this (still incomplete) design have been

<sup>1</sup> Identified by Judith E. King, Dept. of Zoology, British Museum (Natural History).

found at any other site. Some elements in the design look as though they may have been borrowed from patterns in common use for mosaic pavements, especially the 'key' or 'fret' pattern and, below it, what may be a crude attempt at a 'guilloche'.

Found in Building A, west of Room II.

- 2 Group 1. Die 35. This (Fig. 9, 3) belongs to the W. Chevron Group and comes from the same die as was used for many tiles found at Lullingstone Villa. This piece comes from a die which is still fresh and as originally made. The design was already known in part from a small fragment found at Dorchester, Oxon. Subsequently a small fragment from this die has been found at Bradwell, Essex. It has thus now been found at four widely separated sites in the counties of Oxfordshire, Kent, Hertfordshire and Essex.  
Found in the building rubble in Room IX of the Bath Building.

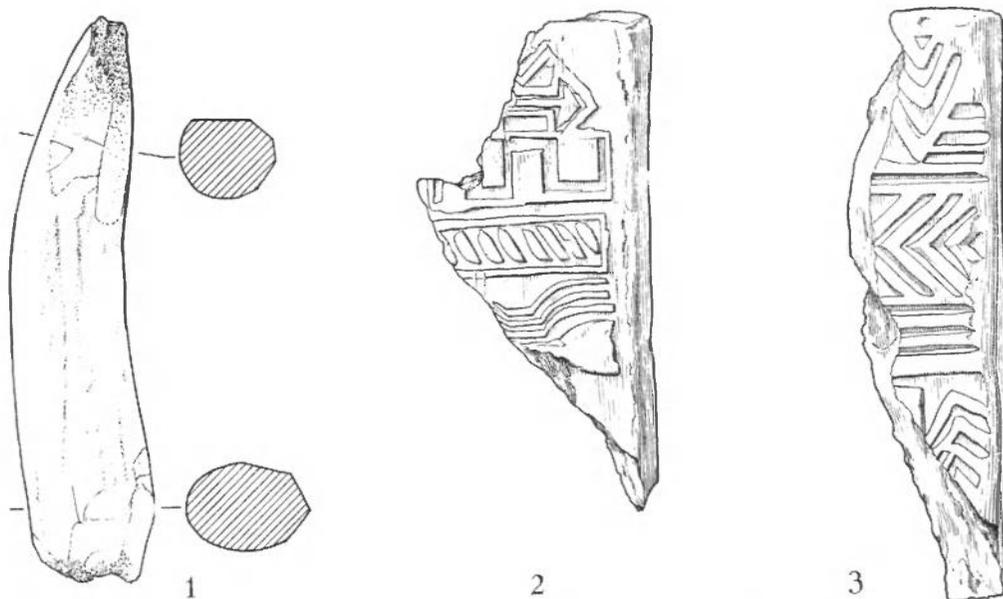


Fig. 9. Bone and Tile Objects: 1, Implement of stag's horn (p. 127);  
2-3, Relief-patterned flue-tiles (pp. 131-2) ( $\frac{1}{2}$ )

Among the many tiles found, two were of unusually large size. They were used in the small bath in Room X of Building A. The largest measured 12 ins. by  $17\frac{1}{2}$  ins, and was  $1\frac{1}{2}$  to 2 ins. thick. It had on one side an elliptical double grooved impression and some diagonal slashing. The other measured 11 ins. by 16 ins. and was  $1\frac{1}{2}$  ins. thick. It was slightly concave and had a splash of glaze on one edge.

#### PURBECK OR SUSSEX MARBLE

As well as the fragments used as a dado in Room X of the Bath Building, other pieces were found in Room IIA and east of Room III. They are all from polished slabs from about 1 in. to  $\frac{3}{4}$  in. thick.<sup>1</sup>

#### LIMESTONE

Large block measuring 32 ins. by 22 ins. and 11 ins. thick, found in the neighbourhood of the Bath Building, was of Jurassic oolite, probably from the Cotswold region.<sup>2</sup>

<sup>1</sup> Similar fragments were found in the villa. H. E. O'Neil, 99.

<sup>2</sup> Identified by F. W. Dunning, Geological Survey and Museum.

## MILLSTONE GRIT

Segment of a rotary quern (about 16 ins. in diameter), found east of the River Ver<sup>1</sup> on a gravel tip, had been later used as a saddle quern. It was very worn on both sides until it had broken again.

## WALL PLASTER

Fragments of painted wall plaster were numerous in the Bath Building and some were also found in Building A. In most cases the plaster was coloured white or red, but there were examples of borders or geometrical patterns in other colours. Yellow, pink, green and blue were other colours used, often as stripes. Areas of one colour were frequently separated from those of another by thin black lines.

The style of decoration appeared to have been simple with no ambitious patterns or attempts to reproduce scenes or murals such as existed in some of the town houses at Verulamium.<sup>2</sup>

ANALYSIS OF THE SANDS IN THE MORTAR SAMPLES<sup>3</sup>

Samples of mortar used in the walls of various parts of the Bath Building and Buildings A and N were analysed and compared with samples from the villa.<sup>4</sup> The interpretation of the building periods depended very largely upon the types of mortar employed in different walls. They bore close comparison with the building sequence of the villa where the results of the mortar analyses were confirmed by the general archaeological conclusions.

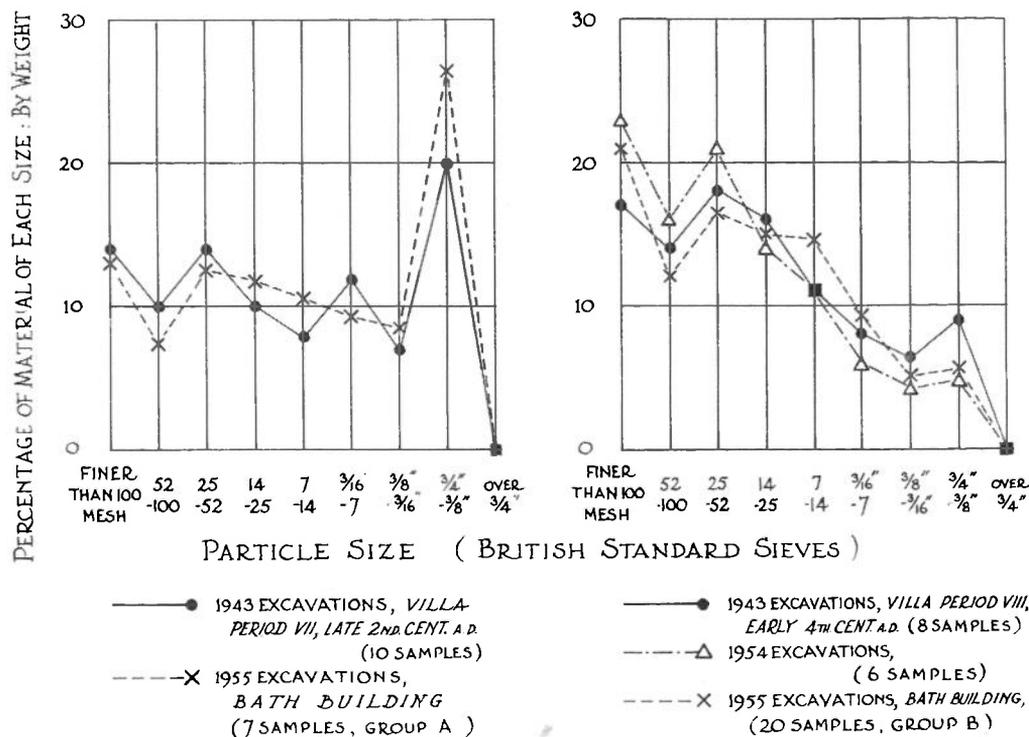


Fig. 10. Grading characteristics of sands in mortar samples

(See table p. 134 for details)

<sup>1</sup> Found by Dr. Ingoldby.

<sup>2</sup> S. S. Frere, 'Excavations at Verulamium', Interim Reports in *Ant. J.*, XXXVI-XLI (1956-61).

<sup>3</sup> Report kindly provided by N. Davey, D.Sc., Ph.D., F.S.A. (then at the Building Research Station.)

<sup>4</sup> H. E. O'Neil, 103.

Table 1: Analysis of samples of mortars from the walls

Identification mark	Description	Analysis of Aggregate Percentage of material retained between the following British Standard Sieves (nothing over ½")							Fineness modulus	Crushed tile *	Remarks	
		½"-¾"	¾"-1"	1"-No.7	No.7-14	No.14-25	No.25-52	No.52-100				Finer than 100
<b>Group A</b>	<b>BATH BUILDING (1955 Excavations)</b>											
2	S.E. corner of boundary wall, S. of railway cutting	23.6	5.0	6.4	11.4	12.7	15.5	10.2	15.0	3.52	t	Natural siliceous sand and gravel, of same type and grading as that in late 2nd-century mortars in villa (1943).
3	Room VII, apsidal wall S. of railway cutting	31.1	11.4	10.6	12.0	9.3	9.6	4.8	10.3	4.39	mt	
11	Room I, E. wall	23.0	10.5	9.8	10.2	11.4	14.8	7.7	12.5	3.85	mt	
13	Room X, W. wall	24.4	5.9	9.9	12.1	12.3	12.0	6.5	16.8	3.72	mt	
17	Room IX, W. wall	27.2	7.0	9.0	11.6	13.9	12.6	5.8	12.9	3.97	mt	
18	Room X, N. side of bath	21.9	11.7	8.5	9.4	10.2	13.2	9.6	15.8	3.70	t	
33	Room X, N. wall	35.1	8.8	10.0	9.9	11.3	10.3	5.5	9.1	4.48	mt	
	Average	26.6	8.6	9.2	10.9	11.6	12.6	7.2	13.2	3.95		
<b>Group B</b>												
5	Room VI, E. wall	0	5.5	9.2	17.6	16.4	18.3	12.9	19.7	2.48	t	Natural siliceous sand with more finer material than in the sands in Group A. Same type and grading as sands in the early 4th-century mortars in villa (1943), and Building A (1954)
6	Room III, N. wall, upper flint course	2.6	3.8	7.5	14.1	14.2	15.6	12.2	30.0	2.21	at	
7	Room II, N. wall	0	2.1	8.0	14.5	16.0	17.2	12.6	29.8	2.06	at	
8	Room IIa, W. wall	1.8	2.9	12.6	22.5	16.8	15.6	10.7	20.4	2.75	at	
9	Room XI, S. side of apse	9.4	3.8	6.6	15.5	22.4	17.3	9.6	15.9	2.95	mt	
10	Room III, E. wall	5.7	2.7	5.6	12.8	16.1	18.9	14.9	23.3	2.36	mt	
12	Room II, S. wall	2.2	2.7	6.9	15.6	16.6	19.0	13.9	22.8	2.30	at	
14	Room I, N. courtyard wall	11.7	4.4	9.3	16.6	15.5	15.1	10.6	16.4	3.09	—	
15	Room III, Top of tiles, W. side	2.1	4.9	8.2	14.8	16.9	19.6	11.8	20.3	2.46	t	
20	Room III, N. wall, tile course W. corner	8.2	12.4	10.1	13.6	12.0	15.8	10.2	17.5	3.15	t	
21	Room II, E. wall, lower course	13.3	1.6	5.7	13.4	14.5	16.8	11.5	23.4	2.73	at	
23	Room III, E. extension, bottom course	0	3.1	9.7	14.6	15.3	19.3	16.1	21.5	2.26	t	
24	Room IIa, E. wall	3.2	6.4	11.9	16.6	15.0	14.7	10.7	21.9	2.74	T	
25	Room I, W. wall	5.1	11.7	11.4	11.6	12.7	16.9	10.0	20.2	2.91	mt	
26	Room VIII, N. wall	8.1	4.9	10.3	12.1	12.9	17.2	12.8	21.4	2.72	—	
28	Room III, E. extension, top course	11.1	3.9	11.5	16.4	14.1	15.2	11.3	16.6	3.08	t	
29	Room VIII, W. wall	7.5	5.8	10.3	12.5	13.2	17.5	12.9	20.0	2.76	mt	
30	Room IIa, W. flank of stoke-hole	5.7	6.4	8.9	12.1	11.7	16.3	14.7	24.0	2.54	T	
31	Room V, N. wall	6.8	6.6	15.4	17.4	14.1	14.5	8.6	16.6	3.14	T	
32	Room II, W. extension, W. wall	4.0	7.7	10.5	14.9	14.1	16.5	13.4	18.4	2.75	T	
	Average	5.4	5.2	9.5	14.9	15.0	16.8	12.0	21.0	2.67		
	<b>BUILDING A (1954 Excavations)</b>											
7	Room II, N.E. wall between flints	0	4.3	5.8	11.6	14.8	19.3	16.5	26.0	2.0	trace	Some re-used material. Pieces of hard chalk
8	Room I, N.W. wall	0	3.6	6.5	9.0	16.3	26.3	19.6	18.7	2.11	trace	
5	Room I, N.E. wall between flints	8.6	3.6	5.4	11.4	13.0	19.1	16.4	22.6	2.48	trace	
6	Room I, N.E. wall below flints	7.5	3.6	4.9	11.8	15.0	21.5	17.1	25.6	2.55	trace	
58	Room II, N. wall	6.6	4.4	7.9	12.3	13.5	19.1	14.0	22.0	2.54	trace	
62	Room I, top course of N. wall	8.4	5.6	4.9	10.4	13.3	19.0	14.1	24.2	2.51	trace	
	Average	5	4	6	11	14	21	16	23			
	<b>BUILDING N (1954 Excavations)</b>											
78	N. wall	18.6	13.0	12.4	7.8	8.9	23.6	8.1	7.5	3.83	no tile	
	<b>PARK STREET VILLA (1943-5 Excavations)</b>											
	(i) Average of eight samples — Period VIII early 4th cent. A.D.	9	6	8	11	16	18	14	17			Very similar to Building A.
	(ii) Average of ten samples — Period VII late 2nd cent. A.D.	20	7	12	8	10	14	10	14			Similar to Building N.
	(iii) Average of six samples — Period VI late 1st to mid 2nd cent. A.D.	27	16	11	8	8	13	6	9			

\* mt = minute trace of tile.  
t = trace of tile less than 1 per cent by weight.

at = appreciable amount of tile but less than 2 per cent by weight.  
T = 2 to 5 per cent tile.

Table I (p. 134) sets out the result of the analysis and the figures obtained are compared with those published in the villa report. Dr. Davey adds that 'The method of presentation of the figures in this table is different from that given in the table published in the Park Street (villa) report. I now give the percentages between the sieves and not the total retained in the sieves, but one figure can be obtained from the other if required. I prefer this method of presentation'.

Samples 5, 6, 7, 8, 58 and 62 from Building A bear a close relation to those of Period VIII in the villa report, *i.e.* early fourth-century. The single sample from Building N seems to belong more to the Period VI mortars. The samples from the Bath Building fall fairly naturally into two broad groups which are labelled Group A and Group B. By similar comparison with the dated samples from the villa, it would seem that the sands in Group A are the same as those in Period VII (late second-century A.D.) walls of the villa, and those in Group B are the same as those in Period VIII (early fourth-century). It is likely and indeed probable, that the Group B mortars represent a series of additions to the building, but not very far removed in date.

The correlation of the sands from the mortar of the Bath Building with those of the villa and Building N are so good that the average grading curves of the sands from the various buildings have been reproduced in diagram form (Fig. 10). The curves show the percentage of various sizes of particles present in the sand, and it is clearly apparent that the later mortars have different grading characteristics from the earlier ones.

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