

THE ROMAN VILLA AT PARK STREET, NEAR ST. ALBANS,
HERTFORDSHIRE: REPORT ON THE EXCAVATIONS OF 1943-45

By HELEN E. O'NEIL

The villa, hitherto unrecorded, was discovered during work of gravel digging at Park Street by the firm of Messrs. Inns and Co., Ltd., in June, 1943, when flint walls and other building material were uncovered. These finds were reported by Mr. Michael Teague of Park Street to Mr. Philip Corder, Curator of the Verulamium Museum, St. Albans. Thereupon Mr. Corder, with Dr. Norman Davey and some friends, dug trial trenches to locate the extent of the remains. Subsequently they enlisted the help of the Ministry of Works, when it was seen that the site was that of a villa, of which the remains could not be preserved owing to vital war needs. The Ministry undertook to excavate the site before it was destroyed.

Permission for excavation was sought from the firm who were also the owners of the land. This was willingly granted by Mr. Robert Wallace, director of the firm, to whom thanks are due for his public-spirited action in the cause of archaeological science.

At the invitation of the Ministry of Works I undertook the excavation of the site with the admirable assistance of Mr. G. F. Flintoft of the Ministry, to whom I wish to express my thanks for his willing help with the arduous work, most of which was carried out under wintry conditions.

The work was begun on 18th October, 1943, and extended to May, 1944, with further investigations at later dates in 1944-45.

ACKNOWLEDGEMENTS

I wish to record here with sincere thanks the help and encouragement extended to me throughout the excavation, especially to all those friends who helped with the actual work of digging, chief amongst whom was Mrs. Margaret Jones. To Mr. Philip Corder for classifying, dating and drawing the pottery as well as for the drawing of the Soot-rake, to Dr. Norman Davey for the report on the building materials and for the drawings showing a reconstruction of the villa during its second and third phases of Roman occupation, to Dr. F. Oswald for the notes on the Samian ware. To Mr. W. F. Grimes for the identification of the Bronze Age sherd, to Mr. J. N. L. Myres and Lieut. G. C. Dunning for help with the Early Iron Age sherds, to the latter also for the drawing of the pot of that period, to Mr. J. Seymour Lindsay for the drawings of the reconstruction of the corn-drying floor as well as those of the iron objects, to Dr. J. W. Jackson for the notes on the animal bones, to Miss D. M. A. Bate for the report on the bird remains, to Miss K. B. Blackburn for the analysis of the charcoal remains, to Mr. D. B. Harden for the report on the glass, including Mr. E. M. Jope's analysis on the Alexandrian specimen, to Dr. K. P. Oakley for the geological information and help with the flints, to Dr. M. H. Hey for notes on some of the metal finds, to Professor J. Percival for identifying the wheat, to Sir Cyril Fox for help with the elucidation of, and to Dr. H. J. Plenderleith and the British Museum for the cleaning and preservation of the slave chain, to Dr. F. E. Zeuner for advice with soil samples, to Mr. A. W. J. Lowther for the note and drawings of the embossed flue tiles, and to Mr. E. Dillow of the Verulamium Museum for the arduous work of cleaning the pottery sherds, the bags of which ran into several hundreds.

Lastly, my thanks are due to my husband for unremitting help with the interpretation of the site and for the report on the coins.

PART I: GENERAL REPORT

THE SITE

The site of Park Street Villa¹ is an open pasture known as Bricket Field, some two hundred and thirty yards west of the River Ver, two and a quarter miles south of Verulamium. Across the river, Watling Street, which here deviates² slightly eastward to avoid a loop of the river, lies in full view of the villa. The villa lay on the slightly higher portion of the field, which is on a terrace of glacial gravel, based on chalk, some thirty to forty feet above river level (fig. 1).

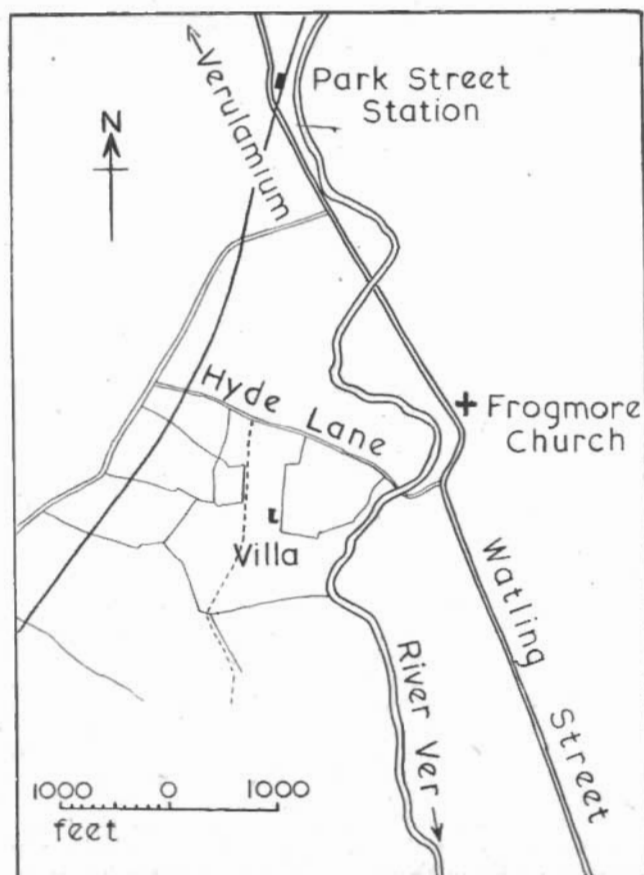


FIG. 1. MAP SHOWING POSITION OF VILLA

No remains were visible on the surface of the ground and no tradition seems to have lingered in the neighbourhood of the existence of any building, except for one hazy memory of the field as containing the remains of a supposed monastery. The use of the word 'field' in the name 'Bricket Field' in itself gives the clue to its

¹ In St. Stephen's Parish. 6" O.S. Herts XXXIX N.E. Long. 0° 21' 23"; Lat. 51° 42' 50". O.D. less 200'.

² By Frogmore Church.

PERIOD III. BELGIC GULLIES I, I', II, IV

¹¹ IV. ¹² CHALK FLOOR II. BELGIC PIT II. P.H. THUS ○

12 Y " CLAY FLOOR B. BELGIC PIT I. CHALK FLOOR I. P.H. THUS ○

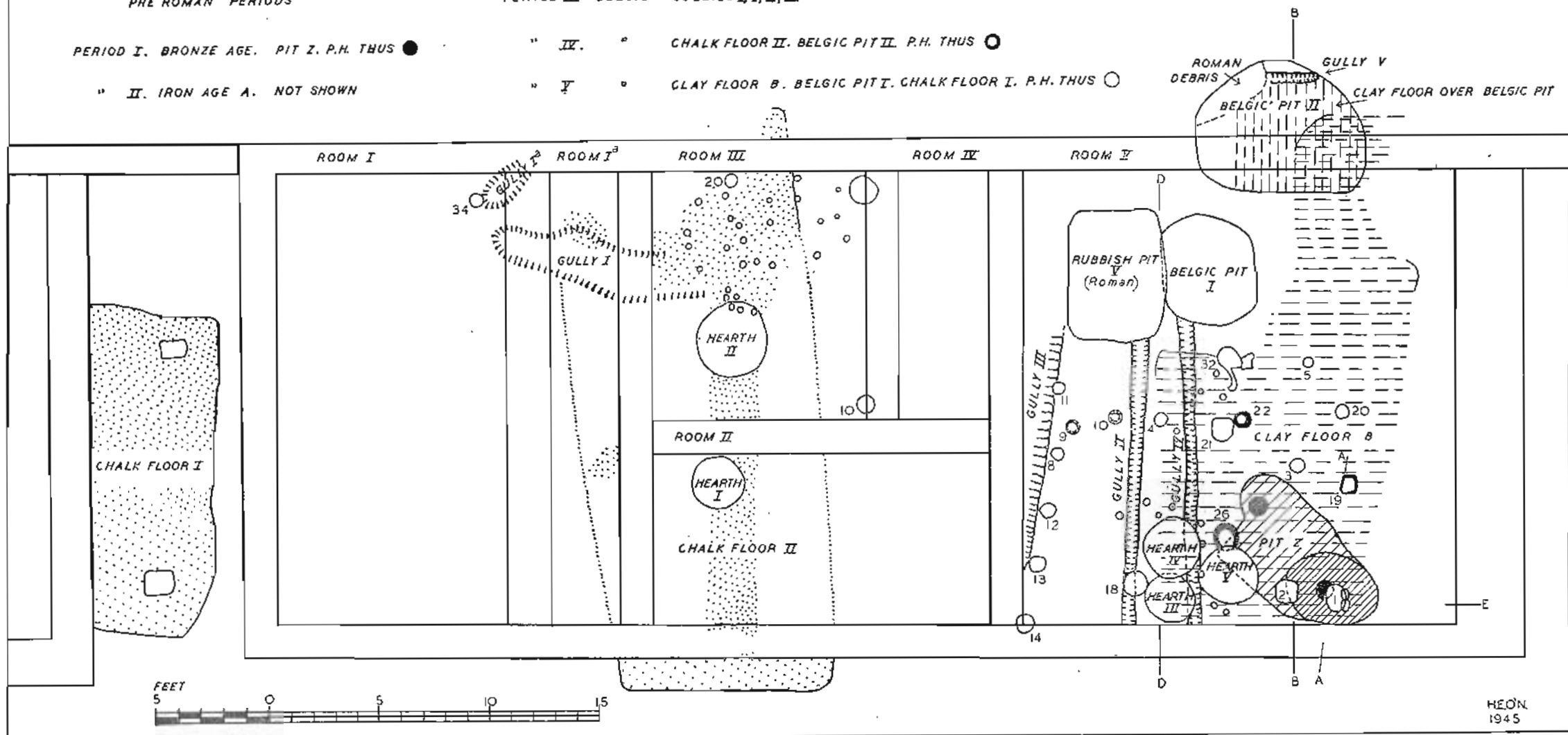


FIG. 2. PLAN OF THE PRE-ROMAN PERIODS ON THE PARK STREET VILLA SITE, WITH THAT OF THE FIRST ROMAN STONE HOUSE SUPERIMPOSED IN OUTLINE (cf. fig. 3)

HEON
1945

PARK STREET VILLA ST ALBANS

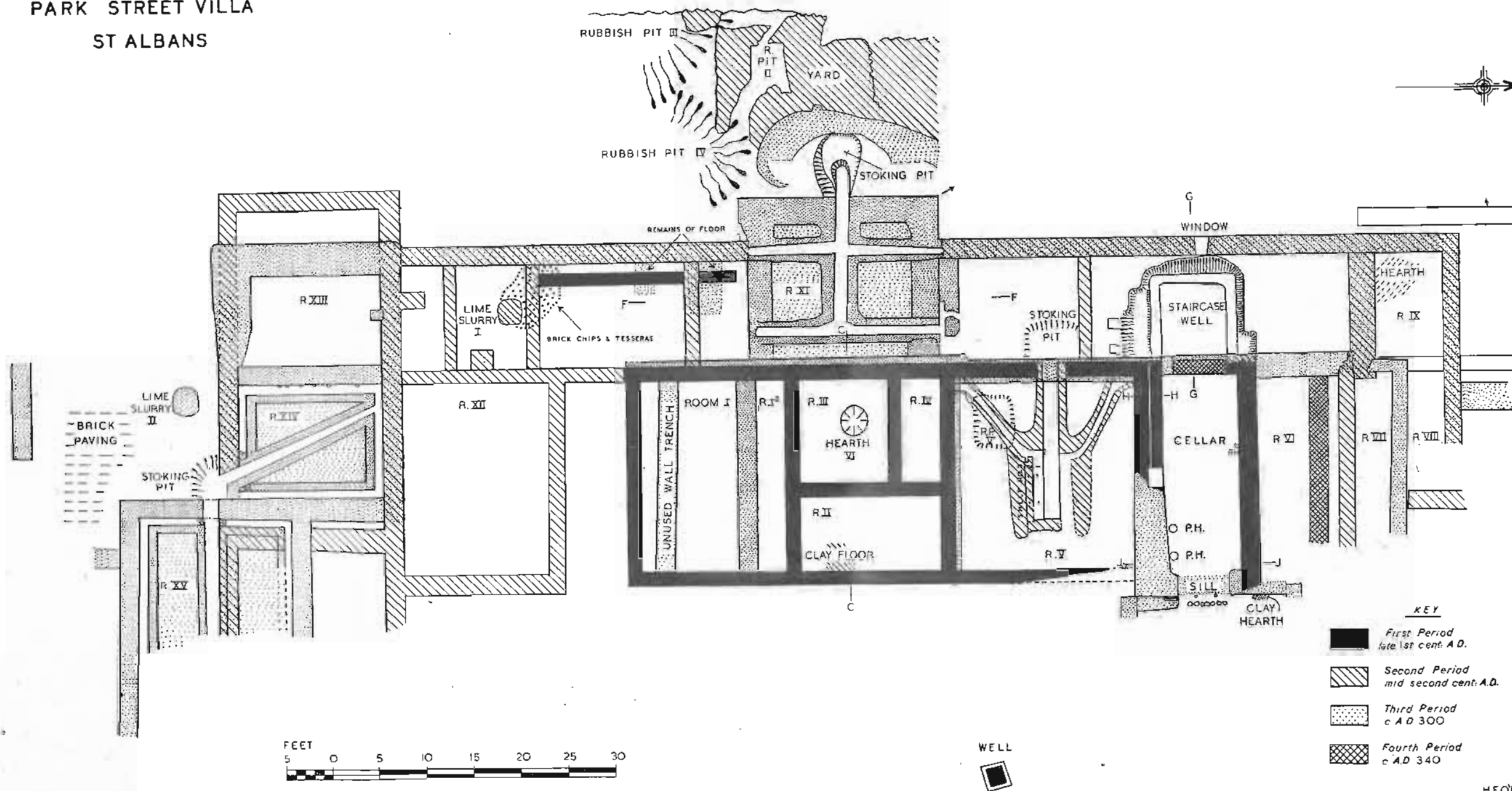
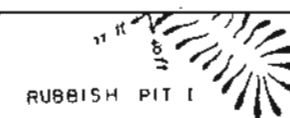


FIG. 3. PLAN OF THE PARK STREET VILLA, SHOWING THE FOUR PERIODS OF ROMAN OCCUPATION

use in mediaeval times as arable land, and it is known to have been under plough in very recent times for both corn and potatoes. Notice had also been taken of the excessive drying out of portions of the field in hot summers without recognition of that significance and the site unfortunately had not attracted aerial reconnaissance. Therefore, some damage was done by the mechanical grab before it was realized that remains of interest had been found. Nevertheless, the majority of the plan (fig. 3) of the villa was recovered which showed that in its heyday it was of simple corridor type. Later rebuilding and additions tended to obscure the plan and the full extent of these additions could not be recovered on account of damage mentioned above. But across the chasm created by the removal of the gravel (on E. side of site) and at a distance of about thirty yards from the main block of buildings at its northern and southern ends, there were slight indications of the base of truncated walls. These could not be excavated for fear of undermining a right of way. Further eastward still, in the adjoining field, the surface had long been removed by former gravel digging. It is hardly likely from the amount of plan recovered and the absence of other remains in the gravel face that much had been lost from gravel digging.

Excavation showed a long and continuous occupation of the site, extending over a period of 350 years at the beginning of our era, and, as there were finds of still earlier occupation it seems best to describe very briefly the main points brought to light and general conclusions in chronological order, to be followed by a more detailed description in Part II of the report.

PERIOD I: EARLY BRONZE AGE

Under the later Room v there lay a curious, shallow, oval pit (Pit z, fig. 2), dug into the natural gravel, and largely filled again with gravel. The only find from the filling was a small sherd of coarse brown ware, pronounced by Mr. W. F. Grimes to belong to an Early Bronze Age Food-Vessel (p. 31). The purpose of the pit is unknown.

PERIOD II: EARLY IRON AGE A

A group of large sherds, the remains of a vessel of Early Iron Age A2 type, was found in the debris filling of the main flue of the hypocaust in Room xiv (p. 73, fig. 12). It may be accounted for as having been disturbed and redeposited, when the Roman house was finally destroyed.

Although a large area of land was dug for gravel near this villa and a watch was kept on operations, no further traces of occupation at these early periods came to light except for one or two stray sherds.

PERIODS III, IV, V: BELGIC IRON AGE

Apart from these earlier possibilities there were three phases of occupation preceding the erection of the first stone house (fig. 2). All fall within the first century A.D. and all should be classed as Belgic, although the latest lay certainly within the Roman period. Their mutual relationship was clear enough, but the evidence for their absolute date, which is set out in full in Part II of this report, is not as plentiful as could be desired. It rests mainly upon the gradual appearance

of Roman sherds. In the first of the three periods (Period III) they are lacking. In the second (Period IV) only those appear, which could have been imported before the conquest, save for one or two sherds, which extend the time of this period just past A.D. 43. In the last period (Period V) Samian, such as appears at Colchester in or directly after A.D. 43 but not before, is quite plentiful. The clay-floored hut of this period (Clay Floor B) was destroyed by fire. There is nothing to conflict with the suggestion that this occurred at the time of Boudicca's revolt in A.D. 61.

The remains of Period III comprise three gullies with perhaps some post-holes and stake-holes. No intelligible pattern could be discerned owing to later disturbances but if as seems likely, Gullies 1 and 1a were connected with a habitation, the hut was probably oval or round rather than rectangular. Occupation must have been brief.

To Period IV is attributed considerable remains of a well-laid rectangular hut-floor of chalk (Chalk Floor II) measuring some twenty-six feet long and from ten to twelve feet wide. This lay at the base of a thick occupation layer, and is, therefore likely to have been laid down early in the period. It must, certainly be of pre-conquest date. No substantial floor has been found at Belgic Verulamium¹ or at Colchester,² but it seems that one occurred beneath the Roman villa at Lockleys, Welwyn, which was excavated in 1937 by Mr. J. B. Ward Perkins. Just such a deposit cut into by a stone wall of c. A.D. 65 is shown in Section A-B (Pl. LXIX) of the report,³ but unfortunately it is not referred to in the letterpress.

It seems clear now, however, from the Park Street evidence that it was the floor of a hut of the second period at Lockleys, which was searched for in vain by the excavator.

Under Room v of the later house there was an especially thick deposit of the General Belgic Level, the name given to the thick layer of occupation which covers this Chalk Floor II. Within the level here there were two successive hearths and some post-holes. If the tentative arrangement of the latter is correct, it indicates the former existence of a round hut.

Belgic Pit II, which is associated by inference with this period, yielded the most important single find of the excavation, an iron slave-chain (manacle with thirty-seven links of figure-of-eight shape, fig. 9) which is almost certainly of pre-conquest manufacture.

Noticeable features of the General Belgic Level were the frequent occurrence of humanly-struck flint flakes (fig. 7), although there were few real implements, and the presence of iron nails.

In Period V, which is ascribed with some confidence to the years from A.D. 43 (or soon after) to A.D. 61, two rectangular huts were in use. One had a floor of rammed chalk (Chalk Floor I, pl. 1b), six inches in maximum thickness, but with other dimensions uncertain, apparently saw only a little use. The other had a floor of clay (Clay Floor B) laid on top of the earlier General Belgic Level and across Belgic Pit II. This floor had been truncated by later building activities, but its general shape is not in question. Post-holes, etc., associated with it suggest that it may have had a roof supported on two approximately parallel rows of posts; in

¹ Wheeler, *Verulamium* (1936).

² Information kindly supplied by Mr. M. R. Hull, F.S.A.

³ *Antiq. Journ.*, xviii (1938), 339ff.

other words the hut may have had two 'aisles' beside a central 'nave'. It certainly had an associated pit and a back addition narrower than the main hut, comparable with those of certain Iron Age huts in Denmark.¹ Much burnt daub, presumably part of the wall of this hut before it was burnt, lay on the floor, and amongst the daub were many iron nails.

ROMAN: PERIOD VI

There does not appear to have been any considerable interval of time between the end of the third Belgic occupation and the rebuilding of the habitation in the improved Roman method. That it was carried out by members of the original family is most probable on account of the use of the selfsame site. The remains of the Clay Floor B hut were found to have been levelled out and Belgic Pit 1 filled in with some of its daub to prepare the way for the building of the first stone house in the Roman period within which it now became Room v.

The first stone house consisted of five rooms and a cellar, the whole laid out on a simple rectangular plan running north and south (fig. 3). The type of masonry was excellent, being of flints bedded in a coarse orange gravelly mortar with well-laid brick quoins. The walls were eighteen inches in width and remained at maximum four courses in height. There was no indication of the position of an entrance, but it appeared highly probable that the house faced east, towards the river and Watling Street. In addition the presence of the early rubbish pits close to the west side of the house, as well as the use to which the corridor was put at a later time, such as the stoking of the furnace to the hypocaust to Room v, does seem to point to the position here of back premises throughout the life of the house.

There was no direct evidence to show whether the house was a single or double storied building but from the width and substantial build of the walls it may well have been of the latter type. In all probability it was a house of timber construction on stone foundations. There was no lack of evidence of roofing material, as quantities of red tegulae and imbrices were found. In fact, such was the quantity of broken tiles that many broken pieces were used by the masons in the later additions to the house in place of bricks. Other materials used in the house were window glass, remains of which were found in the early rubbish pits, broken pieces of Purbeck or Sussex marble, and also numerous fragments of gaily coloured wall plaster, all of which showed that the house had many of the comforts and decorations then in vogue. In several of the rooms there were remains of a floor of clean yellow clay laid upon the top of the General Belgic Level.

The cellar (pl. 11a), an unusual addition to villas in Britain, was placed at the north end of the house. It was built in a hollowed-out area dug into the natural gravel and was twenty-three feet long and eight feet wide, the floor level being eight feet below present ground surface. It was approached by a staircase at its west end, where the hollowed-out area had been extended to form a staircase-well, a space nine feet square with vertical gravel sides. No actual remains of the stairs were found but the impression of slots in the gravel floor remained, which must have accommodated substantial timbers lying in a horizontal position (fig. 5, pl. 11a). These formed the foundation of a stout rectangular framework for the revetment

¹ *Antiquity*, 1937, 162ff.

of the gravel and the erection of the stairs. There was also a slot for the sill of the door into the cellar itself. The use of the cellar must have been for storage, but, as the only finds from it belong to a later stage of the villa's history, nothing is known of this in its first period. The remains of a recess (fig. 5, Elevation of S. cellar wall, pl. 1xb) were found in the middle of the south wall, having a round headed arch and jambs of brick and with plastered sides and back.

The position of the well was noted just before its final destruction by the grab, and only the bottom few feet could be closely examined. It lay about twenty feet from the house on its eastern front and was about sixteen feet deep. Little can be said about its construction, but it was two feet seven inches square at its base where four oak beams (pl. 1xc) were still *in situ* forming a square framework, to support the sides. The beams were roughly morticed at their ends to overlap each other at the corners of the well. The bottom of the well was packed with a mass of charcoal kept in position by a quantity of broken bricks and tiles; these were probably for filtering purposes (p. 44).

As already mentioned, appearances suggested but a slight interval between the destruction of the Clay Floor B hut of Period V and the erection of the first stone house. Direct evidence of the date of this building was very meagre, with the result that Period VI can only be related vaguely to the latter part of the first century A.D. The belief that it did indeed begin *c.* A.D. 65 is, however, strengthened by the filling of Rubbish Pits III and IV, found to the west of the house and referred to more particularly under the next period. The pottery found in them strongly suggests unbroken occupation of the site throughout the second half of the first century A.D.

PERIOD VII

With the growth of prosperity and probably with the need of repairs as well as enlargement for increased numbers after two or more generations had occupied the original small house, the villa was enlarged. A corridor eleven feet wide (pl. 1a) was added along the whole length of the west side of the original house, extending to a block of at least three rooms to the south and some further rooms to the north of the cellar. The type of masonry was of a rougher kind and the mortar used was a buff-coloured sandy mixture, some of which contained powdered brick. The base of the exterior walls of the original house were reused, as it was seen that they had been levelled to about one foot in height and the new mortar mix used above that level. On some lengths of wall broken tiles were laid as a bed for the new work; this was also the case with one of the interior dividing walls where broken tegulae were used with their flanged sides showing on the face of the wall to imitate a brick course. A feature of special interest, which proved to be the only direct evidence of timber construction found, was the dividing wall between Rooms III and IV. Here the wall top was of hardened gravelly mortar with a thick edging of plaster rising on either edge, evidently to enclose a horizontally laid timber (pl. 1vb). It was not clear to which period this belonged, but it may well have been in use in both VI and VII. Very little can be said of the additional rooms at the south end as they were so thoroughly ruined by the later rebuilding that their footings could only be followed by the remains of the mortar used.

One important improvement was added to the house during this period, and

that was the insertion of a hypocaust in Room v, the room of the original house adjoining the cellar. As it was built on an unusual plan it must have been for some specialized use, but it had been much disturbed during the partial collapse and rebuilding of the cellar at a later date, so that its real purpose could not be definitely ascertained. From the slight evidence of two floor levels it may be suggested that it was some form of heating arrangement for corn drying (fig. 24, pl. 11b). The furnace mouth opened into the corridor and had been inserted through the wall of the earlier period, where the evidence was clear of the use of the two different kinds of mortar, the buff-coloured sandy mortar used in the furnace overlying the coarse orange pebbly mortar of the earlier wall. The hypocaust consisted of a central flue running three-quarters of the way down the centre of the room, with two side flues leaving the main flue halfway along and curving back to the corners of the room. The far end of the room was left without any such heating.

No floors of this period were found except for a thin spread of gravel in the corridor, but the presence of many scattered red brick tesserae all over the site does point to the use of floors of this make, a small loose fragment of mosaic with white, grey and red guilliche pattern being the only find of better quality flooring. That some of the tesserae were found in the make-up of the walls and fillings for the Period VIII house shows that floors of this type were in use earlier. It was also discovered that the tesserae were made from bricks as well as tegulae on the premises; for there were two lime slurries accompanied by heaps of brick chippings and piles of broken bricks which seem to have been brought to the workshop as the raw material. One lime slurry was placed in the corridor towards its southern end and is another indication that the corridor was used rather as a workshop and back premises than a true passage. Another form of flooring used consisted of small brick fragments set in thick mortar and then rubbed down to a flat surface, as large lumps of this type were found in the filling of Room XII.

An area roughly eighteen feet long outside the middle length of the corridor appeared to have been a yard floor; it was spread with a layer of buff-coloured mortar of this period. Part of the yard floor was still *in situ* above Rubbish Pits III and IV, as mentioned above. The latest sherds from the pits being dated to the middle of the second century, it is clear that the second phase of the house, which witnessed the addition of the corridor, etc., to the primitive villa, began at or soon after A.D. 150. A further point for dating comes from Rubbish Pit v in Room v, securely sealed by the hypocaust, which yielded the remains of two early second century pots, one being a decorated Samian bowl (fig. 14), which was old when put into the pit, because it had been riveted.

PERIOD VIII

The villa during its second phase seems to have lasted a considerable time, perhaps a century or more. But there appears to have been a great deal of decay during its latter years: it is even possible that it was deserted. This is suggested by the necessity for the wholesale rebuilding and alteration that took place in the next period, special points of collapse being noted in the cellar, involving part of Room v. The rebuilding took the form of completely levelling the block of rooms added at the south end of the corridor and erecting in their place two smaller rooms each with a heating system. Another room was filled with building rubble consisting

of large quantities of thick mortar; where this had subsided towards the centre of the room, further levelling up was done with a layer of gravel. This area now became a yard. Other portions of the last period house were also filled in with building debris of broken bricks, tiles, sherds and dark earth to a new floor level, but no floor of the period was actually found. A large new room (Room xi) was built into the centre of the corridor and across the west wall of the latter. The three smaller rooms (Rooms ii, iii, and iv) of the original house were made into one, the dividing walls being discarded and another wall inserted in Room i, perhaps to make this room correspond in size to the new one in the corridor. A trench dug through Room i parallel to the inserted wall, and then filled in with white lime building debris and gravel, showed a change of plan, but was an excellent example of the method used for building foundations in clean cut, vertical-sided trenches.

The type of building had degenerated, uncoursed flints being used in walls, which were wider than those on which they were super-imposed. There were no brick quoins, and the mortar, used very liberally, was white in colour. The new room in the corridor, Room xi, was heated by a double T-shaped hypocaust (pl. va and b) with the stoke-hole outside the house in a pit cut into the yard floor. The furnace had a round-headed brick arch which was found in ruins and had several coats of colour wash on its outer face, the last coat being white. The flues were deep and narrow, built mostly of flint but with brick corners, and in some places broken bricks were used set at a pitched angle. The first pair of branching flues were built on the line of the corridor wall, though the latter had been taken down and rebuilt. A T-shaped smoke outlet (pl. via) was placed at the end of the north-east arm of the eastern pair of flues and opened into the corridor. To accommodate this addition an extra width of wall was built outside the north wall of the room. Another smoke outlet had been left at the end of the south-west arm of the western pair of flues.

The cellar, though still considered an important part of the house, had become much ruined. The eastern half of its south wall had collapsed, probably bringing down part of the north-east corner of Room v. It was clear that the recess with its thin back wall was too weak to support much weight, and as a result the arched head was pressed out of alignment and cracks in the wall occurred. In the rebuilding, the ruined cellar wall was renewed from its foundation from the east as far as the recess, which later was filled in and blocked. The type of building was of a very rough nature; huge blocks of flint (pl. viia) were used with a liberal quantity of very white mortar, containing much lime. At one point in the lower part of the wall a timber had been used and sealed with a facing of plaster and broken bricks. Two large holes in the floor by the newly rebuilt wall showed the use of large scaffolding.

The cellar entrance was repaired, new door jambs being added of flints with some brick courses. The staircase was altered and instead of leaving by a straight flight of steps, the stairway led up by means of a turn into the corridor on the south. Two large slots (pl. ivb) were found in the gravel at the south side of the staircase well which showed the position for sloping timbers and below were the remains of a low wall which had supported them. The western corridor wall beside the staircase well now needed reinforcement, and a length of wall of flints with brick bonding was inserted into the eastern half of the original corridor wall (fig. 5,



A



B

PARK STREET VILLA :

- A. GENERAL VIEW OF VILLA, LOOKING N. ALONG THE CORRIDOR
B. CHALK FLOOR I. POST-HOLES IN NW. AND NE. CORNERS OF FLOOR



A



B

PARK STREET VILLA :

A. THE CELLAR FROM E. ENTRANCE

B. HYPOCAUST OF ROOM V. FURNACE AND STOKING PIT IN RIGHT-HAND FOREGROUND. CURVING ARM OF N. FLUE AT LEFT-HAND FOREGROUND. FOUNDATION OF FIRST FLOOR OF CORN DRYING ROOM RIGHT OF RANGING POLE WITH SECOND FLOOR LEVEL ABOVE



A



B

PARK STREET VILLA :

- A. LIME SLURRY NO. I. HEAP OF BRICK CHIPS ON FAR SIDE OF SLURRY. BROKEN TILES AND BRICKS ON LEFT AND IN FOREGROUND
- B. REINFORCED PORTION OF CORRIDOR WALL AT STAIRCASE WELL. BASE OF WINDOW WITH SLOPING SILL SET INTO WALL



A



B

PARK STREET VILLA :

- A. LOOKING DOWN INTO STAIRCASE WELL. BASE OF BLOCKED ENTRANCE INTO CELLAR AT TOP OF PHOTO. SLOTS FOR HORIZONTAL BEAMS ON EITHER SIDE OF RANGING POLE
- B. SLOTS ON S. SIDE OF STAIRCASE WELL FOR USE OF SLOPING TIMBERS FOR STAIRWAY. THE RANGING POLE IS LYING IN HORIZONTAL BEAM SLOT, REMAINS OF STONE SUPPORT BEHIND



A



B

PARK STREET VILLA :

- A. THE T-SHAPED HYPOCAUST CHANNELS IN ROOM XI. FURNACE AND
STOKING PIT OUTSIDE PHOTO ON LEFT-HAND SIDE
B. CENTRAL CHANNEL OF HYPOCAUST IN ROOM XI



A



B



C

PARK STREET VILLA :

- A. T-SHAPED SMOKE OUTLET OF NE. CHANNEL OF HYPOCAUST IN ROOM XI
- B. SURFACE OF N. WALL OF ROOM III SHOWING BEDDING FOR HORIZONTAL BEAM WITH PLASTER EDGING
- C. THE W. CHANNEL OF HYPOCAUST OF ROOM XIV SHOWING USE OF IMBRICES AS SUPPORTS FOR COVER. IMBREX *in situ* IN FOREGROUND



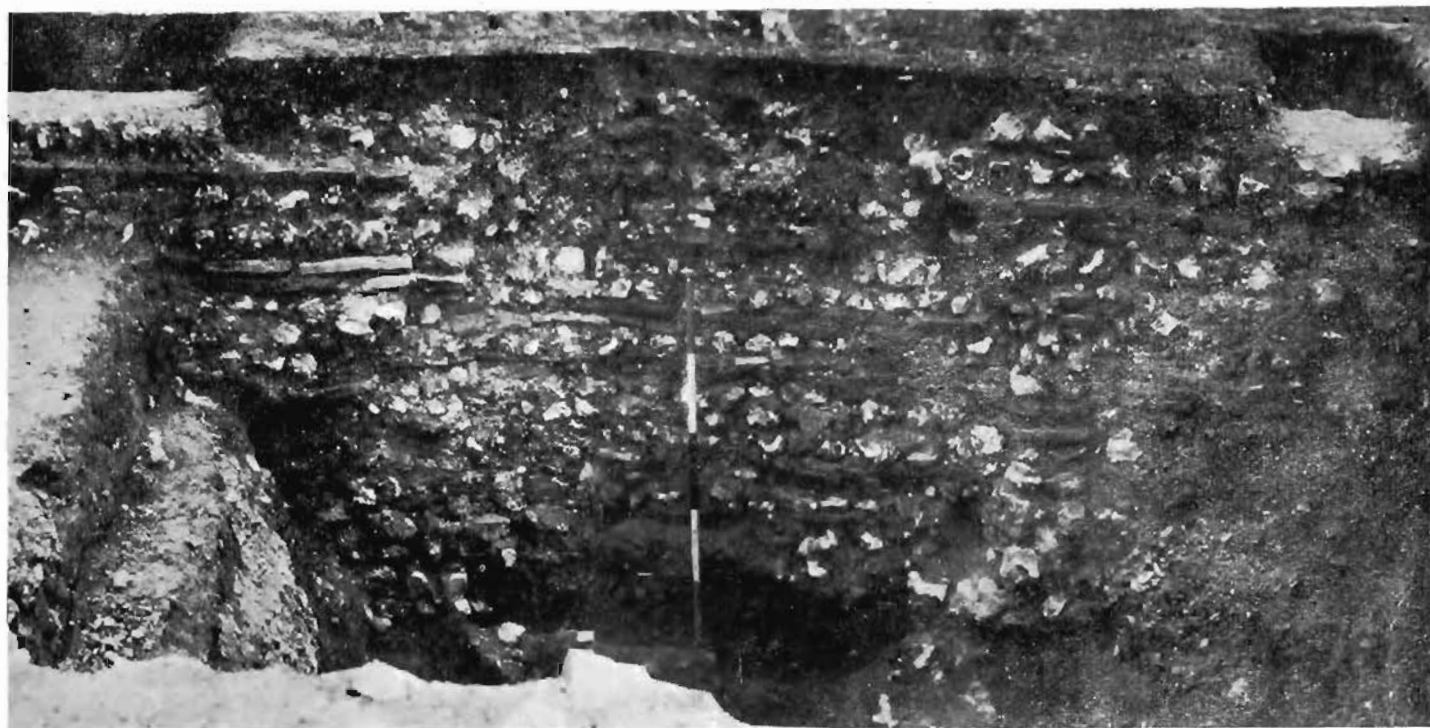
A



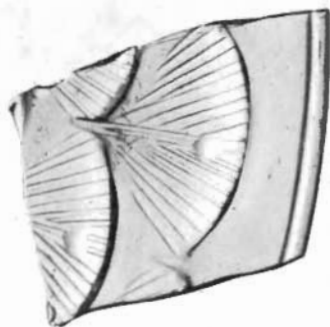
B

PARK STREET VILLA :

- A. THE CELLAR, SHOWING REBUILT PORTION OF S. WALL ON LEFT-HAND SIDE
OF RANGING POLE. ONE SCAFFOLD POST-HOLE IN FLOOR
- B. THE BLOCKING WALL AT W. END OF CELLAR



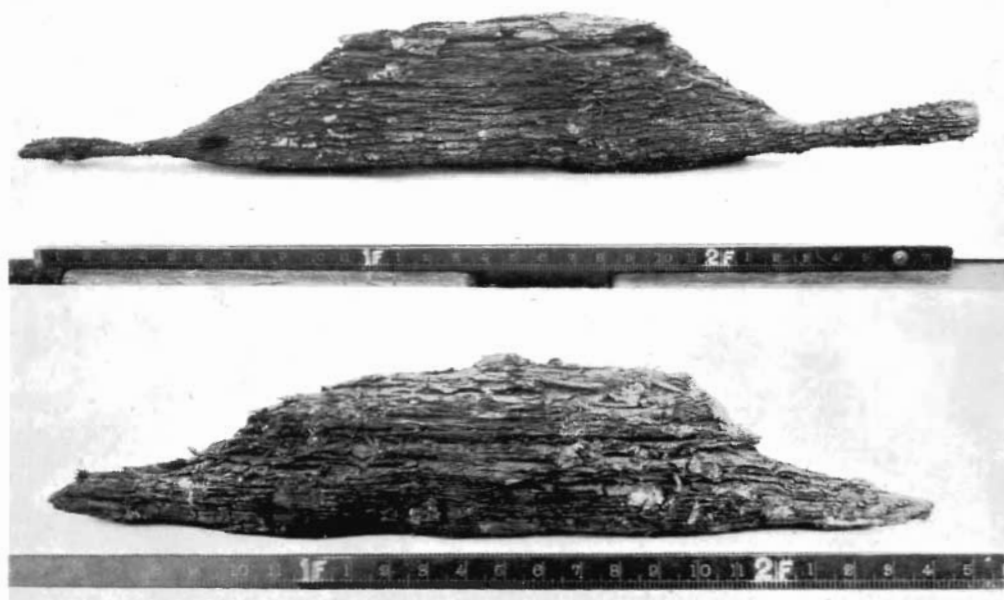
PARK STREET VILLA :
THE BLOCKING WALL OF CELLAR FROM THE STAIRCASE WELL SIDE



A



B



C

PARK STREET VILLA :

- A. ALEXANDRIAN GLASS (p. 70) $\frac{1}{2}$
- B. RECESS IN S. WALL OF CELLAR AFTER CLEARANCE
- C. OAK TIMBERS FROM FRAMEWORK AT BOTTOM OF WELL

Section G-G, and pl. iib). The remains of the base of a small window was found in the reinforced wall, evidently to light the staircase well.

The evidence for the date of this rebuilding was not abundant since it consists only of a little coarse pottery associated with the building of Room xi. It contains nothing certainly of the fourth century, although it includes some of the third. Since many of the buildings of Verulamium show evidence of rebuilding and a new prosperity early in the fourth century, it is probable that the rebuilding of the Park Street house is another manifestation of the Constantinian revival.

PERIOD IX

For some unknown reason it was considered necessary to stop up the western entrance into the cellar. A blocking wall (pl. viib) was built and the staircase well filled up with rubbish. The only entrance to the cellar then lay at the eastern end, but beyond slight signs of additional walls suggesting a small courtyard with perhaps a ramp leading down to it, all evidence here was destroyed by the gravel digging. The blocking wall was of flints with irregular bonding courses of bricks and an occasional chalk block or pebble set in at the back in a yellow sandy mortar. There was only a face to the wall in the interior of the cellar, as on the other (western) side the wall (pl. viii) was roughly built up against the rubbish which must have been deposited at the same time. The rubbish contained much building debris, especially roofing materials and there were also layers of burnt deposits which contained many sherds and a few coins. The sherds date from the first half of the fourth century, the evidence on the whole being that the rubbish was deposited all at once about the middle of that century, because sherds of the same vessels were found in both upper and lower layers. The coin evidence from the rubbish, comprising seven radiates and a silver coin of Constantine I of c. A.D. 320 in fair condition, agrees with that of the pottery. Some of the building debris in the filling may have come from Room v which was levelled and refloored at this time. A mid-fourth century Castor ware box found in the levelled debris in the centre flue of the room assists the dating.

THE END

The end of the villa soon followed. The cellar was certainly burnt out, and collapsed then or soon after. No signs of burning were found elsewhere in the villa, except in Room v, but since it seems probable that the main purpose of the establishment was agricultural, the cellar being the store house for grain, with the latter in ruins there can have been little use for the rest of the house. A large deposit of burnt material was found on the floor of the cellar, some of which contained the charred remains of wheat and barley. This layer also contained six coins of the mid-fourth century, the latest being probably of c. 360 or a little later. On the black layer which also showed charred beams, rested a layer of roofing tiles, smashed into small fragments, above which lay mortar, plaster and finally the flints from the walls. In these layers there were two more coins of the same period. Moreover, of the sixty-nine Roman coins found during the excavation, no less than fifty-two are of the middle decades of the fourth century and thirty-two in all are of the type of legionary spearing fallen horseman, which was issued from the year 348 onwards

until the year 361. Some of the examples found are barbarous copies, but most are official issues. No later coins were found. The emperors Valentinian I and Valens began to reign in 364. Their coins are excessively common in Britain. Had the villa continued to exist for more than a very few years during their reign, some of their coins must have been found in its ruins. It is, therefore, legitimate in this case to use the negative argument, that, since no coins of a reign beginning in 364 were found, the site must have been deserted by or soon after that date. When it is recollected that barbarian raids culminated in an overwhelming disaster to the Province in A.D. 367 and 368, one is led irresistibly to the conclusion that this villa was destroyed during the time of those troubles.

This, however, was not the last time that the cellar suffered from barbarian raids, as during its excavation in the spring of 1944 German raiders dropped two incendiary bombs into the now roofless room, burning some of the flints in the blocking wall to a brilliant pale blue.

The most important results of this excavation have been these: there is evidence for continuous habitation on the site for about 350 years, even if the pre-Belgic finds are left out of account, and at all times one particular spot, Room v of the Roman house, seems to have been of special importance. The quick succession of Belgic periods may seem peculiar, but is paralleled at Colchester and to a less extent at Lockleys. Chalk Floor II is of particular significance, as apparently the first example recognized of a substantial hut floor in pre-conquest Belgic times. The iron slave-chain from Belgic Pit II, although not the most well-preserved of its kind, is a rarity as a manacle rather than a neck shackle, and is more closely dateable than most other examples. The presence of flint implements alongside iron nails in Period IV (pre-Roman) deserves emphasis, as does the rectangular form of the hut-floors of chalk and of clay, although none of these features need occasion surprise. The small change in the character of the house during the first two decades of Roman rule is interesting, especially as it confirms Mr. J. B. Ward Perkins's conclusions at Lockleys.¹

The likeness of the first stone house to that at Lockleys is most marked both in plan and in date, although the cellar at Park Street is a notable addition to the plan and the evidence of dating is even more meagre at Park Street than at Lockleys. At least it is clear that two Roman houses in Hertfordshire were built in stone within a few decades of the Roman conquest, but that they did not have a stone built corridor until the middle of the second century A.D. The similarity of these two houses makes it most desirable that a third should be scientifically excavated, particularly to its lowest levels, as soon as excavators and funds are available from more urgent tasks elsewhere.

Finally, the end of the house is most interesting. The coin evidence has been used to attribute this definitely to A.D. 367-8. Very often in the past it has been said that many Roman houses must have perished in those years, because the coin series from their sites ends with issues of Valentinian I or Valens. But at Park Street destruction in A.D. 367-8 is argued from a complete absence of such issues. Surely in future their presence on a site should indicate that it escaped destruction at that time.

¹ *Antiq. Journ.*, xviii, (1939), 344.

PART II: DETAILED REPORT

PERIOD I: EARLY BRONZE AGE

A shallow pit of irregular oval shape was found, dug almost vertically into the natural gravel; its floor was four feet below present ground level and twelve inches below the Belgic level of occupation (Pit 2, fig. 2, fig. 4, Section A-A). The orientation of the pit was SW. to NE., its SW. end being the broader, where also there was a peculiar angle in the outline. The pit sloped slightly to its narrower end, where it had been deepened by another twelve inches, to form a subsidiary oval hollow, measuring four feet in length and three feet six inches in width. The total measurement of the pit was eight feet in length and four feet six inches in greatest width. A post-hole was found near each end, both having a diameter of nine inches and a depth of seven to eight inches. The filling of the pit and the two post-holes consisted of a coarse gravel mixed with a grey clay silt, but where the gravel was of a finer quality it was of a clean washed nature. The latter type of filling was very noticeable in section as a tip in the filling over the NW. edge of the subsidiary oval hollow. From this tip one sherd of a Food-Vessel was recovered. Mr. W. F. Grimes, to whom the sherd was submitted, states that it comes from a small hand-made pot of thin brown ware, decorated all over the outer face and some little way down the inner face, where it is bounded by a horizontal incised line. The ornament consists of horizontal lines of fairly closely set vertical impressions, which are slightly curved and segmented like maggot pattern. The impressions appear to have been done with a cockle or similar shell which suggests a Food Vessel.

PERIOD II: EARLY IRON AGE A

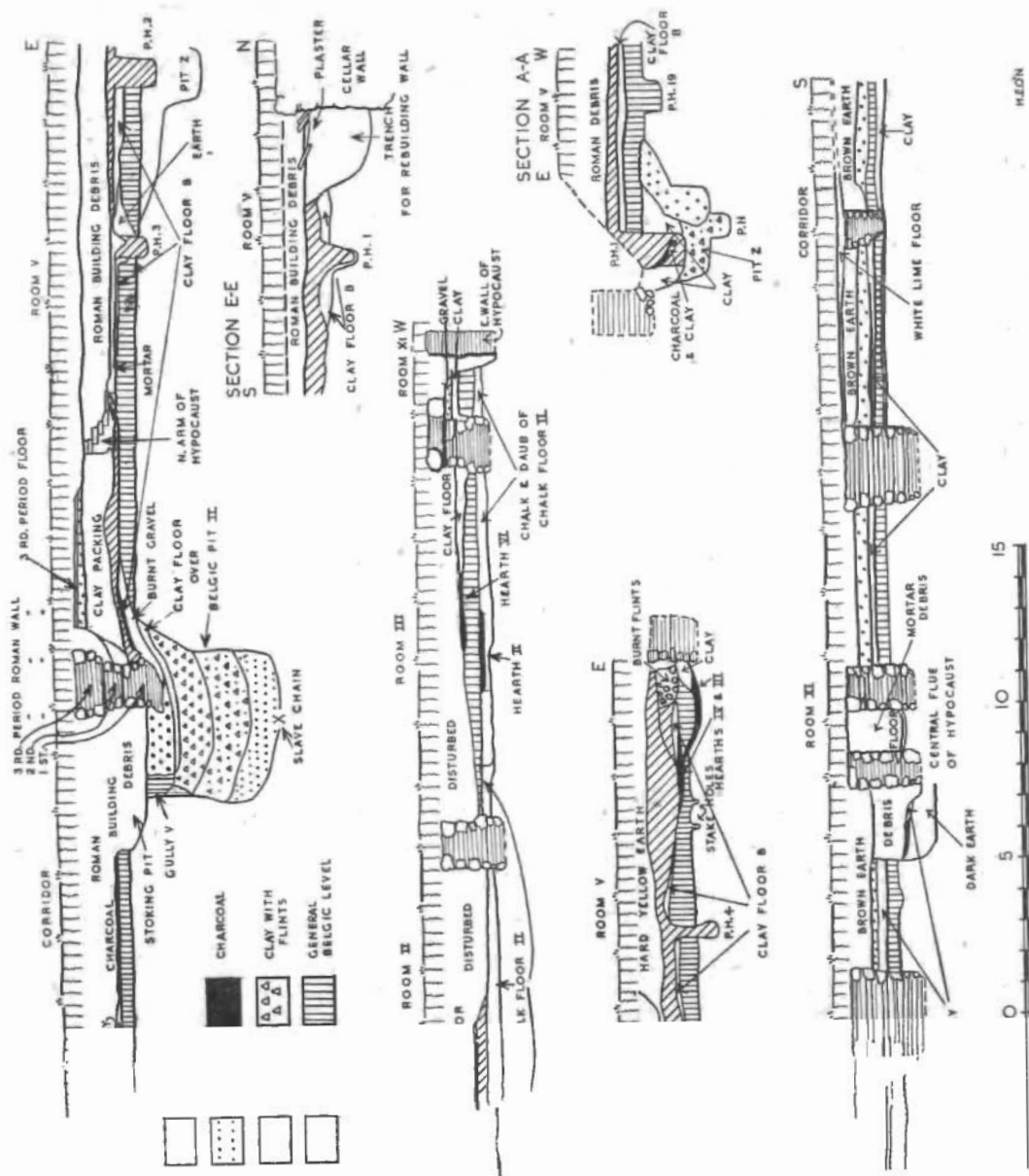
This period is represented by the find of a group of large sherds of Early Iron Age A type in the main flue of the hypocaust system of Room XIV of the Roman house (p. 73, fig. 12). Although the find does not prove an occupation on this exact spot, it seems permissible to suggest that a settlement of this date (c. second century B.C.) existed somewhere close at hand. In spite of a close watch on the operations of the mechanical grab no signs of a site were noted.

PERIODS III, IV, V: BELGIC IRON AGE

The Belgic occupation of the site was concentrated in area and time; from the evidence recovered there appear to have been three successive periods, here numbered III, IV, V. The main occupation layer consisted of a band of dark grey clay, averaging five inches in thickness, lying consistently eighteen to twenty inches below present ground level. This band, containing small scattered lumps of chalk, pieces of red and black daub, flint flakes, fragments of bone, charcoal and many sherds, was named the General Belgic Level. It was most notable that this General Belgic Level was found only below the area afterwards used by the first Roman builders. It was not seen elsewhere, as sections cut by the various activities of the mechanical grab around the site were examined and no further Belgic occupation was discovered. The greatest concentration of the Belgic occupation appeared beneath Room V of the Villa to follow, and here it may be stated that it was at this portion of the site that the greatest complications of the excavation occurred, involving seven periods (fig. 4, section B-B) in one small room (i.e. one Early Bronze Age, three Belgic, three Roman). This attraction of a small area emphasizes its advantageous position, and suggests that the Belgic family clung to its ancestral homeland in spite of drastic changes around it, merely absorbing the new fashions and inventions as they came along.

PERIOD III: *Gullies I, 1a, II, IV*

Period III, the first of the three Belgic periods, is attested by evidence of rather a slight character, the Gullies I, 1a, II, and IV (fig. 2). Gullies I and 1a were shallow and irregular in shape, and their bases lay three feet below present ground level, the gullies themselves being six to nine inches in depth. They appeared to be mere scoops in the natural clay and were filled with dark grey clay, part of the General Belgic Level, containing



scraps of blackened bone, flecks of charcoal and a few minute abraded scraps of Belgic pottery. Portions of chalk floors, to be mentioned later, overlay Gully I at two points. It had largely silted up before the chalk floors were placed over it. What Gullies I and 1A represented could not be fully worked out, as the area of the continuation of the latter had been disturbed by the building of Room XI and the insertion of its hypocaust flues during the later Roman occupation.

Gullies II and IV (fig. 2) were irregular, narrow V-shaped trenches, varying from six to nine inches in width and from four to eight inches in depth below the top of the natural clay. In section they were well made and showed up clearly by the difference of the colouring of their filling from the natural clay. The two gullies ran almost parallel, two feet three inches apart, converging to one foot three inches, but both ends had been truncated, at one end by the east wall of Room V and at the other by the cutting of Rubbish Pit V and Belgic Pit I. The filling of the gullies was of a soft brownish clay, containing flecks of red and black daub. Gully IV, however, in addition to the above filling had fragments of chalk and a lot of small calcined flints in the lower levels of its filling, as well as a greater sprinkling of charcoal on its top filling. The only use that can be suggested for these gullies is that they were drainage channels.

The thirteen small, round post- or stake-holes, from two to three inches in diameter and three inches in depth near Gullies II and IV resemble those beside Hearth II, which are described below (p. 34). Like the gullies, they are dug into the natural subsoil and they were never visible until all accumulation had been removed from its surface. They in no way conflict with the gullies and one of them seemed to be partly under a Hearth (no. IV) of the next period. Their purpose is quite unknown, but on the slight evidence already quoted they may tentatively be included in Period III.

The only pieces of dating evidence for this period are the few sherds found in the filling of Gully I, which are too abraded to be illustrated. They resemble pottery found at Prae Wood (Verulamium) in the general series of A.D. 10-40. With the gullies they indicate occupation early in the first century, but its pattern is a matter of guesswork.

PERIOD IV: BELGIC. *Chalk Floor II with Hearths I and II*
Floor A with Hearths III and IV
General Belgic Level. Belgic Pit II

Period IV was represented by the remains of a rammed chalk floor (Chalk Floor II, fig. 2 and fig. 4, section C-C), the only intact portion of which lay under Room II of the later Roman house. The floor was composed of small lumps of chalk, roughly the size of a small hen's egg, with the addition of an occasional small flint. The whole was rammed tightly to make a smooth surface. It lay two feet from modern ground level, and probably covered an area twenty-six feet long by ten to twelve feet in breadth. It was difficult to determine its actual edge except in a few places on account of various later disturbances. It ran beneath the east wall of Room II for six inches, reappearing the other side and continuing for another twelve inches, where rounded corners some eight feet apart appeared to show its end in this direction. The disappearance of the chalk directly under the centre of the east wall was due to the insertion of the deepest part of the foundation of the Roman wall. Embedded in the chalk floor under the west side of Room II was a round hearth (Hearth I: fig. 2) with a diameter of two feet three inches. It was made up of flints and river pebbles which had been burnt to a dark purple colour; the natural clay below was burnt bright red to a depth of one and a half inches. The chalk floor continued under Room III, but here became of a more indefinite character, with the chalk thinning out and in some parts becoming merely a scatter mixed in with the grey clay of the General Belgic Level. Two portions of the floor, however, each six inches thick, still *in situ* in Room 1A, showed that the floor continued in this direction. One of the portions of floor overlay Gully I, already partly silted up, as mentioned above (p. 33). The floor ran to and just beyond the west wall of Room III, some of the chalk being beneath the offset of the Roman wall there. A fairly definite edge was encountered on its north side as the floor reached this west wall, and its north-west return appeared just outside the west wall. The remains of another hearth (Hearth II: fig. 2) were found about four feet west of Hearth I. The hearth

consisted of dark red burnt earth with a little chalk mixed in as well as below the burnt earth. Sherds of furrowed Belgic ware were found in the burnt matter. Close to the western side of the hearth a bronze coin of Cunobelin was found and within a few inches a bronze brooch (fig. 8, 1) of the so-called 'poor-man's' type. They lay in the lowest part of the General Belgic Level, which has already been described. It was quite clear that this thick level is the product of continued occupation around several hearths, which occur within it at different points. At the point now being described the two hearths appear to belong to one chalk floor. Their mutual relationship in time could not be determined, but they are unlikely to have been in use simultaneously. The level hereabouts, beside the coin and brooch, contained sherds of furrowed Belgic ware, a spindle-whorl made from a furrowed sherd, flint flakes, bone chips, a few oyster shells and some iron nails.

Many small post-holes, nearly all with a diameter of three inches and a depth of three inches, were found scattered about, sunk into the natural clay under the western half of Room III. They appeared to be holes for stakes, but their pattern did not present any intelligible plan. That they belonged to Period IV was suggested by their filling, which consisted of the grey clay of the General Belgic Level, usually containing some lumps of the chalk, as if the latter had been driven in when the stakes were inserted through a chalk floor. Two of the holes, amongst the group of six just west of Hearth II, contained fragments of molten lead. The larger post-holes, nos. 10 (6 inches deep) and 20 (9 inches deep) belong to this or the previous period, since they did not become visible until the General Belgic Level had been removed, but their purpose is unknown. No. 34 (8 inches deep) also cannot be explained, although it had much chalk in its filling.

The rectangular form given, rather arbitrarily and with slight evidence, to Chalk Floor II on the plan, is done with the knowledge gained from the find of Chalk Floor I, which had a very definite rectangular form (fig. 2, pl. 1b), and which, although belonging to the succeeding occupation, suggests that its predecessor may have been similar in form.

Floor A, with Hearths III and IV

The General Belgic Level extended northward from Chalk Floor II, running under Rooms IV and V of the later house. It covered the Bronze Age Pit 2, as well as Gullies II and IV and the stake-holes in Room V. This accumulation must have been due to the presence of another hut floor, Floor A, which is attested by two hearths and a number of post-holes (fig. 2). Post-hole no. 26, oval in shape, was dug to a depth of five inches into the subsoil, here gravel, on the south-west and to a similar depth into the filling of the Bronze Age Pit on its north-eastern side. Above this it had been dug through five inches of the General Belgic Level, but was entirely sealed by the clay floor and Hearth V of Floor B. It clearly therefore belongs to the latter part of Period IV. Post-hole no. 19 was also sealed by the same clay floor, was dug into the subsoil to a depth of nine inches and was filled with the General Belgic Level. Post-holes nos. 9, 10, and 22 were for various reasons only located on the surface of the subsoil, but they can hardly be attributed to Period III without definite evidence, since that Period showed no proved post-holes, nor to Period V, in which the post-holes had distinctive fillings. By a process of elimination therefore, they have been put into Period IV. Two hearths belong to this Period, Hearths III and IV. Both were sealed by Clay Floor B of Period V. Hearth III, the earlier of the two, was in such a position that Gully IV must have been filled and abandoned before the hearth was used. This hearth was of an unusual type. It had a diameter of two feet three inches, and was bowl-shaped (fig. 4, Section D-D) its bottom being sunk into the natural clay to a depth of six inches. There was a thick deposit of charcoal and black ash on the bottom, and the clay all round its edge was burnt bright red. It must have been below the level of the floor of the hut when in use, but this may have been found convenient if its use had been that of an oven and the fuel charcoal. A second circular hearth, Hearth IV, on a higher level and partly overlapping the western edge of the earlier hearth, had a diameter of two feet six inches and was flat. It was covered by dark burnt debris with remains of charcoal. No finds were made on this hearth, but a chip of rouletted butt beaker, a good wheel-made grey rim, and some animal bones were found on the bottom of the earlier hearth. The sherds are probably of pre-conquest date.

If the post-holes nos. 9, 10, 19, 22 and 26 have all been correctly placed in this period, they may perhaps be looked upon as forming part of a circular or oval hut, of which no. 26 held the central post. If so, it would presumably be equated with the latter part of the General Belgic Level, since no. 26 was partly dug through it. Hearth IV may belong to this hut, Hearth III being part of an earlier hut, of which there are no other traces.

The General Belgic Level was found also under the area occupied by the corridor of the villa, but so much of this had been seriously disturbed by the later Roman alterations, that no further hut floors could be traced. The only finds from the corridor area were many sherds of Belgic ware, one being perhaps the earliest Belgic sherd on the site (fig. 15, 20).

Belgic Pit II

To Period IV belongs also Belgic Pit II (fig. 2). It was sealed by the Clay Floor B of the succeeding Period V, but not by the General Belgic Level, which occurs not far away, and which would undoubtedly have covered the pit or sunk down into it, had the latter belonged to any earlier period. The pit was large and rather kidney-shaped and measured seven feet six inches long, five feet nine inches wide and five feet deep below natural gravel, into which it was dug. It had vertical sides except on its west face, where it was slightly undercut. There were three distinct fillings, all of which contained sherds of Belgic and very early Roman date.

Resting on the natural gravel below the lowest filling the remarkable find of an iron slave chain occurred (fig. 9). It consisted of one manacle attached to a chain of thirty-seven links, measuring about three feet four inches in all, lying in a corroded heap. On the same level as the chain there were sherds of what appears to be a pedestal urn of the early first century A.D. (fig. 15, 7). The bottom filling (above these finds) was of a fine grey clay, apparently silt washed in soon after the pit was dug. The silt was twelve inches thick and contained many fragments of Samian platters, forms 15/17 and 18, all of Claudian date but unlikely to have been imported before the Conquest of A.D. 43 (fig. 15, 1, 2, 3). A filling, fifteen inches thick, composed of gravel intermixed with grey clay, covered the silt; from this sherds of Samian platters, form 15/17 were recovered. Above this layer was another filling, twelve inches thick, of dark clay mixed with flints containing animal bones, small oyster shells, iron nails and many Claudian sherds (fig. 15, 5, 11, 15, 18, 19), and the remains of a rotary quern in Hertfordshire pudding stone (fig. 23, no. 6).

Three quarters of this pit was sealed by a layer of clean clay, which seems to have been deliberately laid. Beside the western edge of this layer of clay there was a rather indefinite gully (Gully v) dug into the top filling of the pit and filled with loose soil. This clay layer was itself partially covered by the Clay Floor B of the next period, but there was no sign of any occupation layer between the two. Nevertheless, the lower layer of clay may have formed the floor of a temporary shelter, perhaps for those who were preparing the hut of Clay Floor B, which later covered it (fig. 4, Section B-B).

The evidence for the date and duration of this period is as follows. Chalk Floor II of this period had under it a few indeterminate Belgic sherds, presumably of pre-Conquest date. At least there was nothing Roman there. Actually amongst the chalk there was again nothing Roman. All was miscellaneous Belgic of A.D. 10-40, i.e. as found at Prae Wood, including a finger-tip decorated jar and a corrugated shoulder of a dark grey soapy jar, which could be paralleled at Wheathampstead, but probably survived later. The coin of Cunobelin came from precisely this layer, just above the chalk floor, not on it. On, i.e. immediately over this chalk floor (really the bottom of the General Belgic Level), there was one small sherd of thin white ware, possibly from an early jug. This appears to be Roman, but it could have been a pre-conquest import. There is nothing else Roman in this collection, which is otherwise of miscellaneous Belgic wares, including furrowed ware. It seems reasonable to conclude that this Chalk Floor II was made and used before the Roman Conquest.

The General Belgic Level, which overlies Chalk Floor II and underlies Chalk Floor I, described below, contains predominantly Belgic wares, but the following Roman sherds

occur: a piece of Samian 18 from Room II and pieces of a buff jug from Room V, which could have been imported before the Conquest, but also a part of a Roman coarse grey jar from Room II and a small sherd of Roman pinkish-buff ware jug. These two last items are unlikely to have arrived before the Roman conquest, but, as they are the sole items of the kind from a considerable area cleared, it seems reasonable to interpret them as belonging to the end of a continuous occupation, which began before the conquest and did not end until after A.D. 43. The part of this layer directly under Chalk Floor I contained nothing Roman.

The Clay Floor B in Room V, described below, covers this General Belgic Level and also seals the filling of Belgic Pit II. These two latter are likely—but not certain—to be contemporary. The filling of Belgic Pit II dates from just about the time of the Roman conquest, with Samian sherds of forms 15/17 and 18, pointing to a general clearance of the site soon after A.D. 43. This precisely fits with the evidence of the General Belgic Level, with its two solitary Roman coarse sherds.

PERIOD V: BELGIC. *Clay Floor B. Belgic Pit I. Chalk Floor I*

To Period V, the third Belgic occupation, belonged a clay floor, Clay Floor B, with an accompanying rubbish pit, Belgic Pit I, both under Room V of the later house, and a well-made chalk floor, Chalk Floor I, which was found outside the south end of the first stone house (fig. 2, pl. 1b). Both these floors were placed upon the grey clay of the General Belgic Level, Clay Floor B, at one foot ten inches and Chalk Floor I, one foot three inches below modern ground level.

It was not possible to trace the full extent of Clay Floor B on account of later disturbances, such as the building of the flues of Room V, and the collapse of the cellar, which latter affected the northern edge of the floor. It probably once extended further north than is shown on the plan. This is indicated by the presence of a thick deposit of bright red daub, in some places two and three inches thick, which overlay the floor level. Apparently the daub had been part of the walls of the hut, was burnt in the latter's final destruction, thrown down and levelled during the erection of the stone house. The greatest depth of daub lay over the south-east quarter of the floor.

The floor itself was of hardened clay, although this condition was not found consistently all over. A noticeable feature during its excavation was the ease with which the fallen daub and other material came away, leaving the clay surface undisturbed. Unfortunately, the surface deteriorated quickly on being exposed to the air. A section dug through the floor showed that the clay forming the floor was of an uneven character, being thin in some places and as much as three inches thick in others. During a spell of dry weather the floor was very conspicuous in colour in the section. So far as could be ascertained the floor was oblong in plan lying east to west, twelve feet long by eleven feet wide with a narrow western extension ten feet long and six feet wide. Immediately south of this extension lay a rubbish pit, Belgic Pit I, which seems thus to have been outside the hut, but so closely associated with it as to suggest contemporary use. The only certain edge of the main floor was at its south-west corner just east of the rubbish pit. The eastern end of the floor had been destroyed by the east wall of Room V, while the western end of the narrower portion ran beneath the west wall of Room V as well as over the northern half of Belgic Pit II before coming to an end.

Of the many post-holes in Room V, some already associated by inference with other periods, only a few can be definitely assigned to any period by archaeological detail. These are nos. 1, 2, 3, 4 and 5, which belong to Period V. The proof is supplied by no. 4. In section it was shaped like a tall bottle or Indian club (fig. 4, Section D-D), its diameter at the base being seven inches. At its top, where it was seven inches narrowing to five inches in diameter, it showed clearly in the clay floor, but was sealed by the next layer above and it is certain that the clay floor was packed tightly round its post. Had it been earlier in date than the clay floor, the latter would have sealed its filling. Had it been later than the floor, it could not have been dug in the shape in which it was found without destroying a larger part of the floor than a hole with a diameter of five inches. The other four post-holes of the series supplied similar but not so convincing evidence of association

with the clay floor. They have been equated by the identical character of their filling. They were found packed full of daub and other burnt matter, the daub being similar to that found lying on the clay floor, its presence in the post-holes being due to the same circumstances as mentioned above, i.e. the destruction of the hut and the subsequent levelling of the site. Of the post-holes no. 1 was especially interesting (fig. 4, Section E-E), on account of the evidence showing that two posts had been inserted at different dates and that both had been set in at an angle. This was seen by the two bases at the bottom of the hole, one being slightly higher than the other (but on plan (fig. 2) appear side by side) and partly undercutting the vertical north side of the hole. The timbers used were of a size about six by four inches and the depth of the hole was fourteen inches from its floor level. The eastern hole-base was filled with charcoal and was sealed down by a thin layer of clay when the later post was inserted above. In a section of the hole, the clay was also seen as a thin line running down the south side of the hole, clearly showing that some of the clay from the floor above got rammed in along with the later post. There was charcoal in the bottom of the later hole-base as well, and the rest of the filling of the hole was of red daub. From the latter a sherd of Samian, form 29, was recovered (fig. 13, no. 2). The somewhat larger size of the top of the post-hole compared with the others also shows its re-use.

Post-hole no. 2 tended to be rectangular in form and was sixteen inches deep. Nos. 3, 4, 5 were round and smaller in diameter and were respectively fourteen, eighteen and sixteen inches in depth. No. 4 contained an iron nail, some indeterminate Belgic sherds and some brick chips in its daub filling: its shape has already been mentioned. Owing to the removal of the upper layers certain other post-holes in this Room can only be attributed to a Period by their filling. Of these nos. 20, 21, 11, 12, 13, 14 and 18 contained red daub. It occurred only for an inch or two in the top of the filling, but, since the upper layers had disappeared, this inch or two actually lay at the same relative level as the bottom of the red daub in post-holes nos. 1, 2, 3, 4 and 5. Tentatively, therefore, all these seven other post-holes are placed in Period V, although their full meaning is not understood.

Gully III could not be fully explored because it ran almost directly under the South wall of Room v. Its course beside post-holes nos. 11, 8, 12, 13 and 14 suggests that it is contemporary with them. Post-hole no. 8 had no red daub in its filling, but seems to belong to this series.

Another circular hearth, *Hearth v*, was found on the floor of this period, close to, although at a higher level than *Hearths III* and *IV*. It had a diameter of two feet six inches and consisted of charcoal and much burnt material on and incorporated in the clay floor of the hut. A thick covering of red daub lay over it which in hardness was quite brick-like. It is of some significance that these three hearths, at different levels and belonging to different periods, should be placed close together; it suggests that this position was the centre of the successive huts.

Belgic Pit 1

A rubbish pit, *Belgic Pit 1*, four feet wide and four feet nine inches long was found close to the south-west quarter of *Clay Floor B*. It was two feet deep from hut floor level and four feet six inches from present ground level. It was well formed and cut into the natural clay, with vertical sides on the north and east, the sides abutting on the hut, but sloping on its other two faces. The bottom of the pit was filled with a layer, an inch thick, of charcoal, with a deep deposit above of bright red daub, much of which was in large lumps, containing many impressions of the wattle as well as grass. Some of the impressions showed that the wattles were an inch in diameter. Lying on the daub and across the southern half of the pit was a layer of chalk, composed of small lumps similar in character to the material of the chalk floor described above. This layer was six inches thick towards the western side of the pit and, where it actually reached the edge, ended with two large blocks of chalk. The chalk must have been part of the material of a floor, which was swept in on top of the daub, when the pit was filled up and went out of use. Sherds from three early post-conquest vessels were found in the daub filling in the pit below the chalk layer (fig. 15, nos. 21, 22, 24).

Chalk Floor 1

The remains of a well-made chalk floor, Chalk Floor 1, found just south of the first stone house belongs to this period (plate 1b). It is a remarkable fact that this floor, only fifteen inches below modern ground level, should have survived, although truncated, and that the small piece of ground, only some six feet in width, lying between two sets of buildings of the later villa, should never have been made use of other than perhaps as a pathway. A portion of the floor had plainly been cut off along its south side, where a robber's trench was found right across it. The remaining portion of floor measured fourteen feet six inches long and was five feet six inches wide. It was composed of small lumps of chalk, tightly rammed together, forming a very fine floor. The actual surface was still intact in a few places towards the centre, and showed that it was a most attractive type of flooring. It varied in depth, from three and a half to six inches, and lay on the grey clay of the General Belgic Level. A pale grey deposit of fine earth lay all over the chalk to a depth of two to four inches; this was puzzling at first but Professor F. E. Zeuner states that it can be accounted for by the natural weathering of the chalk. The remains of a hearth in the middle of the floor was found, with a deposit of black ash and red daub placed in a scoop made in the chalk. The actual material of the hearth was mounded up with the accumulation of ashes over the scoop, but the latter may have been formed merely by the poking of the fire. Fragments of Belgic bricks and a piece of a grey Roman lid were amongst the ashes from the hearth (fig. 15, no. 23). The north-west and north-east corners of the floor remained intact, and the presence of daub and burnt earth outside the hut showed the type of material used for the walls. A rectangular post-hole was found near each corner: they were easily distinguished in the floor after the removal of the pale grey earth. They were extremely well made, with sharply formed corners, and were filled with a brown clay mixed with charcoal. The north-west post-hole measured twelve by nine inches and the charcoal remains of a beam were lying across its top. A minute Belgic sherd was found in the filling. The north-east post-hole measured twelve by eleven inches; it had the same type of filling but with less charcoal and contained in addition some animal bones. The depth of the post-holes was not more than the thickness of the floor, as the General Belgic Level which was immediately below did not show any disturbance for the insertion of the posts. It appears, therefore, that the post-holes were sockets for a bench, rather than holes supporting timbers to carry a great weight.

The chronological evidence for this period is as follows. The General Belgic Level beneath Chalk Floor 1 yielded nothing Roman. The filling of the post-holes of this floor had one indeterminate Belgic sherd, but the grey soil on its surface had a definitely Roman coarse grey lid and a few other early Roman coarse sherds. The sherds are still predominantly Belgic, but, as the floor was clearly used after the Roman conquest, and as appearances suggest that it actually saw but little use, it is probable that it was not laid down until after A.D. 43.

The sherds associated with Clay Floor B, which seals Belgic Pit II, and can, therefore, hardly be of pre-conquest construction, are few and nearly all indeterminate Belgic. The only exceptions are a possibly Roman sherd of buff ware from in the red layer over the floor and the chip of decorated Samian (fig. 13, no. 2: A.D. 40-50) in Post-hole 1. This last was mixed with burnt daub and seems to have been swept into the hole, when the hut was destroyed and levelled, but it is reasonable to link it with the occupation of Clay Floor B. Belgic Pit 1 filling contained only Belgic wares (fig. 15, nos. 21, 22, 24), and pieces of three pre-conquest vessels. The pit probably belongs to the period of Clay Floor B, but this cannot be proved. It was, however, open when the floor was disused, because it contained much burnt daub, such as occurred all over that floor.

PERIOD VI: ROMAN

First stone house. Rooms I, II, III, IV, V and Cellar

A special study of the mortars used for the various periods of Roman building was carried out by Dr. Norman Davey, whose report follows in an appendix. His study was carried out independently of the excavator's observations of the types of walling,

on which the chronology of the villa was first built. It is interesting to record that the conclusions of both methods were in agreement.

The first stone house consisted of five rooms (numbered Rooms I, II, III, IV, V on plan) and a cellar, laid out on a simple rectangular plan running north to south, covering an area of sixty-six feet by twenty-three feet (fig. 3; pl. 1a). It is not possible to say whether the house faced east or west, as no doorways were found, but from the position of the rubbish pits to the west of the site it seems highly probable that it faced east. The well lay east of the house and may have been in an entrance courtyard which once existed in the area destroyed by gravel digging before excavation began.

The type of masonry used was excellent and consisted of flints bedded in a coarse, pebbly, orange-coloured mortar with well laid brick quoins. The walls, eighteen inches in width, sometimes still stood eighteen inches to two feet in height. In some places the walls had an offset, but this was an irregular feature, and in one case (S. wall of Room I) the alignment of the lower part of the wall was at variance with the upper, so that an offset could be seen on the outer face of the wall, to disappear and then to reappear as an offset on the inner face of the wall. There were four courses of flint, the two lower courses bedded in clay and trench-built and the two upper courses in mortar. The flints used were of a moderate size, but long 'sausage-shaped' ones¹ were placed at intervals and made an excellent bond. The stability of the walls was tested when it became necessary to remove portions to recover the Belgic evidence below, when it needed the utmost exertion of human strength and pickaxe to remove them. It was also noticeable that, although exposed to severe wintry conditions, the mortar remained sound throughout the excavation. It was difficult to decide whether the house was a single or double storied building, but probably it was the latter, on account of the width and substantial build of the walls. There was however no lack of evidence of the roofing material, as enormous quantities of broken tegulae and imbrices were found. The comparative scarcity of flints in the fallen debris suggests that the main walls as well as partitions were in half-timbered style above the lower courses. The floor of this period was a laid deposit of yellowish sandy clay. It occurred consistently in the rooms of this period, except where later disturbed, but in no other rooms.

Room I

The room measured internally fifteen feet by twenty feet. There were no special features except the layer of yellowish sandy clay deliberately laid on the General Belgic Level. It overlapped the offset of the west wall.

Room II

The room measured fifteen feet by seven feet six inches. A similar yellowish sandy clay level was found as in Room I, but here a portion of the actual surface of the floor was found *in situ* in its south-east corner, overlying the offset of the east wall of the room. It consisted of a hard grey clay, about half an inch thick, and resembled a mud floor; this floor lay on a deposit of burnt red clay, four inches thick, the latter being the remains of the earlier Belgic occupation, levelled out over Chalk Floor II. It was noticeable how easily the later Roman debris was removed without damaging the actual surface of the mud floor. The north and west walls of the room were as well built as the others, although they were interior ones.

Room III

The room measured eleven feet by nine feet six inches. The yellowish sandy clay constituting the floor level rested on the offset of the west wall of the room. On this floor level and towards the centre of the room were the remains of a hearth, Hearth VI, a circular patch of burnt earth, measuring two feet ten inches in diameter and having the remains of charred timber and burnt flints on it. In spite of the position of the hearth no actual mud floor surface could be detected, as was possible in Room II. The north wall of the room showed an interesting detail of construction. It was a continuation of

¹ Some were fourteen inches in length.

the north wall of Room II and here showed in a remarkable way its use as a bedding for a sleeper beam (plate vii). The top of the wall was smoothed with a spread of hard rammed gravelly mortar, with a flange on each side of mortar, which had once encased a sleeper beam. The width of this matrix was ten inches, the mortar casing being three inches thick on either side. This was direct evidence that at any rate the partition walls of the house were of timber construction. There was a certain amount of Roman building debris as filling at the west side of the room, and this contained fragments of a great variety of painted wall plasters.

Room IV

The room measured eleven feet by four feet, and on account of its size may have been a passage rather than a living room. The filling was similar to the other rooms described before, the yellowish sandy clay being well marked, although no actual mud floor surface was found. The filling resting against the north wall of the room had been disturbed for a width of six to eight inches from the wall, and contained later building debris, but this was accounted for by the later rebuilding there, when a wider wall was superimposed. A large heap of flints lay against the east wall of the room. These flints rested directly on the remains of the scattered daub due to the levelling process of the last of the Belgic huts by the builders of this first stone house. They were clearly part of a dump of building material left by the mason, to become part of the floor of the passage; or, if the latter was part of the staircase to an upper floor, they might well be a store of flints for repairs, kept beneath the stairs.

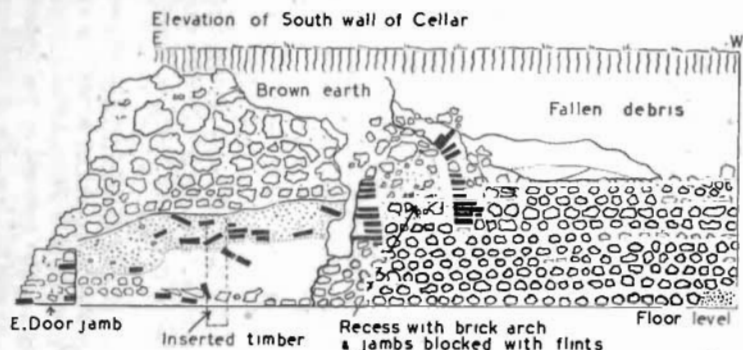
Room V

The room measured nineteen feet by twenty feet and was the largest in the house. That it played an important part in the establishment was seen by the various changes that took place in it. With its three previous Belgic phases the excavation and interpretation proved a difficult operation. The destruction of part of the east wall of the room by the gravel diggers was no help. For its first Roman period, however, nothing can be said, as no floor level remained except for a minute portion close to the west wall. It did, however, seem that the burnt daub from the Clay Floor B hut of the previous period had been strewn about and stamped down, to form a floor of the first stone house, and that too after no long interval.

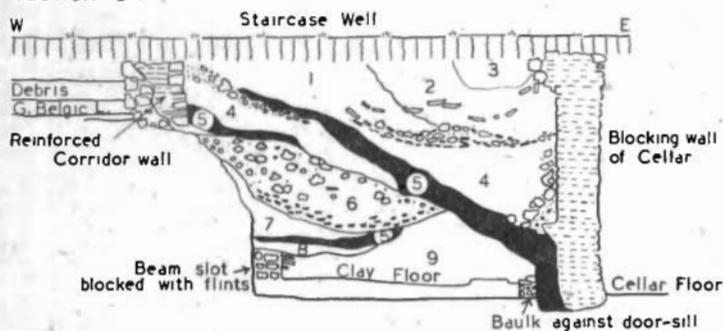
The Cellar

The cellar, twenty-three feet long, eight feet wide and probably seven to eight feet high, was a long narrow room placed at the north end of the house. The gravel subsoil had been removed to a depth of five feet for a distance of forty feet. In the eastern part of the resulting hollow the cellar had been erected; the rest of the hollow extending westward for nine feet was for a stairway. The original doorway into the cellar lay at its western end, but little remained of it except for vestiges of a return of the north wall southwards and a beam slot, described below, which contained the sill of the actual door. At the east end of the cellar only the lowest course of a flint wall remained.

The masonry varied in the two remaining walls on the north and south sides of the cellar, but the same coarse pebbly orange-coloured mortar was used in both and was also similar to that used in the house just described. The masonry of the south wall was of level courses of split flints, averaging four inches in height, eleven courses of which still stood for nearly half the length of the cellar. There were medium sized joints filled with the coarse pebbly orange-coloured mortar, but no bonding courses of bricks. The wall (fig. 5, Section H-H) varying from twelve to seventeen inches in width, was roughly built against the gravel at the back but had a good face showing into the cellar. The north wall was on the whole in a more ruinous state, only six courses of flints standing at the most. In its eastern half, which was higher than the western, there remained a triple bonding course of bricks two feet from floor level, set in the same coarse pebbly orange-coloured mortar. The wall, slightly wider than the south one, was eighteen inches wide and was also roughly built against the gravel side of the hollow.



SECTION G-G



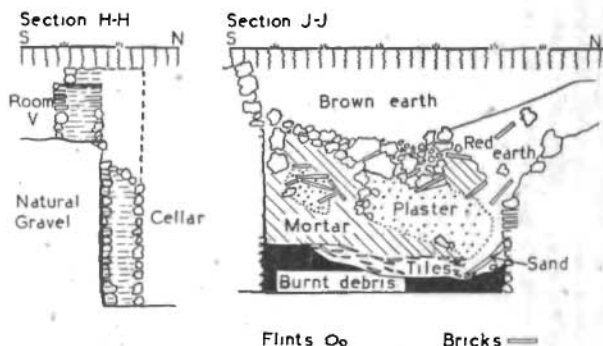
1. Dark brown earth with building debris
2. Light brown earth with fallen plaster
3. Crushed plaster
4. Soft brown filling

5. Burnt debris
6. Flints, bricks & tiles
7. Clay with gravel
8. Mortar debris

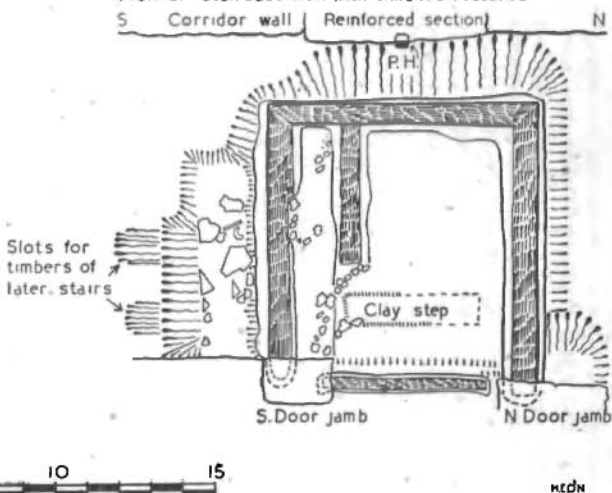
9. Gravel



FIG. 5. PARK STREET VILLA: ELEVATION OF S. WALL OF CELLAR ;



Plan of Staircase Well with timbers restored



SECTIONS G-G TO J-J ; AND PLAN OF STAIRCASE WELL

A recess with round-headed arch and jambs of brick was placed halfway along the south wall, its sill being two feet six inches above floor level (fig. 5; Elevation of S. cellar wall, pl. ixb). It was two feet six inches high from sill to the crown of the arch, two feet four inches wide and eighteen inches deep and had smooth plastered walls, the plaster being about one inch thick. This recess, with at the most only three inches of masonry behind it against the gravel, must have been a serious menace to the stability of the cellar. It was not surprising, therefore, to find that the weight of the roof as well as the pressure of the gravel and the buildings adjoining proved too great and brought about a collapse of the cellar. A large crack in the masonry developed just east of the recess, pushing the latter out of the perpendicular and causing the collapse of the eastern half of the wall as well as of part of Room v, which adjoined it above.

There was no artificial floor of the cellar in this or perhaps any other period, the natural gravel having been used.

The stair to the cellar appears to have been a flight of steps leading straight down to the entrance from the west. This area or staircase well measured nine feet square. That it was an outside stairway seems probable, as nothing was found to suggest the presence of a roof at this period. There was one post-hole, which was found in the top surface of the gravel at the head of the stairs. The hole was partly under the corridor wall of the following period; so it must belong to the period under discussion. It was square cut at the top, measuring five inches each way, and clearly showed the impression of the timber which had a tapering point. It had been driven to a depth of fourteen inches into the gravel. The post may well have been for the support of the upper end of a hand-rail. In the gravel floor of the staircase well there remained the slots for three horizontal timbers laid along the edges of the south, west and north sides (fig. 5; Plan Staircase Well, pl. rva). These slots measured about twelve inches in width and six inches in depth and must have contained the foundation of a substantial framework of the stair. Another slot for a shorter timber lay close to and parallel with the southern slot. There was also the slot of a beam, eight inches wide, for the door sill of the cellar, and west of this lay the remains of a clay floor which stretched across the area of the well. Between the clay floor and the beam slot of the door sill, there remained a narrow clay baulk, nine inches high and six inches wide, made up of broken tiles; it was used presumably to keep the beam in position. The sides of the staircase well were found in good condition with their vertical faces intact, suggesting that vertical timbering must have been fitted into the horizontal beams, to prevent the gravel silting back into the well.

Yard Wall

The footings of a slightly built wall, running for twenty-one feet, lay nine feet outside the south-west corner of the house and two feet seven inches below modern ground level. It may well be the remains of a wall to screen the rubbish pits, which here lay so near the house. The wall consisted of flints and broken tiles, the latter laid flat, the whole embedded in clay. The wall ended at its north end in two flints set up on edge. On the same level as the footings was a spread of gravel suggesting a pathway or at least the ground level of the time. Since this wall ran below one of the partition walls of the corridor of the next period, it must belong to the time of the first stone house.

Rubbish Pits I, III, IV and v

Four rubbish pits belonging to this period were found, containing many sherds and other objects. The date of the sherds clearly showed the successive use of the pits and the gradual accumulation from continuous occupation, some of the wares being of purely Belgic make, others being fully Romanized.

Rubbish Pit iv was the earliest of the five found and had been a shallow trench twelve feet wide, six feet beyond the yard wall just described. It was more in the nature of an open cess-pool than a pit, as a band of compact black silt in it resembled a deposit laid down by water rather than an accumulation of household rubbish. The bottom of the trench was only three feet three inches from modern ground level. It was not possible to excavate the full extent of the trench because of the activities of the gravel diggers, but a length of

ten feet was examined. The black deposit on the bottom of the trench varied from three to nine inches in thickness and yielded many sherds, fragments of window and other glass (fig. 11, no. 22), bronze objects, amongst which were a needle, two nail picks (fig. 8, no. 12), a hasp (fig. 8, no. 9) and a wire handle. There were also fragments of animal bones, and iron objects, amongst which were many nails.

Amongst the sherds the most noticeable were the remains of Belgic hand-made bead rim bowls (fig. 16, nos. 16, 17, 18), a small cordoned bowl (fig. 16, no. 2), a platter of coarse grey ware (fig. 16, no. 9), large storage jars (fig. 16, nos. 14, 15), a globular beaker (fig. 16, no. 19), a small butt beaker (fig. 16, no. 20), and a jug in white ware (fig. 16, no. 22). These sherds, ranging down to c. A.D. 65, belong to the earlier phases of the use of the rubbish pit, the latest dateable sherd being of Samian form 37 of A.D. 70-80 (p. 75; fig. 13, no. 8). Rubbish Pit IV in due course becoming unusable, a continuation of it was opened on its west side, named Rubbish Pit III. Hence came the discovery, stated in Mr. Corder's note (p. 80; on fig. 16) on the pottery from Rubbish Pits III and IV, that sherds from the same pot came from both pits. Rubbish Pit IV was partly levelled up with a layer of gravel and on this a dump of building debris containing broken bricks and tiles was deposited. At the base of the building debris there was a thin layer of fine brick chippings evidently a brick layer's working floor. The brick chippings extended right up to the corridor wall and were also found within Room XI in the area between that room's west wall and the south-west arm of its hypocaust system, and had apparently been cut through when the corridor wall was built in Period VII.

Rubbish Pit III was seen, in a section made by the gravel diggers, to extend for quite twenty feet, but only twelve feet of it could be excavated. The rubbish pit, however, which appeared to have been a long wide open drain, was of the same depth as the adjoining pit and had a similar black deposit, containing sherds and other objects. The northern edges of both these rubbish pits were sealed by a mortar deposit, constituting a floor belonging to a yard, constructed in the next period. This rubbish pit, as in the case of the last one, was filled in with a layer of gravel; above this was placed an earthy filling with a deposit of building debris on top, containing a great deal of coloured plaster. This debris was directly below the yard floor mentioned above. It can be safely assumed therefore that the coloured wall plaster belonged to one of the rooms of the first stone house. Mention is made here of the coloured wall plaster, because, when found, it still retained a very bright pinky-red colour and was in good condition, suggesting deliberate removal from the walls rather than just natural decay. The finds from the pit were mostly sherds, but quite a number of fragments of glass vessels were found in addition to window glass (Cat., nos. 2, 3, 14-17, 21). The most important example of glass was the bowl fragment of fine Alexandrian colourless glass with papyrus-sprays cut in relief (pl. IXA, fig. 11, no. 2). Amongst bronze objects was a scent scoop (fig. 8, no. 4) and there were the usual remnants of broken animal bones, iron objects and iron nails.

Amongst the sherds the earliest were Belgic hand-made bead rim bowls (fig. 17, nos. 1, 2), and the native dish (fig. 17, no. 23), Roman pottery from the first century A.D. to the Hadrian-Antonine period (first century: fig. 17, nos. 10, 11, 16-22, 27, 28; Hadrian-Antonine: fig. 17, nos. 4, 7, 8, 9, 13) are well represented and a Samian sherd, form 37, A.D. 110-120 (fig. 13, no. 7) belongs to this group. Nothing later than the middle of the second century was found in this pit.

Rubbish Pit I¹ lay forty-one feet north-west of the house. Its position may be contrasted with that of the other Pits, but this may well have been due to plans for the enlargement of the house which took place in the following phase of the villa's life. It also helps to place the use of the pit rightly in the chronological order of occupation. It was an oval shaped pit, ten feet long, five to six feet broad and four feet deep from present ground level. It had been partly dug away by the gravel diggers before being recognized. A layer of black debris, twelve to fourteen inches thick, lay at the bottom. Broken bricks and tiles lay on the top of the black debris and the whole was sealed down

¹ Rubbish Pit 1, accidentally but fortunately found by the gravel diggers, is included on the plan to show its size and direction from the

house but its exact position is stated on the plan at the top left-hand corner of the pit (fig. 3).

by a deep deposit of clayey earth. A large quantity of sherds were recovered from the black layer, and amongst other small objects was a bronze brooch (fig. 8, no. 2), fragments of a small round silver mirror, (p. 65), a perforated bronze latch, two small flat bronze rings, resembling modern washers, and some glass vessels (Cat., nos. 1, 17). The dating of the sherds (fig. 16, nos. 1, 3-8, 10, 11, 21, and fig. 13, nos. 5, 6, 9) appears to be similar to that from Rubbish Pit III, that is, nothing later than the middle of the second century A.D., but there is an absence of bead rim pots, which may well suggest that this pit came into use during a later phase of Period VI than the other pits. The latest Samian from the pit is dateable to A.D. 130-140 (fig. 13, no. 9).

Rubbish Pit v was a small rectangular pit with rounded corners, dug into the natural clay in Room v. It was placed near the south-west corner of the room, and was five feet nine inches long, four feet wide and two feet six inches deep from Roman floor level, but four feet from present ground level. Its form was remarkably well preserved, with vertical sides still intact, suggesting that it had not been long in use. It had been dug through the General Belgic Level, had cut Gullies II and III and its north side had cut the south side of Belgic Pit I. It was filled with a very stiff yellowish clay, containing flecks of charcoal and daub. One side of a box flue tile was found near the bottom and resting on the very base of the pit was a large sherd of Samian, form 37, A.D. 115-120, but riveted (fig. 14) and sherds of a bowl in hard, thin, pinkish-buff ware which falls into a period c. A.D. 110-130. There was little indication of the use to which the pit was put, as so little rubbish was recovered from it, but that it was for some sort of drainage seemed probable, as at two levels in the filling (at six and two inches above bottom) there were thin layers of black deposit, suggesting residue left by stagnant water. The pit, after being filled up, was sealed by the building of the south-west arm of the hypocaust system right across it, which took place in the reconstruction of Period VII.

The Well

The supply of water being a necessity, it is almost certain that the well existed from at least the earliest period of Roman construction. Therefore, as it was the only well found, it will be described in this Period, with the assumption that it remained in use until the end of the occupation of the site.

"Before the main building was reported the mechanical grab had destroyed all but the lowest two or three feet of a well that had been situated in front of the house. The well had been sunk through the compact gravel to a depth of sixteen feet from the present surface until a thick bed of red clay was reached that here underlay the gravel. Its presence was indicated first by a disturbed pile of broken tiles and bricks. When these were removed, a shaft, two feet seven inches square internally, was revealed. No evidence was found of any steyning or timbering designed to hold up the sides of the shaft, and certainly none had existed in the lowest few feet of the well that could be examined. At the bottom of this shaft, where water had run in along the stratum of clay, four beams of oak, originally five to seven inches square in section and two feet seven inches long, had been employed to support the sides. They had been roughly pointed at the ends to allow overlap, rather than accurately dovetailed, and on the south side the additional support of a flat board placed on edge outside the timber frame had been used (pl. 19c).

The filling of the bottom part of the well was of considerable interest. The bottom eight or nine inches was found to be deliberately packed with a mass of charcoal, which had blackened the water-logged timbers described above and stained the surrounding clay a grey-blue colour. Above this charcoal bed, as far as it was possible to examine what was left of the shaft, the well had been tightly packed with a mass of broken tiles and bricks, including numerous tegulae and imbrices as well as fragments of the usual building tiles (originally one foot six inches by one foot and one and a half inches thick), square hypocaust bricks, and a few thinner tiles. Much of this material had clearly never been used for building, and may be supposed to represent waste material from the Nether-wyde tiliary, or from others that await discovery in this neighbourhood.

The explanation of this filling would seem to be that the charcoal was designed to provide a filter for the water that ran into the well along the surface of the clay-bed. The

erosive action of this water would tend to cause the collapse of the gravel sides of the shaft at least near the bottom, and this was guarded against by packing the lower part of the shaft with broken tiles. This would serve both to keep up the gravel sides of the shaft and to hold the charcoal bed in place. It could not, of course, have been used except below the natural water level in the well.

No datable object was found at the bottom of the well, and indeed anything that had fallen into it during use would have rested upon the bed of tiles and have consequently been removed by the quarry grab."¹

Direct evidence of the date of erection of this first stone house is meagre, consisting in fact of one sherd of Samian form 37 of c. A.D. 70-80, which was found in the yellow clay floor of Room IV. It is later than the Clay Floor B of Period V, since the west wall of Room V overlies part of that floor, where it covers the filled-in Belgic Pit II (see section B-B, fig. 4). That the Clay Floor B hut was burnt to the ground was shown by the finding of an enormous amount of burnt daub and other evidence of burning. Since the pottery associated with this floor and its apparently contemporary Chalk Floor I includes wares which are unlikely to have reached Britain until after the conquest of A.D. 43, but also unlikely to have been in use for very long after it, it seems logical to give the clay floor a short life after c. A.D. 45. It follows that its sudden end by burning may be tentatively ascribed to the time of Boudicca's revolt.

As already mentioned, the daub of this destruction seemed to have been levelled and used as a floor or basis for a floor, when the stone house was built. The complete absence of any deposit over this daub, which might indicate a time when the site was deserted, suggests, although it does not prove, that the new house soon replaced the burnt-out hut. A similar absence of a sterile layer above the remains of Chalk Floor I supports this suggestion.

Similar support is forthcoming from the Rubbish Pits IV, III and I. Their evidence is only presumptive, since they were not related stratigraphically to any part of the first stone house. Their contents do, however, indicate unbroken occupation of the site throughout the second half of the first century A.D. The preponderance of early sherds, i.e. c. A.D. 43-75, mostly Belgic wares, is most marked and cannot be entirely explained by a conservatism, which may have made or at least used vessels, when they were fifty years old in type.

The natural conclusion is that the first stone house followed soon after the suppression of Boudicca's revolt. It is, therefore, looked upon as a Flavian product, but may well date from as early as c. A.D. 65. The one first century coin found on the site (Vespasian, no. 1) was indeed found in Room V, precisely in a position which it could have occupied in a house built at that time, i.e. just above the layer of burnt daub; but it did not lie in a sealed deposit.

PERIOD VII: ROMAN

Enlargement of house. Addition of corridor. South and North Blocks of Rooms

With settled prosperity in the countryside and the passing of at least two generations of occupiers since the erection of the stone house, it is not surprising to find that alterations, repairs and enlargements were necessary, to keep pace with current ideas. A corridor was added along the whole length of the west side of the house and extending as far as a block of new rooms on the south and to another block to the north. A hypocaust system was inserted into Room V, and a yard floor laid down on a small area outside the middle stretch of the corridor. Flint was still used in this masonry, which was of a rougher type and the mortar was a buff-coloured sandy mixture.

The Corridor

The corridor (pl. 1a) was a hundred and twelve feet long and eleven feet wide; its western wall, two feet wide, of four courses of flint, was still standing two feet high. The two lower courses bedded in clay, were built in a trench cut with vertical sides; the two

¹ I am indebted to Mr. Corder, who excavated its remains, for this description of the well, since it was destroyed before I began work on the site.

upper courses were set in buff-coloured sandy mortar. At the southern end of the corridor only mortar debris of the eastern wall remained, but this clearly showed that the wall had extended here, the actual straight joint with the south-west corner of the original house being still *in situ*. North of this junction at certain points, a wall in the new mortar was now superimposed on the western wall of the first house, which must have been ruined or demolished. It was noticed that the top of the original wall had been levelled off and had received a layer of broken tiles, to take the new wall.

There were four partition walls at varying distances along the corridor, all fifteen inches wide and built two to three courses high of rough flints, bedded in clay. The east ends of the two southernmost partition walls had been ruined, but at similar points of the other two it was seen that they were abutted against their respective main walls with a liberal use of clay. They also abutted against the western corridor wall, but must have been erected at the same time, as droppings of the buff-coloured sandy mortar left over during the erection of the main wall were found mixed in the clay of the bedding of the partition walls. In two cases this mortar overlapped the flints that actually touched the corridor wall. No mortar was used as part of the binding of the partition walls themselves, except in the northernmost one, where a liberal amount was found used in the abutment at its west end instead of the clay as in the other walls. The partition walls, the highest of which only stood twelve inches high, appear to have been the foundation for sleeper beams to carry upright timbers and not for use as foundations for flooring. No post-holes were found near or in the walls, and a thin spread of gravel, found covering most of the central length of the corridor above the General Belgic Level, seems to have been the floor. The corridor led to a block of three large rooms built at the south end of the site, Rooms XII, XIII, and XV. Room XV had been partly removed by the gravel diggers, so that the full extent of this southern wing could not be followed. In any case the builders of the following period so dismantled these rooms, that only the footings of the walls remained and were recognized solely by the buff-coloured sandy mortar, similar to that used in the corridor walls. It did seem, however, that there had been a long oblong room projecting slightly west of the line of the corridor. The north wall of Room XIII had been almost eradicated by stone robbers, but sufficient remained of its mortar to be certain of its plan. The small oblong block of masonry projecting from the north wall of this room into the corridor was a low pillar, which seems once to have been attached to the wall behind and may have been connected with a similar projection into the corridor from the west wall of Room XII, to form perhaps the support of a stairway.

At the north end of the corridor the evidence was confused by the destruction of the gravel diggers. The north-west return of the corridor wall itself was clear, but there was not the same layout of rooms nor was it on such a large scale as that found at the south end of the house; this part may, therefore, be assumed to have been the servants' quarters. No important objects were found in this area, and no floor levels could be discerned.

Hypocaust in Room v

The introduction of a hypocaust system into Room v was an interesting feature of this period (pl. IIB). This consisted of a central flue running three quarters of the way across the room from west to east. Two smaller side flues, running at a higher level, branched off on either side half way along the main flue and returned to the corners of the room. The mouth of the furnace opened onto the corridor and was built into the original west wall of the room, which had here been removed to allow of the alteration. A small area, six feet long and four feet wide, was hollowed out of the corridor floor to allow of access to the furnace, this stokehole reaching the partition wall which stood nearby in the corridor. The furnace was built of brick, and, as in the case of the brickwork of the other furnaces, to be described later, many of the bricks had been robbed. Here only the bare footings were left at the actual mouth. Further along the flue, however, the brick walls were standing as much as seven courses high. They were built on two courses of small flints, except for that part of the south wall, which lay over Belgic Pit 1, where a third course of flints had to be used, to make up for the subsidence caused by the pit. The brick walls stretched for nine feet and then ended, to make way for the side flues,

while the main flue continued as a shallow channel, eight inches deep. In this part its walls were of two courses of flint except that the upper course on the south side was replaced by one of broken tegulae, set at an angle. The mortar used in the flue had a larger percentage of clay than in normal walls, but at the furnace end the buff-coloured sandy mortar was used. It showed clearly in the masonry where it overlapped the original west wall of the room with its coarse pebbly orange-coloured mortar. The plaster facing of the flue walls remained and had been burnt a bright pink colour. The main flue, sixteen feet long and eighteen inches wide, ended at the east in a wall of one course of large flints with tiles laid flat on top. There were no covering tiles over the flue. The north and south branching flues, from six to nine inches in width and six inches high, were enclosed by walls of small flints bedded in mortar of this period. Part of the north wall of the north branching flue was, however, built of bricks set at an angle. The floors and walls were all plastered and in part of the floor of the southern flue water-worn pebbles had been used. The two branching flues curved back to the south-west and north-west corners of the room respectively, where they abutted against the original walls with a liberal use of mortar. At the point of junction of the branching flues with the main one a shelf (no. 1) (see plan, fig. 3) with mortar surface, sixteen inches wide, was found on either side for the remaining length of the main flue eastwards. Unfortunately a great deal of the north-east end of the hypocaust here was ruined during the collapse of the cellar, and, although mortar footings of some sort were found, their plan was not certain, it has to be presumed that the finds on the south side were repeated on the north side. Another shelf (no. 2) standing three inches higher and ten inches wide, made of bricks laid on one another was placed on shelf no. 1. Beside this again a roughly built wall (shelf no. 3), sixteen inches wide and six inches high was found. The latter was built of bricks set at a pitched angle with a layer of flat broken tiles on top. At the mouth of the southern branching flue and built into shelf no. 2 was a slot for some form of damper for regulating the draught. This arrangement of differing levels and the curious design of the whole hypocaust system was at first difficult to elucidate, but it seems fairly clear that the construction belonged to a corn-drying floor. For this purpose the heat had to be regulated to such an extent, that a double floor was needed to prevent the overheating of the corn. From the scanty evidence that could be derived from the remains discussed above it appeared possible to work the system as follows. The hot air passed up the main flue from the furnace, and on reaching the end of the flue passed through an aperture there on to a floor level supported by shelves no. 2. The hot air then continued in the space between the latter floor and an upper one supported on shelves no. 3, and was eventually conducted by the side flues into chimneys or some form of outlet. The corn to be dried was laid on the top floor and thus never came into direct contact with the fiercest heat. The use of the branching flues must have been for creating and regulating the draught as well as for carrying away smoke and fumes. If this is the right interpretation of the hypocaust system, the remainder of the floor space in Room v, which was not heated, would have been used by those who were carrying out the work of corn-drying. It is also probable that the heated floor level was raised above the floor of the room, in which case it would have served as a platform to which there was access from three sides of the room. A reconstruction (see fig. 24) very kindly drawn by Mr. J. Seymour Lindsay, F.S.A., shows the apparent form of this floor.

A slight alteration took place in the north-western corner of the cellar in this period, the western face of the door jamb being refaced in masonry with buff-coloured sandy mortar. It is probable that the extra cut back into the natural gravel on the north side of the staircase well was made at the same time, and that the whole work was merely done to ensure the stability of the structure.

Lime Slurry 1

At some time during this period the use of the southern end of the corridor was changed, a part of it now being converted into a workshop for manufacturing tesserae (pl. IIIa). The second partition wall from the southern end was removed except for its flint foundation, to make way for a lime slurry and similar builders' materials. The latter consisted of a store of broken bricks, two of which were yellow ones, tegulae and box

flue tiles, collected in a heap around the southern half of the slurry, forming the raw material for the tesserae, while an area of about four feet by six feet north of the slurry was covered with a thick layer, five inches deep, of minute chippings of brick, the debris left by the cutting up of the bricks into tesserae. The brick chippings covered the partition wall, which had been dismantled, as described above. The slaking of lime, as described by Dr. Davey in his report (p. 103), was an important operation, and was done by sinking a shallow pit in the ground, into which the lime was poured and then slaked with water. The stirring needed to mix the contents would create the size and shape of the pit. The slurry was found as a solid mass of lime, roughly circular, with a diameter of two feet nine inches and twelve inches deep. An irregular rim two to three inches high stood around the slurry and on the slightly rough surface of the slurry itself were embedded pebbles and other impressions of foreign matter, showing that the urchins of that day were up to mischief, whenever an opportunity occurred. A thin layer of clean 'pea' gravel (so called on account of its minute size), the excavator's sign of an approaching hard surface, lay on the slurry. For two or three inches above the slurry the filling was of dark earth covered by red and grey ash, and in this layer brick tesserae (of a large coarse size), sherds, iron nails, and oyster shells were found. The sherds were those of late second or early third century A.D. date, while sherds found mixed up in the store of bricks were of the third century or earlier as well as some of Antonine or later date, while sherds below the bricks were of the second century. Sherds were also found in the heap of brick chippings as well as below; those in the chippings were undatable, while those below were of the early second century.

This evidence suggests that, although the slurry was not a primary feature of this period, since it overlaps a demolished partition wall of the corridor, it was nevertheless in use during the second century as well as perhaps in the early third century. This points to alterations or additions to floors, etc., during Period VII, of which there are no other traces.

An object of great interest was found below the brick chippings and resting on the partition wall; this was an iron flue scoop or soot rake (fig. 10, no. 13). Mixed with the top layer of chippings were a number of finished tesserae; these, as well as chippings, were embedded in the outer edge of the slurry, and clearly indicated the use of the workshop and of the lime for use as the bedding of tesserae in the floors. There was a wide area of burnt ground around the east side of the slurry, and the find of ashes over the slurry itself seems to show that the workshop was eventually burnt down.

Lime Slurry II

The remains of another slurry was found outside the house by Room XIII. It was somewhat oval in shape, and was two feet nine inches across and only six inches thick. It was not in such good condition as the slurry just described. There was a similar heap of brick chippings beside it, but no finds were made to suggest a date when it was in use.

Yard Floor

West of the corridor a considerable area of ground was covered by a thick layer of the buff-coloured sandy mortar, which was characteristic of this period. This yard floor, as it may be termed, sealed part of Rubbish Pits III and IV, the contents of which have been described under Period VI. A small area of four by five feet was left uncovered by the mortar in the yard floor; it appears to have been either a rubbish pit or a drain (Rubbish Pit II). It was filled with dark earth containing sherds, oyster shells and other household debris. From its western side ran a small drain twelve inches wide, filled with large flints like a soak-away. The mortar floor sloped towards the pit, clearly showing its drainage purpose. On the mortar floor there was a layer of the clean 'pea' gravel, as described above (p. 48).

From a material point of view the house in this period must have reached a high standard of luxury. In addition to the introduction of tessellated floors instead of the mud ones of the last period, fragments of Purbeck or Sussex marble were found, whether for use in floors or for wall decoration was not discovered. There was also the great

variety of painted plasters (p. 53), fragments of which were found used as mortar in the north wall of Room VII. The find of three examples of tiles, one of which was complete, with a semi-circular extension at one side, for building engaged columns, showed that a finished appearance to the building was appreciated. That these columns were probably in the rooms at the southern extension of the house in this period may account for the excessive robbing that took place here, and may also be the reason that so few were found where hundreds must have been used.¹ Two of the three tiles found were in the debris deposited in that part of the house by the builders of the following period. The measurements of the complete tile were eleven and a quarter inches square, one and five-eighths inches thick, the extension of the half round on one side three and a half inches long. The greatest length being fourteen and three quarter inches (fig. 23, no. 1).

The latest pottery from Rubbish Pits III and IV, sealed by the Yard floor, may be taken to indicate a date in the middle of the second century for the making of the yard and in consequence of this for the erection of the corridor, etc., in this period. Confirmation of this dating comes from Room V, where the southern branching flue of the hypocaust sealed the filling of Rubbish Pit V, which contained a decorated Samian bowl of c. A.D. 115-120 (fig. 14).

PERIOD VIII: ROMAN

Reconstruction of House. Alteration of Staircase to Cellar

From the evidence of the rebuilding which took place at this period it appears that the house had fallen into serious decay and may actually have been deserted. The house was now entirely rebuilt. Except in the cellar none of the old walls were retained above a few courses in height, but many of them now served as bases of new walls in a different style. Owing to their proximity to the modern surface a trace of new mortar was often the only evidence that they had been so used.

The type of masonry now employed was less neat than in earlier periods, flints with broken bricks and a few stones, such as, fragments of querns of millstone grit were used for walls wider than hitherto, set in a liberal amount of white mortar. As a rule only the foundations of this walling remained but there were two exceptions, the west wall of Room XIV and the north wall of Room XV. These were well and solidly built and had deeper foundations, the latter at any rate being built anew from the ground up. The enormous amount of the white mortar used was most marked in the north wall of Room XV, as well as in the rebuilt south wall of the cellar.

It is probable that there had been a serious collapse of the south-east end of the cellar, brought about by the inadequate width of its south wall to withstand the pressure of the ground behind it and the structure at a higher level. The condition of the recess when excavated (fig. 5 and p. 42) showed that it also had been a serious point of weakness. Complete rebuilding of the eastern half of the south wall was needed. In the lower two to three feet of the wall a certain amount of the fallen material was reused with the addition of bricks and a few specimens of Hertfordshire pudding stones. The new courses, however, were not matched in line with already existing ones. A single upright timber, three feet high, had been encased in the wall, as a space was found with the impressions of the wood in its mortar matrix (fig. 5, Elevation of S. cellar wall). Presumably the wooden upright helped to give stability during the erection, as it was driven well into the ground below the first course of flints. The face of this lower part of the wall was plastered and pieces of broken tile and brick were applied to it without any apparent reason or design. Three courses of brick were placed on each side of the top of the upright. The upper part of the wall was built of very large flints² (pl. VIIA) and was wider than normal, resting partly on a shelving platform of the gravel at the back as well as on the wall already described. The difference in the materials, technique of building and the colour of the mortars was very apparent, especially at the junction of the white and coarse pebbly orange mortars. The recess had to be blocked, to add to the stability of the whole wall, and this was done with the large flint type of building.

¹ Tiles of similar shape, but larger ($24\frac{1}{2}$ " + $12\frac{1}{2}$ " + 2") have been found in Lincoln.

² The size of some of the largest flints were 14 in. by 11 in. by 8 in., 14 in. by 14 in. by 6 in.

Two large post-holes were found in the floor of the cellar in front of the rebuilt wall ; these were probably made for scaffold poles during the rebuilding. They were still in position when the plaster face was added to the lower part of the wall, as the plaster was found spread on to the floor as well, for a distance of one foot and was packed around the post-holes. On removal of the poles the holes had been filled up, one with debris and the other with sand, the latter also containing sherds (fig. 20, no. 14).

At the time of rebuilding a trench was dug along the northern side of Room v, presumably to allow access to the new wall of the cellar (fig. 4, Section E-E). Some time after the work was finished the trench was filled up with building debris, in the lowest levels of which large sherds of two mortaria were found. Enough remained of one of them to form a complete specimen. The other finds from this filling are dealt with under Period IX (p. 56).

A further development at the east end of the cellar was carried out at this period, but unfortunately the gravel digging here destroyed most of the evidence. It was highly probable that the new entrance made at the east end of the cellar led into a small yard, from which an earthen ramp ran up to the ground level. The evidence for this suggestion comes from the profile in the gravel face on the far side of the gravel quarry, where a wide shallow depression filled with 'moved earth' was seen, which could not be otherwise explained. Investigation here became impossible on account of further tips of surface earth from the grab. If this were the case, it would have meant that carts carrying corn or other stores could now reach the cellar.

The new doorway was built, five feet six inches wide, with door jambs of flint and irregular brickwork in white mortar. The southern one was a projection from the rebuilt south wall of the cellar and the northern one was a new piece of work, abutted against the existing north wall of the cellar with a straight joint. The north wall of the cellar was broken near the north-eastern corner and bricks inserted as quoins returning northwards. They still stood six courses high, one of the bricks being a yellow one. The new wall face at the return continued northwards for five feet until it reached another wall at right angles proceeding to the east, the foundations of the latter being set at a higher level in the gravel. A similar wall, starting at the same level in the gravel, was placed against the south-eastern corner of the cellar, these two walls enclosing an area sixteen feet wide, north and south.

A door sill, two feet wide, made of hard white mortar, two inches thick, lay between the door jambs of the cellar entrance. Outside the south side of the entrance, the remains of some brick construction on a small shelving platform of mortar was found. Lying on the bricks was a horizontal charred beam with a pointed end, pushed into a lump of clay and placed up against the cellar door jamb. The beam was five inches wide and nineteen inches long, its form being well preserved. It may have been used as the wooden edge to the door sill and kept in position against the mortar sill, as described above, by two wooden pegs driven into the ground. Two holes for such pegs were found two feet apart about the centre of the entrance and were three and three and a half inches in diameter respectively and both five inches deep. They were found full of dark earth and charcoal from which three coins were recovered : from the southern hole came two of Constantius II or Constans (nos. 51 and 59), and from the northern one of Constantius II (no. 21), found near the bottom of the hole.

On the gravel floor of the yard and pressed close to the base of the northern jamb of the cellar was a layer of clay, part of which had been made into a hearth. The hearth had been made by smoothing the clay into a small platform about seventeen inches long and ten inches wide surrounded on two sides with a raised border. Two hollows were sunk on the platform containing grey ash and charcoal and on these two cooking pots (fig. 23, no. 5) could have been placed.

In this period also the cellar staircase was reconstructed. Instead of a direct flight of steps leading from the west the stairs now led down from the corridor on the south. The gravel face of the staircase well on this side was cut back an additional two feet six inches for a length of seven feet, to make way for a roughly built wall, of which only the footings remained. Eighteen inches above, the gravel face sloped slightly back, and in

the slope two large slots were found, twelve inches wide in the eastern one and sixteen inches wide in the western one, placed one foot ten inches apart. (Pl. ivb.) These slots probably accommodated sloping timbers for carrying the stairs, which also had the additional support of the low wall already mentioned. Since the direction of the stairs was changed, it was now possible to have a window to light the entrance into the cellar. It was built in the corridor wall opposite the cellar door. It had brick jambs, which still stood four courses high at its inner end, and was splayed externally. Its sill, which sloped inwards, was of mortar, and it was found covered with a blocking of flints. The window had been built into a length of corridor wall, eight feet six inches long, which had been refaced on its eastern side in the style typical of this period, flints with irregular brick courses set in the white mortar (pl. iiib). The western entrance into the cellar was affected by this change of the staircase and by the cutting back of the gravel face on the south side of the staircase well. A new southern door jamb was erected of flints with brick courses set in white mortar, but its eastern face, as far as preserved, was entirely of bricks. The bottom course on the west face was composed of one large specimen of Hertfordshire pudding stone. This new door jamb was placed over the end of the south beam slot of the staircase and stood as an entity, not bonded into the earlier work to the south. A new wall had now to be built beside the new stairway and up against the sloping gravel face. This involved underpinning the north-west return of Room v, which stood at a higher level. It was interesting to see the means employed and the actual juxtaposition of the coarse pebbly orange coloured mortar of Period VI with the newly-added white mortar, where the latter at several points was below the earlier period work. Only the slightest evidence of the northern door jamb remained, as the blocking of the doorway in the following period destroyed a great deal of it. It had used the flint wall of Period VII for the lowest three feet and some two feet above this there remained some masonry of flint and brick courses similar in style to the other door jamb, the intervening masonry having been destroyed. The width of the doorway between these jambs was five feet six inches. At a height of seven feet above the floor of the staircase well both door jambs merged with masonry of this period, flints with good bonding courses of bricks. This masonry stood to a height of one foot and was present along the whole line of the western end of the cellar; it was in fact part of a main north-south wall in this period and formed the base of the western wall of the room over the cellar. Its lower line of junction with the blocking wall of the next period seemed to indicate that there had been a semi-circular arched opening into the cellar at this time.

Room xi measured fifteen feet by fourteen feet and was heated by a hypocaust system on a double T plan (pl. va). It was erected across the corridor and was placed at about the middle of the western wall of the original house. Its position was curious, as was the use of the western corridor wall for the first pair of branching flues. The width of each wall of the room varied, from two feet six inches to three feet, all being wider than usual and fairly well built of flints set in white mortar. The north and south walls stood two feet three inches high, of six courses of flint of which the two lower were set in clay. The east wall was superimposed on the west wall of the first stone house, but overlapped it on account of its greater width. The difference in structure and colour of the mortars was very noticeable. The hypocaust flues remained in good condition, though some robbing of bricks had taken place at the mouth of the furnace, where the round headed brick arch was found broken and fallen into the stoking pit. The face of this archway had been plastered, half an inch thick and was colour-washed, as several coats of white and terracotta wash were still to be seen. Bricks were also used at the corners leading into the branching flues as well as for the first five feet of the main flue (pl. vb); at one point in the latter they were still standing eight courses high. The rest of the walls were built of flint except for one short stretch in the south-west branching flue, where bricks were used set at an angle. The width of the flue walls varied and the flues themselves were narrow and from sixteen inches to two feet deep. Their walls and floors were plastered and the latter rose slightly to their respective ends. No floor was found of the room, but tiles and bricks laid flat on the top of the flue walls suggested that it lay immediately above them. A smoke outlet was placed at the end of the north-east branching flue (pl. via),

which was constructed on a T plan. The smoke, however, issuing at ground level and into the corridor, suggests that the corridor here cannot have been a room for normal use.

To accommodate the smoke vent, an additional wall, two feet wide and built of enormous flints, was placed along the outside of the north wall of Room XI (fig. 4, section F-F). It had no foundations, but was placed on the layer of gravel, which here extended up to the northernmost partition wall, and was the floor level of the corridor in Period VII. Stretching for a distance of eight feet or more from the smoke vent was a spread of soot and charcoal. Another small hole was placed at the end of the south-west branching flue, leading from the bottom of the flue up to the ground level outside the corridor wall. It was merely a space left at the junction of the flue wall with the original corridor wall, and must have been constructed for creating a draught rather than for a smoke outlet, no soot or charcoal being found in or outside the hole. The first pair of branching flues appeared at first to have been built in the western corridor wall, but, although the line of that wall was kept, it had been dismantled and a new wall erected to take the flues. The broken ends of the corridor wall were found with the new work of this period abutting against them. The flues, except at the actual mouth of the furnace, were filled with the soft dry debris of fallen plaster and mortar, containing some tesserae of the large coarse brick type and fragments of box tiles, some of which had patterns in relief (fig. 23, no. 4). No sherds were found, and a fragment of a glass flask was the only object of interest (fig. 11, no. 19). The stokehole was three feet deep and roughly pear-shaped, its sides being cleanly cut in the natural clay. A filling of soot, nine inches thick, lay on the bottom, with building debris thrown in along with the dismantled brick arch of the furnace mouth. The lower part of the clay sides of the pit were studded with small flints, and the floor for two feet immediately outside the furnace was paved with broken tegulae. Three coins of Constantius II or Constans were found in the soot as well as sherds (fig. 21, no. 1-4, 6-14, and no. 5 from clay side of pit). There were also several bronze needles, iron nails, and amongst the building debris a certain amount of red-painted plaster. West of the stokehole a roughly semi-circular area, about four feet in radius, of white mortar had been laid partly on top of the already existing yard of Period VII. It had suffered some disturbance and its limits were uncertain, but it appears to have been a floor level, probably for a lean-to shed covering the stokehole.

With the erection of Room XI, which must have been a room of importance, a change in plan of the five rooms of the original house became necessary. This alteration was shown by the presence of white mortar on some walls, but not on others of an equal state of preservation. Instead of five rooms, three were now used, of which the central one of the three was the largest. The new central room was twenty feet square and covered Rooms II, III, IV and part of Room I. These rooms were now apparently levelled up with earth and debris to a higher floor level, but no surface of the floor was found. The north wall of the room was superimposed on the north walls of Rooms II and IV and lined up with the additional north wall of Room XI. The south wall, however, was a new one, and was built to correspond, but roughly only, with the line of the south wall of Room XI. For the building of this wall a trench was dug through the levelled debris of earlier periods. The wall was crudely built of small flints set in a mortar, almost entirely made up of sand, on top of which one course of larger flints was laid set in a hard bed of white mortar. The west wall was shared with Room XI and a trace of white mortar continued southward to the south-west return of the original stone house. In Room I, which had now become smaller, a change of plan appears to have been contemplated but not carried out. This was the cutting of a trench, two feet wide and two feet deep, across the south side of the room, evidently for the purpose of erecting a wall; but for some reason unknown the wall was not required and the trench was filled up. That this was done almost immediately was shown by the fact that the sides of the trench as found by the excavators were in perfect condition which they could not have retained, had the trench been left open for any length of time. For most of its length the trench was filled up with layers of coarse gravel, the different tips of deposit being visible in section. At its east end, however, a certain amount of building material had been thrown in, amongst which was a layer, seven inches deep, of white mortar. The trench abutted against the existing walls of the house at

both ends and was not continued outside. The trench showed in section a good example of the method employed in digging foundation trenches. It was U-shaped with clean cut vertical sides, just the width for the wall and no more.

Of the northern block of rooms of the house very little can be said. They not only received damage from gravel digging, but were so near the surface of the ground as to have been disturbed by ploughing. That the latter was the case was seen by the find of a George III halfpenny on the level of the eastern return of the corridor at its north end.

The white mortar was found superimposed all along the top of the northern half of the western corridor wall and its return eastward. It was also in the two upper flint courses of the south wall of Room ix. The eastern wall of the corridor here was a continuation of the wall of this period which crossed over the western doorway of the cellar and was built of flints with brick courses. The junction of this wall with the south wall of Room ix and with the south wall of Room vii was at first difficult to disentangle until the significance of the different mortars was understood (fig. 3). The north wall of Room vii, which was the last addition to this puzzle, was of a very slight nature and must have been merely a partition wall, as it contained in its make-up mortar *débris* composed of painted plaster.

The rebuilding of the south block was carried out on a new plan, thus necessitating the removal of most of the walls of the earlier rooms to their lowest footings. Room xii and the western half of Room xiii were the most affected. In Room xii the floor and whatever had been beneath it were also removed down to the natural gravel level. As, however, the original use of Room xii was not discovered, and as it had a lower floor level than was the case elsewhere in Period VII, it may have been the site of a hypocaust. Since there was such a large area to fill up to the required new ground level, tons of building *débris* were brought and deposited here. This accumulation presented an interesting study in section, as the different tip layers along this line showed up by the colours of the various mortars, from bright pink through cream to white, with, in addition a large quantity of an almost mud-like mortar containing chopped straw. In spite of the solid nature of the *débris* a certain amount of sagging took place, whereupon a load of coarse gravel was placed across the depression, to level up the area which now seems to have become a yard or other open space.

Rooms xiii and xiv were formed out of a long room of the previous period. The west wall of Room xiii was built in line with the western corridor wall, and along with the south wall of the room showed a type of masonry of a particularly crude nature. The only point of interest in the room were the remains of the base of a brick pillar, fifteen inches long and twelve inches broad, standing eight courses high and set in the white mortar (pl. 1a, in foreground). Its northern edge was partly ruined and may have been slightly longer. Its foundation was set partly into, as well as partly placed on, the footings of the earlier wall, and the difference in the two mortars was very clearly seen. The use of the pillar, whether part of a door jamb or a support for a floor was not discovered. The whole of the earlier remains in this area were covered by a filling of dark earth containing building debris and many sherds, but this was not sealed by a floor level. It was, therefore, not surprising to find in the debris sherds dating from early in the second century mixed with those as late as the first half of the fourth century, though the sherds found on the surface of the debris were all of fourth century date.

Rooms xiv and xv were of interest, as both were built with hypocaust systems, though laid out on different plans. The furnace mouths were so arranged as to be adjacent and thus save labour and time in stoking. Nothing was found to show whether these two rooms were part of a bath system or were some of the chief living rooms of the new house, but the latter appears more probable.

The interior measurements of Room xiv were sixteen feet long by twelve feet wide. The main flue of the hypocaust ran diagonally across the room, from its mouth at the south-east corner to the north-west corner; here branched two side flues, which ran along each side of the room. The main flue, twelve inches wide at first, had walls of brick, five courses high, which stretched for a length of three feet. The rest of the walls were of two courses of flint, standing six inches high. The floor and sides were of mortar

containing crushed brick and were coloured pink from contact with heat ; the floor rose slightly throughout the whole length of the flues. The branching flues were slightly narrower than the main one and were mortared similarly on their floors and walls. The ends of both near the furnace mouth had been deliberately blocked. The hot air presumably was conducted into box flue tiles and had some other outlet for the smoke and fumes, but no indication of these remained. The branching flue on the western side was of especial interest, as enough remained to show part of the method used for supporting the cover of the flue as well as a means of conserving the heat with the aid of tegulae and imbrices (pl. vic). Along the mortar face of the west wall of the room six slight projections or pillars of mortar had been added, and, while the mortar was still damp, imbrices had been placed over them thus moulding the pillars to their form. Two imbrices were found *in situ* and the other four remaining pillars showed the impression of an imbrex. On the mortar face of the wall between the imbrex pillars could be seen the impressions of other tiles. These were of tegulae which had been used to line the wall. The measurements between three of the pillars corresponded with the usual thirteen inches length of tegulae. The larger space between the first and second pillars from the northern end was found precisely large enough to take two tegulae side by side. The tops of the pillars, which projected about four inches from the main wall face, were about one inch below the level of the wall top and must have served the purpose of brackets to support the cover of the flue. Whether the tegulae lining the flue were only for support or even for shuttering during the construction of the flue, it is worth while drawing attention to the possibility of their use as a means of retaining the heat. Unfortunately it was not possible to see if this method was employed at the other side of the room, as the flue here was in a very ruined condition. The triangular areas left between the flues were filled up with debris and a layer of gravel to form the basis of a floor, which was not preserved.

Room xv was sixteen feet six inches long and twelve feet wide, and was almost identical in size with Room xiv. It was also heated by a hypocaust system. It was not built in line with the latter room, though part of it was adjoining, and it was at this point of their overlap that the two furnace mouths of their respective hypocausts were placed side by side. The eastern wall of the room was missing, but enough remained to show the length of the central flue. Use had been made of the earlier walls, as in the north wall of the main flue and the east wall of the northern branching flue. The north wall, wider than the others, was two feet three inches wide and was substantially built, with flints embedded in great quantities of white mortar. It had deeper foundations than usual and was set in a wide trench, the latter being filled up with coarse gravel on either side. Mixed with the gravel on the inner side of the wall were numerous tiles. The gravel was embedded in the white mortar in some places, the latter having been so lavishly used, as to pour off the edges of the wall and to overlap the gravel, which was obviously being shovelled in at the same time. The top of the wall appeared to have been deliberately levelled. The west and south walls had been badly robbed, leaving only footings, consisting mostly of mortar debris. The footings of the south wall were followed for a length of twenty-five feet, beyond which point they had been cut by the gravel pit ; on the other side of the pit, thirty feet away, similar footings, still in line with this wall, were seen in the gravel face. It appears probable that other rooms existed east of Room xv ; alternatively, the south wall of Room xv may have continued as a boundary wall to a courtyard.

The plan of the hypocaust system differed from that of Room xiv ; the main flue, eighteen inches wide, ran straight across the centre of the floor and returned by narrower branching flues along the sides of the room. The furnace mouth had been robbed down to the bottom course of bricks, but most of the central flue was intact. The floors and walls of the flues were mortared, the walls being built of small flints except where bricks were used at the furnace. The floor of the main flue rose slightly towards its eastern end, where the side flues, nine inches wide, ran on a higher level till they reached their ends near the furnace ; here both ends had been deliberately blocked with flints set in mortar, as in Room xiv. The remains of an area, measuring twelve feet by nine feet, paved with bricks, was found lying outside the south-west corner of Room xv. Here were also the remains

of two crudely built walls, which suggests that this may have been a yard or some garden entrance.

Although the relative date of this period is clear, the evidence for its absolute date is meagre. It comes chiefly from the pottery found in Room XI amongst the débris thrown in when the hypocaust walls were inserted. Although earlier, even first century A.D. wares occur, there is nothing which need be attributed to the fourth century rather than to the third. Similarly in the gravel filling between the hypocaust walls of Room XIV a few sherds were found, but none is certainly later than c. A.D. 300. At Verulamium there was much rebuilding in the early fourth century, following a time of decay, and it seems reasonable, on the evidence available, to equate this period at the villa with the same time of revival under the Constantinian dynasty. The work of Period IX shows that Period VIII cannot have been long after the beginning of the fourth century.

PERIOD IX. *Destruction of stairway. Filling of staircase well. Blocking of cellar doorway. Filling of hypocaust in Room v*

About a generation after the reconstruction of the house which took place in Period VIII, it was found necessary to block the western doorway into the cellar, dismantle the staircase and fill up the staircase well. Whether this was due to decay of the staircase, or merely to the greater convenience caused by the use of the ramp for carts to reach the cellar at its eastern end (p. 50), or again to the collapse of the arch over the western doorway could not be ascertained. Perhaps all three contributed to the work, but a support of the last theory is that the blocking was carried into parts of both door jambs and even into part of the wall beyond the southern door jamb, evidently filling up more than the actual width of the earlier doorway itself. Since a collapse of the arch over the door would affect the walls of the house above, it is only to be expected that the extra support given by the blocking would strengthen the building.

The blocking wall, eighteen inches wide and seven feet high, had a good face only towards the cellar and was roughly built against the rubbish thrown in to fill in the staircase well (pl. VIII). The wall was mainly built of flint with irregular brick courses, but it also contained chalk blocks and large rounded river pebbles and broken tegulae. The whole was set in a friable yellow sandy mortar, very liberally used at the back. As the filling up of the staircase well was carried out at the same time as the erection of the blocking wall the two operations will be described together.

The section of the filling (fig. 5, Section G-G) gives a clear picture of the various tips of building débris, burnt layers and others, thrown in from the west side, gravel having been deposited first on the clay floor of the well. The wooden horizontal beams had either rotted or been removed, the western beam slot being filled up with flints. The slot for the door sill was filled with part of a burnt layer, to be described, and the other two slots with gravel. A large amount of building débris, containing flints, broken bricks, tegulae, imbrices and masses of mortar was thrown in and must have been carted from some part of the house that was undergoing alteration. Some of the mortar came from the underside of imbrices and had remained in large lumps still showing the form of an imbrex. At the bottom of the two layers of building debris there was a deposit of tegulae broken into very small pieces, which seems to suggest direct removal from building collapse, where the broken roof-tiles lying on top would become the bottom layer, when removed to the rubbish pit. The topmost burnt layer contained most of the smaller finds, such as the few coins, bone pins, iron objects, nails, glass, oyster and mussel shells, red brick tesserae and part of a quern of Niedermendig lava. It sloped down from top to bottom across the staircase well and was the last layer of debris to be thrown in before the blocking wall was started. It filled the beam slot of the now removed door sill and the blocking wall was built partly on top of some of it. The wall was carried up against it to a height of two feet six inches with a thick coating of the sandy mortar, the latter becoming so thick, that it lay like a shelf on reaching the top of the burnt layer. From this mortar shelf the wall was erected in a slightly better manner for four feet without the same liberal use of mortar, and towards the top the wall became wider, to correspond with the existing walls above. The rubbish accumulated against the wall as the work proceeded. Fallen

flints were found in the 'soft brown filling', which accompanied the building of the middle portion of the wall, and suggested that the mason, standing within the cellar, did not trouble to retrieve any stones that fell from his grasp into the accumulating rubbish at the back of the wall. Near the surface of the filling the 'dark brown earth layer' covered a large part of the corridor north of the staircase well as well as a part south of it. Many sherds came from the latter filling and near the south wall of Room ix many tesserae of the large coarse red brick type were found. Some of these were still in blocks, but as they were found upside down, they did not indicate a floor level. Large pieces of white-washed plaster were found in the 'light brown earth' filling near the surface, and a quantity of crushed plaster in the topmost filling.

Another work of this period, perhaps that which yielded the building debris in the filling of the staircase well, was the filling in of the hypocaust in Room v. The collapse of the cellar, described under Period VIII, may have damaged it so badly that the corn drying floor was disused, but it does not seem to have been dismantled and filled in until later. All the flues were deliberately blocked up with building debris, the furnace mouth was partly filled with earth and the stoking pit with more debris, containing a quantity of broken tegulae and imbrices. Only two small areas of the new floor remained, on the west side of the room, but these were enough to show its type. This was of crushed brick fragments, set in white mortar laid on a bed of fine gravel. In the filling of the main flue there were sherds of a mid-fourth century Castor ware box.

The trench dug for the rebuilding of the cellar wall in Room v, as mentioned above (p. 50), seems only to have been partly refilled at the time of the rebuilding. Later on, i.e. in Period IX, it was completely filled. At the eastern end, the filling of this trench was very loose and may have been disturbed. In it there were two coins, a barbarous *Fel. Temp. Reparatio* issue (no. 53) and what appears to be a '*minimissimus*' (no. 68), as well as some coarse red brick tesserae, oyster shells, bones, nails and half a bronze bracelet. Amongst the bones was the skull of a fox. In the top layer of building debris was a large amount of white plaster, probably from a ceiling. It was in big pieces and some of the pieces were wedged into upright positions, obviously rubbish from the ruined part of Room v, which had been disposed of into the nearest hole.

A floor, similar to that in Room v, was found in part of the southern half of the corridor adjoining Room xi, where crushed brick was set in white mortar, the latter two inches thick. This floor lay over the partition wall just south of Room xi, and was eight inches above the gravel layer of the corridor in Period VII (fig. 4, section F-F).

The only other work of this time was the erection of a new wall in Room vi, just north of the cellar. The wall was of a novel character, being built of small chalk rubble lying on a mixed foundation of small flints and broken bricks. The reason for its construction was not clear, but that it was later than Period VIII was seen by its straight joint with the east wall of the corridor, as well as by the overlap of the chalk on the offset of the latter wall. The only find of interest from the building debris, which filled the room, was a small block of coloured mosaic pavement, which, however, was not *in situ*.

Sherds and other finds came from all the various layers in the filling of the staircase well, but especially from the layers of 'coarse gravel', 'soft brown filling', and the topmost 'burnt level'. That the rubbish was deposited all at one time was shown by the fact that fragments of the same vessel were several times found in widely separated layers (figs. 18 and 19). The dating evidence from the pottery points to the end of the second quarter of the fourth century as the time of this filling; this agrees fairly well with the find of a silver coin of Constantine in fair condition, dated c. A.D. 320. Four other coins were found in this filling, but they were all of radiate issues of the third century, which in this context add nothing to the evidence of date for the deposit. The coin of Constantine was found at the bottom of the burnt debris layer at six feet depth from ground level. The Castor ware box, found in the filling of the hypocaust in Room v, confirms this dating.

END OF HOUSE

That the end of the cellar was sudden and by fire was shown by the debris of burning and collapse found lying on the cellar floor. As shown by a section through its filling

(fig. 5, Section J-J), a compact mass of debris lay on the floor, a layer burnt black and of varying depth was eighteen inches thick against the south wall. Most of the finds came from this layer, including six coins mentioned below. In several places on the debris, in addition to charcoal, there were the charred remains of oak timbers, probably joists or rafters. Above this was a thick layer of tegulae smashed to small fragments, the remains of the roof covering, lying concentrated towards the centre of the cellar floor. There must have been some lapse of time before the rest of the filling got into position in which it was found, because this included a mass of mortar from the walls with some bricks mixed in it. The mortar was mainly up against the south wall, but from the centre to the north wall was another mass, this time of plaster from ceilings; over all this was a layer of flints with an occasional brick due to the final fall of the walls. This layer of flints became deeper and the layers of mortar and plaster less as the west end of the cellar was cleared, and actually at the blocked western doorway the burnt debris on the floor had dwindled away to nothing. The fire seems to have started from the east end, as the small remaining portion of the yard there was also deep in burnt debris. From the section it will be seen that a certain amount of earth silt had fallen in on the north side of the cellar before the later collapses had taken place. The work of clearing the cellar involved the removal of nearly forty tons of debris.

Amongst the finds were many sherds, fragments of bronze, of articles so destroyed by fire as to be unrecognizable, iron nails, animal bones, oyster, mussel and whelk shells and the usual tesserae. Of the animal bones a large group of jaws and horn cores of ox, lying on the floor together up against the blocked west door, was of particular interest (p. 100). A large antler of Red Deer was found amongst the fallen flints. The most interesting find on the floor of the cellar was, however, a heap of charred wheat¹ and barley, which lay stretched across the floor from a slanting position against the north wall, suggesting that it had been in grain bags or other containers. Under the thickest deposit of it lay the remains of a coarse grey jar broken into fragments. At another point on top of the grain a thin trickle of minute particles of bronze ran down the debris suggesting the much-charred remains of a coin. The find of the corn helps to give a picture of the use to which the cellar was put, but the find of animal bones suggests that it was partly a larder as well.

The time at which this fire took place is closely indicated by the six coins (p. 60, nos. 6, 7, 8, 9, 15 and 16) found lying in the burnt debris. They serve to connect the end of the house with the raids of A.D. 367, but their significance has already been set out in full in Part I (p. 29). Since, as stated there, no later coins were found on the site, it is clear that all interest in the house, even in its agricultural aspect, was finished, the occupiers having fled or been mercilessly murdered in their beds. Except for Room v the rest of the house did not show signs of destruction by fire, but, having been deserted, seems to have fallen gradually into ruins. These ruins must have remained above ground for some considerable time, as bones of the skeletons of foxes in some of the hypocaust flues and elsewhere show that these channels were still available as lairs for wild animals.

Other evidence of the final catastrophe was seen in the find of a small hoard of coins (p. 60), seventeen in number, lying amongst the burnt debris over the southern flue of the hypocaust in Room v. Associated with the hoard was a large lump of copper (p. 66).

That a certain amount of brick and tile robbing was carried out was obvious, but this probably took place at a much later date, such as during the hunt for material for the building of St. Albans Abbey.

Finally this report has been greatly enhanced by the happy inspiration of Dr. Norman Davey, in consultation with Mr. Ian Richmond, in illustrating by means of isometric drawings two phases of the villa's life, during its prosperous periods in the second and early fourth centuries (fig. 6).

Note

The evidence for dating two of the walls at the northern end of the villa, which have been left blank on the plan (fig. 3) was not clear, due to the destruction of most of that portion of the site before excavation began.

¹ Professor J. Percival, M.A., Sc.D., states that the wheat is an early form of bread wheat (*Triticum vulgare*).

Further work by the mechanical grab to the south of the site exposed evidence of two slight ditches running parallel to each other from east to west. The ditch nearest to the villa lay at a distance of thirty-three yards and was V-shaped in form, the other was of round-bottomed form and was forty-three yards from the villa. Though watch was kept on the gravel digging the ditches did not extend for any great distance. Both had fragments of Roman tiles in their earth filling.

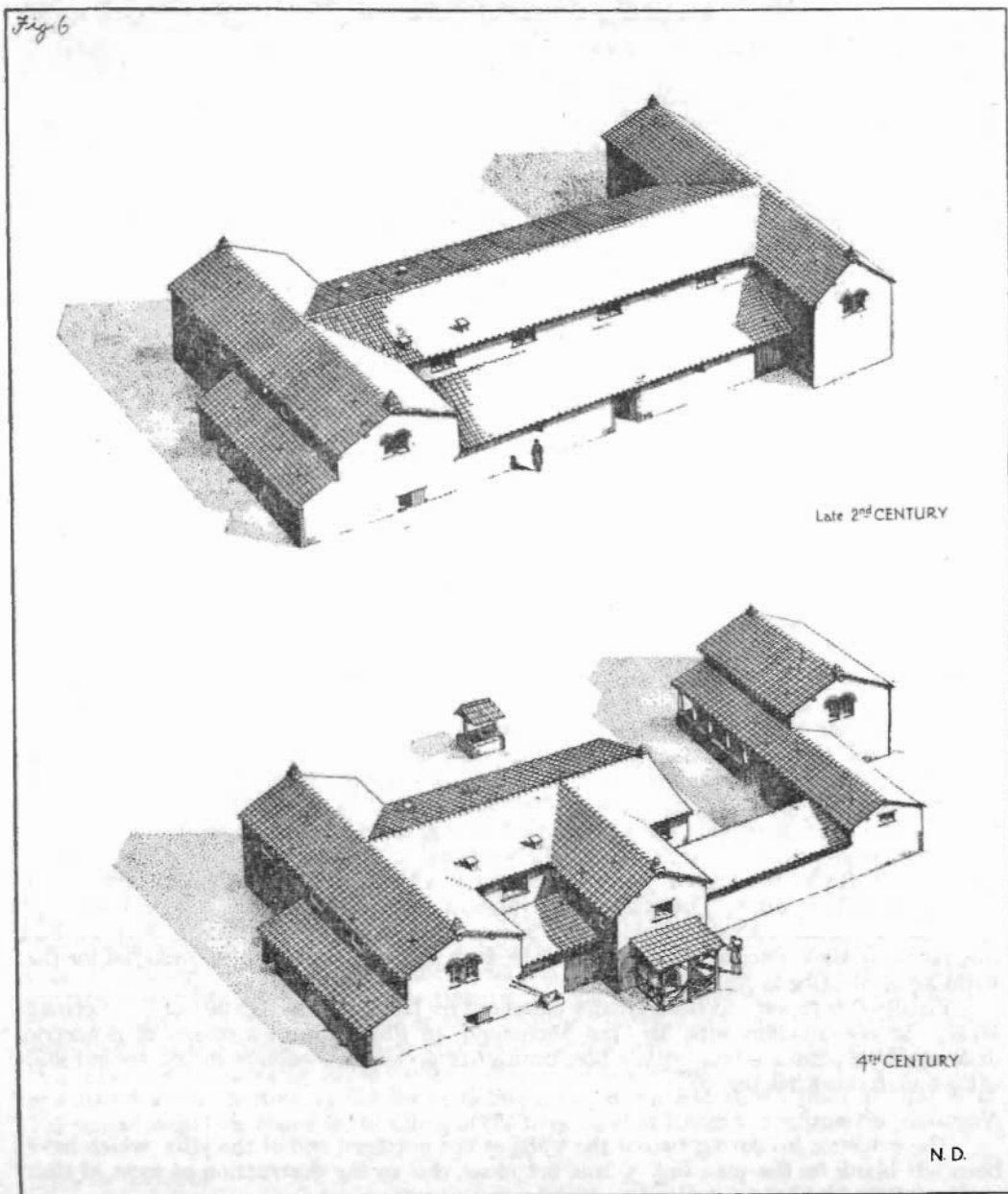


FIG. 6. RECONSTRUCTED VIEWS OF THE PARK STREET VILLA IN THE LATE 2ND AND THE 4TH CENTURY, BY DR. NORMAN DAVEY

PART III: THE FINDS

(All the finds have been presented to the Verulamium Museum, St. Albans, by the Ministry of Works on behalf of the owners of the site, Messrs. Inns & Co. Ltd.)

COINS

By B. H. St. J. O'NEIL, M.A., V.-P.S.A.

Amongst the coins there are a number which, either individually or by their association, are of particular numismatic interest.

Foremost amongst these is the coin of Constantine I with reverse *Victoriae Laetae Princ. Perp.*, a common bronze type, which in this specimen is completely covered with silver wash. From time to time issues of this period, normally of bronze, have occurred with traces of silver wash, but, as Mr. H. Mattingly has commented, those completely so covered are rare. Upon the decision of the question whether or not these coins were originally tariffed as part of the silver or of the bronze currency depends the present opinion of the value of the coins in ancient times. More evidence must be forthcoming before a reliable verdict can be passed.

As mentioned above (p. 56), this coin was found amongst the filling of the staircase well. This filling was all deposited at one time; it was certainly not a gradual accumulation over a long period of time. On the other hand it is possible that some of the rubbish had been lying about elsewhere for some years before it was deposited, where the excavators found it. With this caution in mind, it is legitimate to point out that all the other coins found in this deposit, beside that of Constantine I, already discussed, are radiate crowns minted c. A.D. 270. The evidence of the pottery found with them suggests a date of c. A.D. 340 for the deposit of the filling of the staircase well. Unless, therefore, they had all been lying about in rubbish elsewhere for forty to seventy years, these radiate crowns must have been in common circulation along with normal Constantinian issues in the first half of the fourth century. It follows from this that any official attempts at demonetization early in the century can have had but partial success. It also follows that at least in certain districts radiate crowns would have been available for barbarous imitation at least in the middle of the fourth century, and, if they were available then, they are likely to have been available later in the century.

Reasons have been given in the appropriate place for dating the end of the villa to the time of the barbarian raids of A.D. 367. The chief reason is a numismatic one, namely that, had it occurred later, at least a few of the very common Valentinian issues must surely have been found during the excavation. At the risk of seeming to move in a logistic circle, this dating argument will now be used to assist numismatic studies. In other words it will be taken as proved that there is nothing later at the villa than A.D. 367, and the collection of latest coins found will be examined in detail.

Of the seventy coins found no less than forty-three are of Constantius II or Constans. Of these forty-three, twenty-two are regularly-minted (A.D. 348-61) *Fel. Temp. Reparatio* types with legionary spearing fallen horseman, nine are barbarous copies of the same type, and two other such barbarous copies are overstruck on earlier issues. From this it follows first that at this site barbarous copies of this type could be almost, if not quite, contemporary with the legitimate coins. Evidence to this effect has accumulated recently, especially since it was noticed by Mr. J. W. E. Pearce to be the case in the Lydney 1928 hoard.¹ Secondly it follows that the overstrikes were contemporary with these early barbarous imitations of this type. This was also noticed at Lydney,² but since the time of that excavation further efforts have been made to find the true significance of the overstrikes. On the main issue of the controversy³ the Park Street finds shed no light, but this much can be said, that they weigh heavily in the balance against the suggestion that they were coined by the Pictish invaders. *Ex hypothesi* this villa was destroyed at the time of the Pictish invasion. It can hardly be argued that two worn overstrikes

¹ *Lydney Report*, Research Reports Soc. Ant. IX (1932), 114-5.

² *Ibid.*

³ *Num. Chron.*, 1939, 266-83, esp. 281-2.

had already arrived there by that time in ordinary circulation; still less likely does it seem that the invaders themselves dropped them there.

There are two minute pieces of metal, apparently coins, which seem to resemble the 'minimissimi' found at Lydney.² If this interpretation is correct, numismatists must be prepared in future to find that they also were current by A.D. 367 and are by no means proof of a fifth century date.

Finally, there is the hoard of seventeen coins mentioned above (p. 57), found in the debris of the destruction of the house. The coins are entirely in keeping with a deposition or loss in A.D. 367 or at any date thereafter. All are very small coins, i.e. of 4AE size. One illegible specimen (no. 15) may be a radiate issue, perhaps of Tetricus II, very worn. The rest are all of the mid-fourth century or later. One (no. 29) appears to be of Constans with two victories type. Apart from three quite illegible but almost certainly fourth century issues (nos. 63, 64 and 65) the remainder are all of legionary spearing fallen horseman type. They are nos. 20, 32, 33, 34, 35, 39, 40, 41, 42, 43, 52 and 56; all of them are small, but only two of them are really barbarous. They call for no further comment until more is known of this issue.

The writer is much indebted to Mr. Harold Mattingly for assistance in cases of difficulty, to Mr. J. W. E. Pearce, also to Mr. Derek Allen for dealing with the British coin. Reference numbers of the earlier coins are those of Mattingly and Sydenham, *Roman Imperial Coinage*.

LIST OF COINS

A. BRITISH

Cunobelin

- Obv. CVN ϕ | BEL|IN Horned and bearded head left (Jup. Ammon).
Rev. C A M Naked horseman r. with round shield and short sword.
Bronze: Camulodunum mint; Evans, XII, 14.

B. ROMAN IMPERIAL

Vespasian (A.D. 69-79)

1. Obv. IMP CAESAR VESPASIAN AVG COS II|II Bust radiate r.
Rev. [PAX AVG] SC Pax stg. l., sacrificing out of patera over altar, and holding branch and caduceus.
Dupondius (Lyons mint). A.D. 72-73. M. and S. 740.

Commodus (A.D. 180-92)

2. Obv. M COMMODVS ANT| Head laureate r.
Rev. FORT RED Fortuna seated l., holding rudder on globe and cornucopiae.
Probably A.D. 186. M. and S. 469.

Gallienus (Sole reign A.D. 260-8)

3. Obv. [GALLIENVS] AVG Head radiate r.
Rev. VICTORIA [AET] Victory stg. l., holding wreath and palm.
Mint. Z| (Rome). Antoninianus. M. and S. 297.
4. Obv. GALLIENVS AVG Bust radiate, cuirassed r.
Rev. PAX AVG Pax stg. l. with olive branch and sceptre.
Mint. S | I (Siscia). Antoninianus. M. and S. 575.

Claudius II (A.D. 268-70)

5. Obv. IMP CLAVDIVS AVG Bust radiate, draped r.
Rev. PROVID AVG Providentia stg. l., leaning on column, holding baton and cornucopiae.
Mint. |XII (Rome). Antoninianus. M. and S. 86.
6. Obv. [IMP (C) C]LAVDIVS AVG Bust radiate, cuirassed r.
Rev. VIRT[VS AVG] Soldier stg. l. with branch and spear.
Mint. Illegible. Antoninianus. M. and S. 109/110.

Victorinus (A.D. 268-70)

7. *Obv.* AVCCVIIIORINVS P Bust rad., dr., r. (good head of Victorinus).
Rev. . . . I J T | O 9 V I . . . Female figure l., holding long caduceus and cornucopiae.
Mint. A | A Antoninianus (semi-barbarous).

Tetricus I (A.D. 270-3)

8. *Obv.* IMP C TE[TRICVS]. Bust radiate, draped r.
Rev. [S P E]S PVBLI[CA] Spes moving l., holding flower and raising robe.
 Antoninianus. M. and S. 136.

Tetricus II (A.D. 270-3)

9. *Obv.* C PIV ESV TETRICVS CAES. Youthful bust radiate, draped r.
Rev. COMES AVG Victory stg. l., holding wreath and palm.
 Antoninianus. M. and S. 224.

Tetricus I or II (Barbarous)

10. *Obv.* Meaningless, indecipherable letters, but bust of Tetricus I or II radiate r.
Rev. S Spes moving l., holding flower and raising robe.
 Antoninianus. Type of M. and S. 130/136.

Carausius (A.D. 287-96)

- 11-12. *Obv.* IMP CARAVSIVS P F AVG Bust rad., dr., cuir. r.
Rev. PAX AVG. Pax stg. l. with olive branch and vertical sceptre.
Mint. $\frac{1}{\text{TTTT}}$ Antoninianus. M. and S. 880.
 13. *Obv.* IMP CARAVSIVS PF AV Bust radiate, draped r.
Rev. V O N S T A V II Pegasus l.
 Antoninianus. (Semi-barbarous.)

Radiate Crowns

14. *Obv.* Illegible, but radiate bust r., probably Tetricus I.
Rev. Illegible.
 15. *Obv.* Apparently radiate bust r., possibly of Tetricus II.
Rev. ? Sacrificial implements.
 16. *Obv.* and *Rev.* illegible, but probably of late third century date.

Constantine I (A.D. 307-37)

17. *Obv.* IMP CONSTAN | TINVS AVG Bust helmeted, cuirassed left with spear over right shoulder.
Rev. VICTORIAE LAETAE PRINC PERP Two victories facing, holding on altar a shield inscribed VOT PR.
Mint. PTR (Trier) 3Æ in size and type, but entirely coated with silver wash (v.p. 59).
 18. *Obv.* CONSTANTINOPOLIS Bust of Constantinople helmeted l.
Rev. Victory going l.
Mint. PLG (Lyons). 3Æ. A.D. 330-7.

Constantius II (Augustus A.D. 337-61)

- 19-21. *Obv.* D N CONSTAN | TIVS P F AVG Bust diad., dr., cuir. r.
Rev. FEL TEMP REPARATIO Legionary spearing fallen horseman.
Mint. ? $\frac{1}{\text{TTTT}}$ (Rome) + two illegible. 3Æ. A.D. 348-61.
 22. *Obv.* CONSTAN | TIVS P F AVG Bust diad., dr., cuir., r.
Rev. As last.
Mint. TRS (Trier). 3Æ. A.D. 348-61.
 23-5. *Obv.* CONSTANTI | VS P F AVG Bust diad., dr., cuir., r.
Rev. VICTORIAE DD AVGG Q NN Two victories facing, each holding wreath.
Mint. $\frac{*}{\text{TRP}}$, $\frac{D}{\text{TRS}}$ (Trier), $\frac{P}{\text{TTTT}}$

Constans (Augustus A.D. 337-50)

26. *Obv.* [C]ON[STAN] | S P F AVG. Bust diad., dr., ? cuir., r.
Rev. [FEL TEMP REPARATIO] Legionary spearing fallen horseman.
Mint. Illegible. 4Æ size. A.D. 345-50.
- 27-32. *Obv.* CONSTAN | S P F AVG (One not certain). Bust diad., dr., cuir., r.
Rev. VICTORIAE DD AVGG G NN Two victories facing, each holding wreath.
Mint. TRS' (Trier), + one illegible. A.D. 341-5.

Constantius II or Constans

- 33-6. *Obv.* CONSTAN | Bust diad., dr., cuir., r.
Rev. [FEL TEMP REPARATIO] Legionary spearing fallen horseman.
Mint. ? TRS, TR/// (Trier) + two illegible. A.D. 345-61.
- 37-8. *Obv.* D N CON Bust diad., dr., cuir., r.
Rev. As last.
Mint. Illegible. 4Æ size.
- 39-41. *Obv.* Illegible, but bust diad., dr., ? cuir., r.
Rev. Portions of FEL TEMP REPARATIO legible. Type as last.
Mint. Illegible. 4Æ size.
- 42-9. *Obv.* As last.
Rev. Illegible, but legionary spearing fallen horseman.
Mint. Illegible. 4Æ size except one 3Æ. A.D. 348-61.
50. *Obv.* CO Bust diad., dr., r.
Rev. [V]ICTORIAE DD AVGG Q NN Type of nos. 22-23 (semi-barbarous).
Mint. ? 3Æ. A.D. 340-5.
51. *Obv.* CONSTAN |
Rev. Illegible.
Mint. Illegible. 3Æ good size, but only a piece of coin.

Constantius II or Constans (Barbarous Fel. Temp. Reparatio)

- 52-9. *Obv.* Illegible. Barbarous diademed head or bust r.
Rev. Illegible. Legionary spearing fallen horseman, one overstruck on ? Two Victories type.
Mint. + seven illegible.

Constantius II or Constans (Barbarous Fel. Temp. Reparatio Overstrikes)

60. *Obv.* Illegible. Barbarous diad. head r., overstruck on illegible type.
Rev. Illegible. Legionary spearing fallen horseman, overstruck on . . . D D AVG.
 Two victories type, as no. 25-30.
Mint. Illegible. 3Æ.
61. *Obv.* Illegible. Barbarous diademed head r., overstruck on GLORIA EXERCITVS.
 Two soldiers facing, between them two standards. *Mint.* (Trier).
Rev. Illegible. Legionary spearing fallen horseman, overstruck on CONST . . . with head obliterated.
Mint. Illegible. 3Æ.

Magnentius (A.D. 350-3)

62. *Obv.* ? [DN] MAGNEN | [TIVS P F AVG] Bust bare., dr., r.
Rev. VICTORIAE DD NN AVG Two victories facing, holding shield inscribed VO
 VT
 X
Mint. P T R (Trier). 3Æ.

Illegible Fourth Century A.D.

- 63-7. One has diademed head, four are quite illegible, but probably of fourth century by appearance.

Minimi (fourth century A.D.)

- 68-9. Illegible pieces of metal, 2.5 mm. in diameter, one certainly and other probably prepared deliberately for use; cf. Lydney 'minimissimi'.

FLINTS

The General Belgic Level yielded many flakes of flint which showed the usual signs of having been struck by human agency. Dr. K. P. Oakley, who has been kind enough to examine some of the flints, writes: 'Iron Age tools are by no means unknown but excavators tend to neglect them. We found several worked flints in the Belgic ditches at Wheathampstead. One can only guess at the uses to which they were put, but I suppose they might have been improvised tools for working or decorating wood, bone or leather.'

- Fig. 7, no. 1. Broad burin-like blade of black flint (unpatinated), with signs of use at the point.
 2. Narrow blade of pale brownish-grey flint (unpatinated), with shallow irregular notches along the margins indicating utilization.
 3. Spall from side of small cylindrical core of black flint (unpatinated).



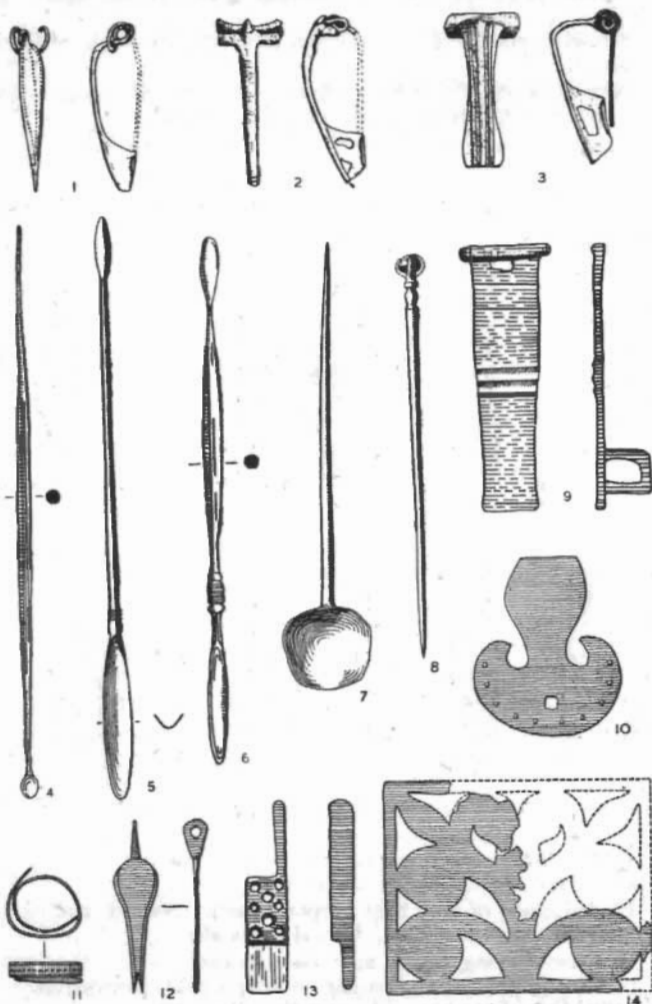
FIG. 7. FLINTS, FROM BELGIC LEVELS. $\frac{1}{2}$

4. Fluted blade of brownish-grey flint (unpatinated). Signs of utilization along one edge, possibly along both.
 5. Fluted blade of grey flint (unpatinated). Narrow end squared and utilized. Signs of utilization along lateral edges also.
 6. Narrow curving blade of brownish-grey flint (unpatinated). The rough burin-like facet at the bulbar end is probably accidental. There are signs of utilization along one edge near the other end.
 7. Broad spall from core of brownish-grey translucent flint, retaining patch of original cortex which is thin, buff-coloured and apparently not 'water worn'.

BRONZE OBJECTS

- Fig. 8, no. 1. Brooch of so-called 'poor-man's' type, decorated with longitudinal rows of punched dots. Cf. Verulamium Report (fig. 43, nos. 1 and 2) and Hambleton Valley, Bucks (*Archaeologia*, LXXI, p. 191, fig. 20). Characteristic of the second half of the first century A.D.; but here closely associated with a coin of Cunobelin (v. p. 34).

2. Brooch with spring cast with bow and pierced catchplate. Cf. Verulamium Report (fig. 44, no. 22) and Hambleton Valley (I, c, fig. 22). Latter part of the first century A.D. Found in Rubbish Pit I, which contained material as late as A.D. 130-40.
3. Brooch of Langton Down type, for which see Lydney Report, pp. 71-4 and fig. 10. Early to middle first century A.D.; found in filling against the outside of the corridor wall erected in the middle of the second century A.D.

FIG. 8. BRONZE OBJECTS. $\frac{1}{2}$

4. Unguent spoon. From Rubbish Pit III.
5. Spatula. Found on dump of Rubbish Pit of late date, destroyed by the grab.
6. Spatula. Found on dump of Rubbish Pit of late date, destroyed by the grab.
7. Spoon with tin or silver wash on bowl. Found on dump of Rubbish Pit of late date, destroyed by the grab.
8. Pin with pale yellow glass ball at its head held in place by four claws. Found with brooch no. 3.

9. Hasp from box or casket. From Rubbish Pit iv.
10. Decorative ornament of thin sheet bronze with row of embossed dots close to its rounded end. From filling of staircase well.
11. Expanding ring. ? toe-ring.
12. Toilet article. Nail-scraper; two other similar examples were found. From Rubbish Pit iv.
13. Ward of iron key? From filling at south end of corridor.
14. Decorative ornament of thin bronze sheet. From filling of staircase well.

Bronze objects not illustrated.

Finger-ring of wire with six twisted loops as decoration. Cf. exact parallel from Wadfield Villa, Gloucestershire: Mrs. Dent, *Annals of Winchcombe and Sudeley*, facing p. 15. From filling of door-sill in staircase well, c. A.D. 340.

Fragment of circular mirror of speculum metal. Copper alloyed with more than 20 per cent. tin becomes brittle, but white and takes a high polish. Dr. M. H. Hey of the Department

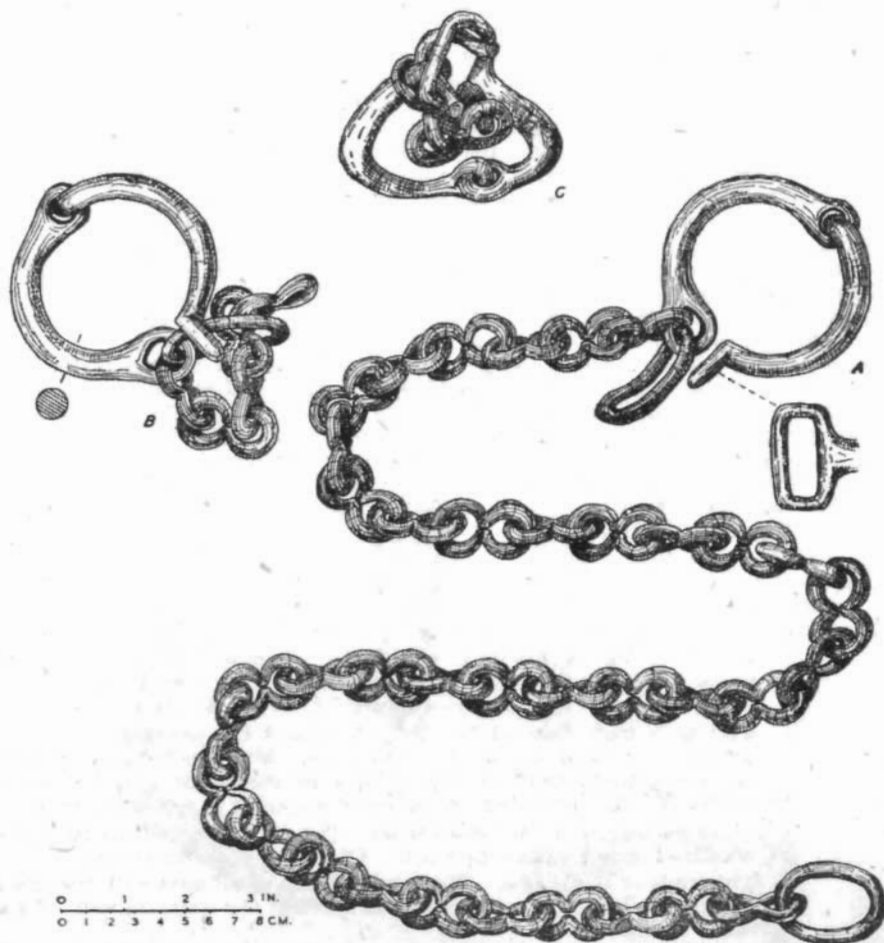


FIG. 9. IRON SLAVE-CHAIN WITH MANACLE. $\frac{1}{3}$

- A. AS ORIGINALLY MADE
- B. TO SHOW METHOD OF FASTENING
- C. MANACLE AS FOUND

of Mineralogy of the British Museum comments, 'Mirror of speculum metal, a tin-rich copper alloy. The ruby-red crystals among the weathering products are cuprite (cuprous oxide), and the green fibrous crust is a mixture of a little of the basic sulphate of copper (brochantite) with a much larger proportion of the basic carbonate of copper (malachite).' (Lab. No. V151.) From Rubbish Pit I.

Three needles, two and three quarters inches long, one only perfect with eye. From soot in stoking pit of Room XI.

Three nails, *c.* one inch long with hemispherical heads. One from ash on Chalk Floor I.

Bronze block, rough block of metal weighing three and three quarters pounds. Found with small hoard of coins in burnt debris in Room V. Dr. M. H. Hey comments, 'Block of metal, considerably weathered, with a crust of malachite and perhaps a little brochantite (not certain); below this is a friable layer of red cuprite. The main mass is soft and malleable, and from its ready complete solubility in nitric acid is probably copper, not bronze.' (Lab. No. V152.)

IRON CHAIN AND MANACLE (fig. 9)

The chain is composed of thirty-seven figure-of-eight links, each one and a half inches long, with a terminal oval ring, one and three quarters inches long, which could be attached to a person or object; the whole chain when extended, must have measured three feet four inches in length. The figure-of-eight links have clearly been made by pinching together the long sides of oval rings. At the end remote from the oval ring the chain is attached to a manacle. This hinged in the manner shown in the drawing. To one end of the manacle, which is in the form of a ring, there is attached not only the chain, but also a pear-shaped ring, of which for normal use the wider portion hangs free. The other end of the manacle is in the form of a narrow rectangular slot set at right angles to the plane of the manacle.

In its present corroded form—for the drawing is a 'restored' one based upon prolonged investigation—the chain is free, but the pear-shaped loop has been passed through the slot. It seems clear that the method of fastening the manacle round a wrist was by passing the pear-shaped loop through the slot and then passing the whole of the chain through the pear-shaped loop. Once locked in this fashion the manacle could only be unlocked by passing the whole chain back through the pear-shaped loop again.

Slave chains have been discussed and parallels quoted by Mr. R. F. Jessup (*Arch. Journ.*, LXXXIX, 108ff.) and Sir Cyril Fox (*A Find of the Early Iron Age from Llyn Cerrig Bach, Anglesey: Interim Report*), but they relate almost exclusively to chains for the neck. Manacles seem to be excessively rare. This example must have been thrown into Belgic Pit II within a few years of A.D. 43 (v. p. 35). As no slave chain has yet been closely dated in this country, it is important to emphasize in this case that, although it cannot be definitely proved to have been used and discarded before the Roman Conquest, its milieu is pre-conquest, and there is hardly any likelihood that it is a Roman import.

IRON OBJECTS

- Fig. 10, no. 1. Latch-lifter. From Rubbish Pit IV. The pit contained material of Belgic and early Roman date up to A.D. 70-80. A similar type of latch was found under the South-west gate at Verulamium and is considered to be of early Iron Age type. (*Verulamium Report*, Pl. LXV B, no. 21.)
2. Two nails from General Belgic Level (about the period of the conquest). Square cut; head and shaft in one piece. Many nails were found, mostly in very rusted condition. The shape of the heads varied considerably. The larger nail illustrated was found *in situ* lying in a charred beam.
3. 4. Three nails from Rubbish Pit III. The pit was closed not later than the middle of the second century A.D. Of similar make to above.
5. Two nails of *c.* A.D. 300. Many were found of all sizes with the remains of charred timbers in the corridor, just north of the staircase well. Of similar make to above.
6. Two nails of fourth century date. Found in the soot of the furnace to the hypocaust of Room XI. Some of the nails were recovered in a clean and unruined condition, probably due to severe burning.
7. Nail with wide head. 'Nut' in position at opposite end. From filling in staircase well, *c.* A.D. 340. Probably for use with roofing tiles.



FIG. 10. IRON OBJECTS. $\frac{1}{4}$

8. Nail with wide head. Found in débris on cellar floor. *c.* A.D. 367. Associated with fallen roofing tiles.

It will be seen from a study of the nails that they did not vary in type throughout the Belgic and Roman periods discussed in this report.

9. Linch pin. From Rubbish Pit III, which was closed not later than the middle of the second century A.D.
10. Wall-hook. Found in soot of furnace of hypocaust of Room XI. Fourth century date.
11. Spear-head? From Rubbish Pit I, which was closed *c.* A.D. 150.
12. Key. Found in filling at south end of corridor, *c.* A.D. 300. Solid shaft of square form with thin ward at right angles to shaft.
13. Iron scoop or soot rake, probably for cleaning the flues of a hypocaust, found resting on brick chips by Lime Slurry I.
The implement consists of an elongated scoop or blade, slightly curved in section, averaging five inches long and two inches wide, and bent at right angles to the handle. This has a tapering open socket, five and a half inches long, for the reception of a stout wooden pole about one and a quarter inches in diameter. To withstand additional strain the side of the socket opposite the scoop is prolonged as a flat strip, about half an inch wide, and at least one and a half inches long, up the back of the wooden handle, to which it was probably nailed through its upper end, which is wider than the strip. This is, however, broken off and its exact method of attachment is no longer apparent. The tapering socket has one stout nail or rivet in position in its back, four inches above the scoop. There are also two small holes in the back and one side of the socket, which may be the result of corrosion of the iron, but may equally well have been made for nails. It is suggested that the first wooden handle was held in place during fixing by the surviving nail and the strip prolongation of the open socket, while this was closed by hammering. The strain imposed on the wooden handle of such a heavy scoop would be considerable, and repeated contact with hot ashes would sooner or later necessitate replacement. The two holes mentioned above may have been made when such a replacement was affixed in the socket. The form of the scoop, which is asymmetrical, suggests use by a right-handed man. It could be used effectively in a flue seven inches or more wide, but too narrow for any other method of cleaning to be employed.

Amongst other iron objects found were the remains of choppers, five more keys, wedges, one measuring four and a half and another two and a quarter inches long, staples, one being one and three quarters inches wide, door hinges and window latches.

GLASS

By D. B. HARDEN, F.S.A.

The glass finds, though they include no complete vessels, give a very interesting cross-section of the types of glass that were current while the villa was in occupation, i.e. from the later first to the fourth century A.D.

None of the finer wares of earlier first century types, i.e. millefiori and polished monochrome bowls, were found, but there were several examples of first century ordinary green bottle glass (including the unguentarium, no. 22) from Rubbish Pit IV, which was closed in the Flavian period. This pit also contained fragments of window-glass.

Secure late first to early second century dating is available for the finds in Rubbish Pit I (closed A.D. 140) and III (closed A.D. 150). Among the glass in these two pits, apart from ordinary green bottles (e.g. no. 21), in which Pit III was particularly prolific, and window-glass, there were the polished amber bowl-rim (no. 1, fig. 11), fragments of four flasks or ollae with vertical pinched ribs on the body (nos. 14-17), the bowl-rim with scratched wheel-decoration (no. 3, fig. 11) and, most important of all, the bowl-fragment of fine Alexandrian colourless glass with papyrus-sprays cut in relief. As shown below, this piece is of the highest interest, not only as an import into Britain from Egypt, but

also, without respect to its find-spot, as one of the finest known specimens of Alexandrian crystal, for the relief-cut decoration of which no exact parallel can be cited.

The remainder of the glass cannot, from its stratification, be given any specific dating earlier than the fourth century A.D. It will be seen, however, from the catalogue, that on internal evidence it spreads fairly evenly over the second to fourth centuries. The largest

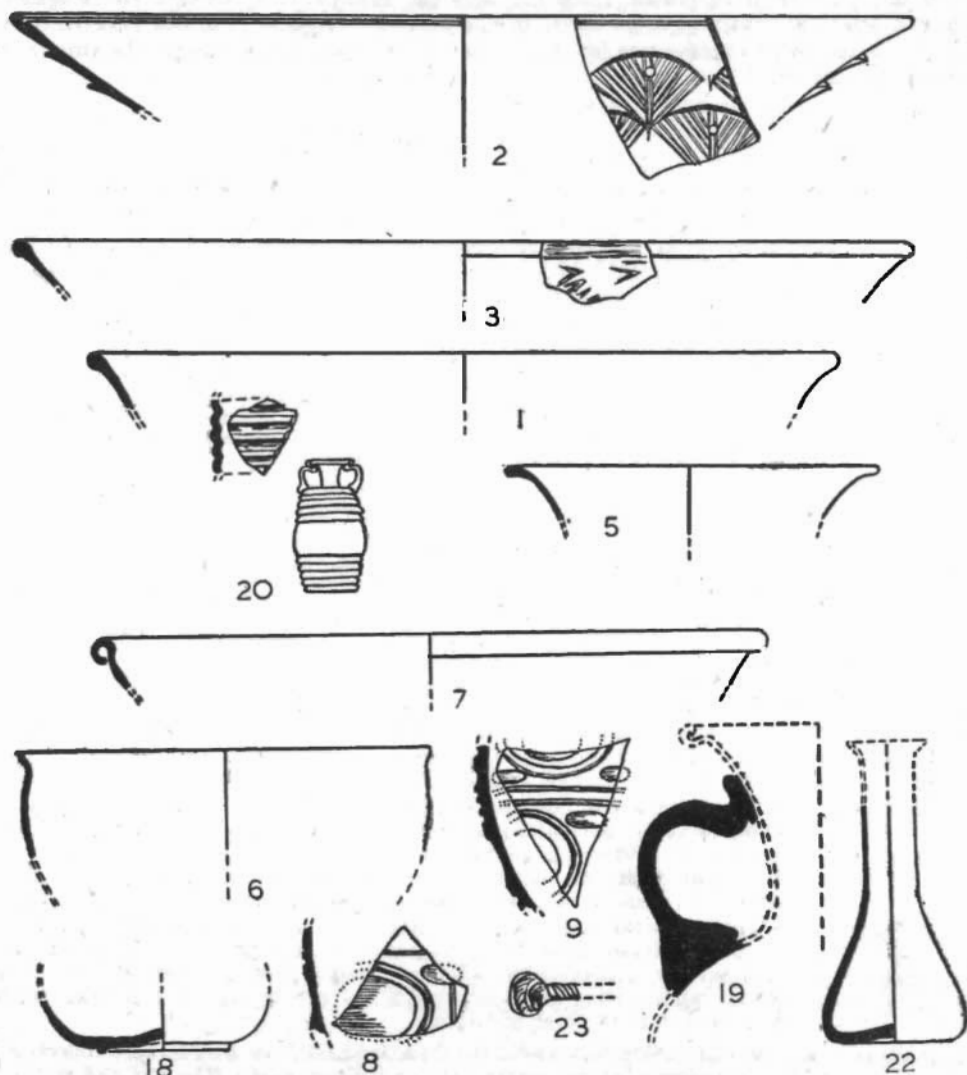


FIG. II. GLASS VESSELS. $\frac{1}{2}$

and most interesting group is that found in the Staircase well, which carries a closing date of A.D. 340. This contained a few bits of ordinary green ware, together with two fragments of colourless glass with facet-cutting (nos. 8-9, fig. II), a fragment of a colourless beaker (no. 10), two tiny fragments of a colourless flask with applied threads on the neck (no. 12), and a piece of a green barrel-jug (no. 20, fig. II). The only other group worthy of mention comes from Room v. This produced three appreciable fragments of one pane of window-glass, together with a colourless bowl and beaker (no. 6, fig. II), and no. 11 and a green

flask-base (no. 18, fig. 11). From Room XIII further large fragments of window-glass, including one with traces of cement on the rough-cast side, must be recorded; this site produced no fragments of vessels.

It will be noticed that many fragments of fine colourless ware have been found in this villa. A similar profusion of fine colourless wares has been recorded from the villa at Ditchley, Oxon. (*Oxoniensia*, i, 62 ff.), and the same is true, though the fragments have not been published, of other villas in the south of England (e.g. Chedworth, Glos.). Indeed, the use of fine glass-ware by the owners of these villas was clearly the rule rather than the exception.

CATALOGUE (FIG. 11)

- No. 1. *Fr. rim, bowl*, amber; rim rounded in flame, surface ground smooth on both sides. D. c. $7\frac{1}{2}$ inches. Probably first century A.D. Rubbish Pit I.
2. *Fr. rim, bowl*, fine colourless crystal with some pin-prick bubbles and flecks of white incipient weathering; on exterior pattern of papyrus-sprays cut in relief; on interior one horizontal wheel-cut line at rim; the whole surface finely ground and polished after the pattern was cut. D. c. $9\frac{1}{2}$ inches. Rubbish Pit III (Pl. IXa).

That the decoration consists of papyrus-sprays admits of no doubt if we compare it with the many illustrations of the papyrus-spray in Egyptian and Cretan art of 2000 B.C. and later in Sir A. Evans, *Palace of Minos*. Compare e.g. ii, fig. 287 (Eg. XII dyn.); ii, fig. 231 (Cretan, L.M. II); ii, figs. 264 and 285 and iii, pl. xx, figs. 65 f. (Cretan, M.M. III).

The fabric and papyrus decoration together prove conclusively that the piece is genuine Alexandrian work, imported into Britain from the east. Numerous pieces of similar crystal were found at Karanis in Egypt and published, with parallels from elsewhere, in Harden, *Roman Glass from Karanis* (Univ. of Michigan Hum. Ser., vol. xli (1936)). The fabric is that of Karanis fabric 1 or 2 (*ibid.*, pp. 21 ff.) the manufacture of which on Karanis evidence is to be dated during the second century A.D. (*ibid.*, p. 32). Other examples of this Alexandrian colourless glass have been found in the west, both in Britain and elsewhere (*ibid.*, pp. 45, 49-50, 66), e.g. the circular plate from Richborough (Bushe-Fox, *Richborough II*, 52, no. 77, pl. xxv), the bowl from Girtton, Cambs. (Hollingworth and O'Reilly, *A.-S. Cemetery at Girtton College*, p. 32, pls. xi-xii), and the bowl from Ditchley (*Oxoniensia*, i, 63 f., fig. 12, 1).

I know, however, of no exact parallel to this particular piece. The Karanis examples of cut ware of fabrics 1-2 (e.g. *Karanis*, pls. xiii, nos. 179 ff., xiv, nos. 311 ff., xv, nos. 408 ff.), are all normal hollow cutting without any attempt at raising the pattern into relief. So, too, are the figured and geometric cut wares of western (Rhenish) fabrication (e.g. *Niessen Cat.* (1911), pl. xxvi, nos. 324, 327, 330, etc.; Kisa, fig. 239, other than piece e, which is, I think, Alexandrian work, cp. *Karanis*, p. 139, fig. 3, b). There are, it is true, sundry glasses with relief-cut designs known from Roman times, though relief-cutting as a decoration is more typical of the Arab period. Of Roman date the best known are:

- The colourless crystal two-handled flask from the Merckens collection in Cologne bearing scattered lotus-buds in relief; Kisa, fig. 138, p. 639.
- The colourless crystal goblet from the Niessen collection, found in the Luxemburgerstrasse, Cologne, bearing ovals, circles and other geometric shapes cut in relief; *Niessen Cat.* (1911), no. 153, pl. xxv.
- The four-sided colourless crystal mug from Trier in Trier Museum, bearing an ivy-pattern, etc., cut in relief; Kisa, fig. 243, p. 639.

I have not had the opportunity of examining any of these three pieces, but from the illustrations it is clear that (a) certainly and probably also (b) and (c) are Alexandrian crystal and not of western workmanship. The nearest, from the point of view of design, to the Park Street fragment is the Trier mug; but it is not a close parallel.

3. *Fr. rim, bowl*, colourless; rim rounded in flame, surface ground smooth on both sides; decoration scratched with wheel on exterior. For the same V-decoration on a similar, but taller, bowl from Zugmantel cp. Fremersdorf, *Saalburg-Jahrbuch*, ix, 16 and fig. 2, 4. From its find-spot this piece cannot be later than mid-second century A.D., but scratched decoration of this type is usually third to fourth century. D. c. 9½ inches. Rubbish Pit III.
4. *Fr. base, bowl*, colourless, well-advanced white flaky weathering and iridescence; horizontal base with two concentric applied coils. For the type cp. *Saalburg-Jahrbuch*, ix, 15 and pl. VIII (the complete bowl-shape is shown on pl. x, 7). Second to third century A.D. Unstratified. Not illustrated.
5. *Fr. rim, bowl*, colourless, slightly iridescent; rim rounded in flame. D. c. 4 inches. Third to fourth century A.D. Unstratified.
6. *Fr. rim, bowl*, colourless with brown flaky weathering and iridescence; rim knocked off and ground smooth. D. c. 4½ inches. Third to fourth century A.D. Room v, filling of north arm of flue of hypocaust.
7. *Fr. rim, bowl*, dark green; rim folded outward and downward. D. c. 7 inches. Late third to fourth century A.D. In dark filling, Room XIII.
8. *Fr. body, bowl or beaker*, colourless, milky weathering; wheel-cut pattern of lines and oval facets. Second to third century A.D. Staircase well.
9. *Fr. body, beaker or flask*, colourless, milky weathering; wheel-cut pattern of lines and oval and circular facets. Second to third century A.D. Staircase well.
10. *Fr. side, cylindrical beaker*, colourless, milky weathering with incipient pitting on surface; one horizontal wheel-cut. Second to third century A.D. Staircase well. Not illustrated.
11. *Fr. side, thumb-beaker*, colourless with advanced brown weathering and iridescence. Third to fourth century A.D. Room v, filling of north arm of flue of hypocaust. Not illustrated.
12. *Fr. neck, flask*, colourless, milky weathering; two applied threads of similar glass on neck. Second to third century A.D. Staircase well. Not illustrated.
13. *Fr. base, flask or jug*, opaque brown (appearing black); applied base-coil of similar glass, fired in; pontil-mark on base. Bowls, etc., of similar metal occurred in the first century A.D. levels at Colchester (cp. Soc. Ant. *Camulodunum Ist Rept.*, forthcoming) and this is clearly Pliny's *obsidianum* glass (N.H. xxxvi, 197) as suggested by Thorpe in *Trans. Soc. Glass Techn.*, xxii, 11. Probably first century A.D. Unstratified. Not illustrated.
- 14-16. *Fr. body, three flasks or ollae* with pinched vertical ribs, one greenish-yellow, one bluish-green, one amber. Various body-shapes of such flasks—piriform, globular or squat ovoid—are known, all dating from the first or second century A.D., and ovoid ollae of parallel date are also common; cp. Thorpe, *English Glass*, pls. III, IV. First to early second century A.D. Rubbish Pit III. Not illustrated.
17. *Fr. body, flask*, as nos. 14-16, amber. First to early second century A.D. Rubbish Pit I. Not illustrated.
18. *Fr. base, flask or jug*, green; applied base-coil of similar glass; pontil-mark on base. D. c. 2½ inches. Third to fourth century A.D. Room v, robbed trench of north wall.
19. *Handle of flask*, green; body of similar glass, shape perhaps as sketched; cp. *Niessen Cat.* (1911), pl. xxxix, no. 473. The vessel almost certainly had two handles and perhaps four or six; such flasks with many handles are not uncommon in the later Roman period. Third to fourth century A.D. Room XI, filling of flue of furnace.
20. *Fr. barrel-jug*, mould-blown, green, showing the horizontal ribbing from top or bottom of body. The type may have one or two handles (cp. *Niessen Cat.* (1911), pl. xvi, nos. 164, 168, etc.; Kisa, pp. 786 ff., fig. 324; and, for an example found in Britain, Thorpe, *English Glass*, pl. 11b, from Milton-next-Sittingbourne) and was made in the late third century A.D. in the northern French factories of Frontinus and others whose signatures (Kisa, pp. 943 ff.) are moulded on the base. Staircase well.

21. *Fr. base, rectangular bottle*, heavy, green; three concentric circles and central dot moulded in relief on base. First to second century A.D. Rubbish Pit III. Not illustrated.
22. *Fragmentary body and neck, unguentarium*, dark green, bubbly glass; flattened base, triangular body merging gradually into cylindrical neck; rim probably plain-cut and not folded. H. of complete vessel c. $3\frac{1}{2}$ inches. D. $1\frac{1}{2}$ inches. Late first century A.D. Rubbish Pit IV.
23. *Head of toilet-stick*, drawn glass, dark green; twisted stem. L. of fragment $\frac{3}{4}$ inch. Probably third to fourth century A.D. Room XI, black layer in furnace of hypocaust.

NOTE ON THE ALEXANDRIAN GLASS FRAGMENT

By E. M. JOPE

This remarkable fragment of glass (fig. II, no. 2, Pl. IXa) was analysed spectrographically¹ and found to be a normal soda-lime glass, with a little magnesium and a trace of aluminium. Only a trace of lead was detected, and no tin. Its relative density, 2.47, agrees with the usual range of soda-lime glasses, about 2.3-2.6.

The full results of analysis appear in Table I. The presence of antimony is worth noting.² The fabric is colourless, probably because of the low iron content of the materials used for the frit, and not because of any added decolourizing material such as a manganese compound³: it is in fact doubtful if manganese is present at all in this specimen.

The elaborate petal contours of the exterior appear to have been formed by working the glass with an abrasive wheel and the grooves were probably similarly formed: the hollow spots at the centres of the petals were probably cut in before the grooves. The interior surface appears also to have been worked up with abrasive.⁴ Although the fabric contains many minute air-bubbles, when examined in polarized light it appeared very free from internal strain and had evidently been very well annealed. The surfaces show little sign of weathering. Altogether it may be regarded as an excellent example of glass working.

TABLE I
SPECTROGRAPHIC ANALYSIS

Sodium	Potassium	Lithium	Calcium	Barium	Magnesium	Aluminium	Silicon	Boron	Lead	Tin	Silver	Arsenic	Antimony	Iron	Manganese	Copper	Zinc	Chromium	Nickel	Cobalt	Vanadium	Titanium
L / M	O	?T	M	?T	T / M	T	L	T	T	O	T	O	T	T	?T	T	T	O	T	O	T	T

Explanation: Ritchie's scheme (*Technical Studies*, v (1937), 209) for presentation of data has been adopted.

L = large amount: silicon = about 30%.

M = of the order 10%-2%: Sodium=about 15%, and Calcium=about 5%.

T = trace, less than 1%.

O = not detected.

¹ For outline of the technique, see P. D. Ritchie, *Technical Studies*, v (1937), 209.

² *Ibid.*, vi (1938), 165.

³ A. Lucas, *Ancient Egyptian Materials* (London, 1926), 48-9, 52-3; D. B. Harden,

Roman Glass from Karanis (Michigan, 1936), 7; P. D. Ritchie, *Technical Studies*, vi (1938), 167.

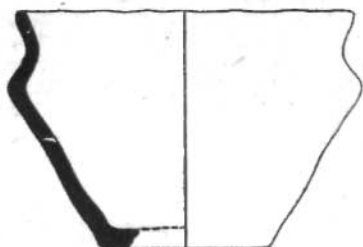
⁴ W. A. Thorpe, *Trans. Soc. Glass Technology*, xxii (1938), 12-13.

POTTERY

IRON AGE 2 A POT

Fig. 12

Sherds found in filling of central flue of hypocaust of Room XIV. About one half of rim and shoulder, and separate piece of side and base of same pot. In section the fragments almost meet, giving a complete profile. The pot is made of gritty grey ware, fired hard, with surface tooled smooth, the outside is light brown with grey patches. It is an open bowl with high angular shoulder and everted rounded rim. The body tapers sharply to the base.

FIG. 12. IRON AGE 2 A POT. $\frac{1}{4}$

DECORATED SAMIAN WARE (TERRA SIGILLATA)

By DR. FELIX OSWALD, F.S.A.

- Fig. 13, no. 1. Form 29, found unstratified during the digging of preliminary trial holes. Style of VITLVS. The rim is even lower than in the 29 by VITLVS at Silchester (May, *Silchester*, LXXXII, C; *O. & P.*, xxvi, 3). Large beads and the same continuous scroll with the same trefoil in the concavity. Almost certainly Tiberian.
2. Form 29 from the burnt debris in Post-hole 1, Room v. Very wide godroons, buff paste. Possibly Claudian, or even Tiberian, but insufficient remains for exact determination.
3. Form 29, lower frieze, from the clay level above Chalk Floor II of Room XI. The double ring with central dot is used by INGENVVS, MASCLVS, LABIO, STABILIO and MELVS. But of these potters only MELVS uses the little trefoil with swollen base, on a 29 stamped MELVS·FECI at Mainz (Knorr, *T. S.*, 1919, Taf 25). The double ring with central dot occurs on a 29 upper frieze at Vindonissa, stamped MELVS FE (Knorr, *T. S.*, 1919, 56 A). As this is the only case where both motifs are used by the same potter, there is a strong presumption that this is the work of MELVS, who certainly exported to Britain, though as yet he is only known on form 18, MELVS FECI at London (B.M. & G.H.). Claudius-Nero.
4. Form 37, from clay floor level in Room IV. Somewhat blurred, perhaps by careless extraction from the mould. The same ovolo as no. 8, which can be confidently ascribed to VITALIS, and the scroll is likewise similar, except that a cuneiform leaf takes the place of the central rosette on a spiral. A crouching dog to r. (O. 1963A, smaller variety) occupies the upper part of the arch of a continuous scroll; the lower part of the arch is marked off by a transverse wavy line and contains two rows of arrowheads, which are the same as on a 29 by VITALIS at Bregenz. In a 29 stamped VITAI at Vechten the same scheme occurs where the arch of a scroll is divided into two parts by a transverse wavy line. Vespasianic, c. A.D. 70-80.
5. Form 37 from Rubbish Pit 1. Ovolo and three-pronged tongue, bent to l. as on a 37 style of VITALIS at Rottweil. The same lion (O. 1400) as on a 29 style of VITALIS at London (G.H.), and similar pendent tendril and bud typical of VITALIS as on a 29 OF VITALIS at Vindonissa; and three-pronged arrow-heads occur on a 29 OF VITA at London (G.H.) It is probably by VITALIS of La Graufesenque. Vespasianic, c. A.D. 70-80.

6. Form 30 from Rubbish Pit 1. Good glaze and sharp modelling. Apart from the figure-types of a Bacchus (O. 563) and a Silenus carrying a basket of fruit (O. 592), the distinctive and characteristic details of the design are the basal ram's horn wreath, the arcades of two concentric arches on 'cross-gartered' columns surmounted by crowns with eight beads (which also

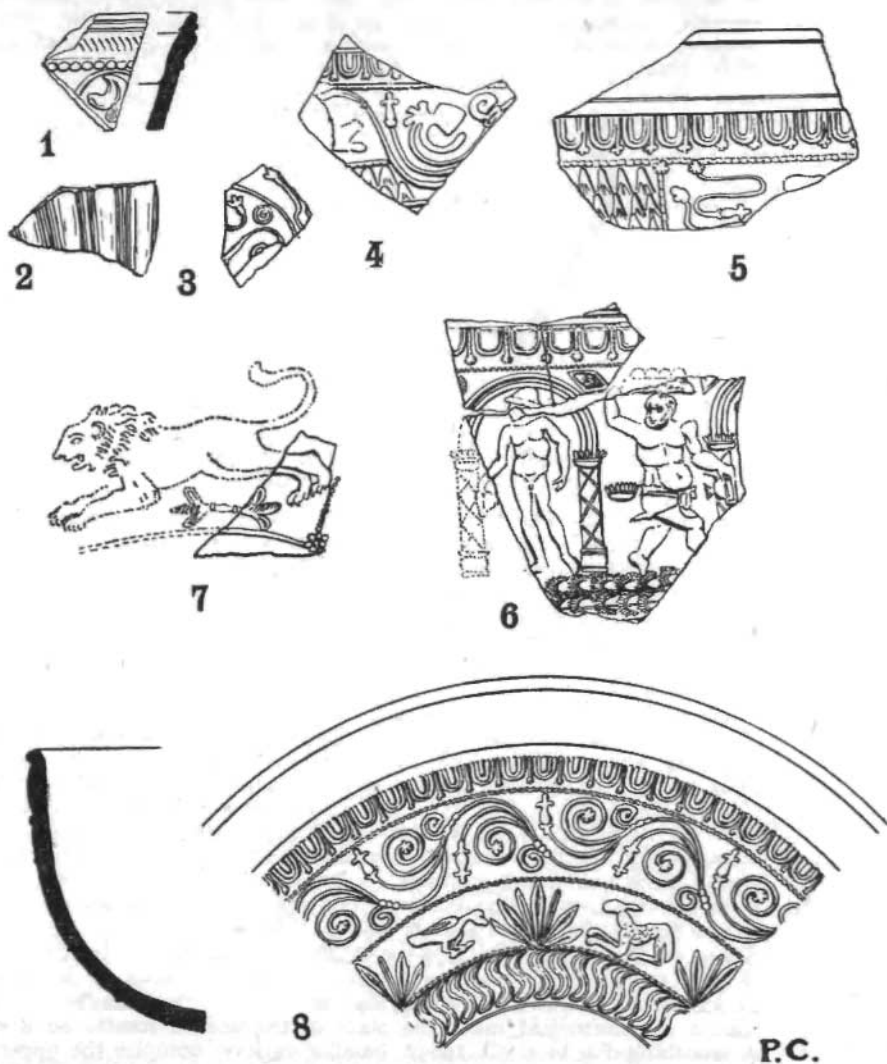


FIG. 13. DECORATED SAMIAN. $\frac{1}{2}$

occur free in the field), and a mask in a rhomboid frame, which is a small variety of the rhomboidal mask O. 1286. With regard to this mask, it seems only reasonable to presume that both the large and small varieties of this unusual type were used only by the same potter. Now the ram's horn wreath can be regarded as distinctive of the work of RANTO, for it occurs on a 37 at Rottweil (Knorr, *Rottweil* 1907, IX, 1), on which there is the distinguishing feature of a simplified acanthus supported by two cornucopias, a *motif* present on a form 29 from Hedderheim stamped RANTO F

retro. (Dragendorff, *Hedderheim. Mitt. IV, Taf. XXII.*) The Rottweil 37 also has crowns (with eight beads) free in the field and the same ovolo as in this Park Street 30, as well as swollen astragali. Furthermore, a London 37 (BM, Walters, CRP, M 1441), which possesses the basal ram's horn wreath associated with the acanthus of the RANTO 29, also displays the arcade with the double arch on 'cross-gartered' columns enclosing a figure-type, as in this Park Street 30. Finally, this 30 shows in an angle on each side of the arch the small mask in a rhomboidal frame already referred to. Now the larger variety of this rhomboidal mask (O. 1286) can be connected with the work of RANTO, for it occurs on a 37 in the London Museum which possesses arcades of double arches on 'cross-gartered' columns together with swollen astragali (as on the Rottweil 37 in the style of RANTO); in addition it shows helmets in the field, bow and quiver, and acanthus tips. Many of these details, e.g. the rhomboidal mask in its larger variety (O. 1286), the cornucopiae, swollen astragali, helmets, bow and quiver, 'cross-gartered' columns of arcades with double arches, etc., occur on a 37 at Cologne and have caused Knorr (*Festschrift f. r. Oxé*, p. 46, Abb. 4, 15) to ascribe this mode of decoration to his 'potter of the finest Sigillata', though he himself remarked on the similarity of his work to that of RANTO (op. cit., p. 45).

A 37 with the basal ram's horn wreath, 'cross-gartered' columns, and crown with eight beads in the field, from Vichy (St. Germain Museum) seems to indicate that Vichy was the original site of RANTO's pottery, though he may have subsequently moved to Chemery, where his characteristic work has been found (Delort, VII).

The figure of the Silenus with fruit-basket (O. 592) is so sharply modelled that it must have been an early example of this type. This circumstance and the presence in the Domitian camp of Wiesbaden of a 37 with some of RANTO's characteristic details (ovolo, swollen astragali, helmets, etc.) as well as his 29 at Hedderheim, induce me to put his period a little earlier than Dr. Pryce and I considered, viz. A.D. 90-100.

7. Form 37 from the brown layer in Rubbish Pit III. The hind legs are those of the lion (O. 1450) which occurs on a 37 style of DONNAVCS with his trefoil at London (Oswald col.). This trefoil is definitely his *motif* and it occurs, double, on a 37 with monogram of at DONNAVCS London (G.H.). This potter also uses the same rosette. Trajanic c. A.D. 110-120.
8. Form 37 found in the black layer in Rubbish Pit IV. The unusual design of the fan-tailed ornament is identical with that on a 29 OF VITA at Mainz, which also has a zone of small S-ornaments in series. The bird to r. (O. 2234) occurs on a 29 OF VITAL at Mainz. In particular the continuous scroll is identical with that on the upper frieze of a 29 VITALI at Nymwegen. The hare is O. 2104. It is an early 37, for the *motifs* are taken directly from form 29. It has a narrow plain rim, and the wavy lines (one above the ovolo) are much compressed. It is clearly the work of VITALIS of La Graefesenque and is Vespasianic, c. A.D. 70-80.
9. (Not illustrated.) Form 37, much corroded and blurred. Found in Rubbish Pit I. Decoration freestyle. The goat to left seems to be O. 1849 A, which is used by PATERVNS; this, however, is earlier, for beneath the goat is repeated series of the snake and rock (O. 2155), forming a consecutive lower border by itself. It is used in this manner on a 37 from Maldon (Colchester Museum) with CR (retro) below the decoration. This is clearly by CRICIRO of Lezoux, for on a 37 from London (BM), with CRICIRO (retro) inscribed beneath the decoration, we find the same lion and stag over the snake and rock as on the CR bowl from Maldon. A.D. 130-140.

Fig. 14.

Form 37 from Rubbish Pit v in Room v. The large double ovolo and tongue with rosette terminal is not separated by any wavy line or bead-row from the decoration. This is in panels of varying width, divided by fine wavy lines, each with horizontal astragali at the top, transverse astragali half way down and a \odot monogram at the base, which is demarcated by two ridges, a thick above a thin. The figures in the panels are, from left to right, Pan (O. 708); next a new type to me, rather blurred, possibly a

Hercules; then Diana (O. 107); Pan (O. 718A); Faun with wine-bag (O. 627); Silenus (O. 606); Diana again (O. 107); and Pan again (O. 718A). It is the work of AVSTRVS of Lezoux with his QD monogram at the base of his wavy lines, his ovolo and transverse astragali, and in particular the double ridges, one thick and one thin. This is characteristic of his work at Lezoux (as on a mould I obtained there) and does not appear on his later

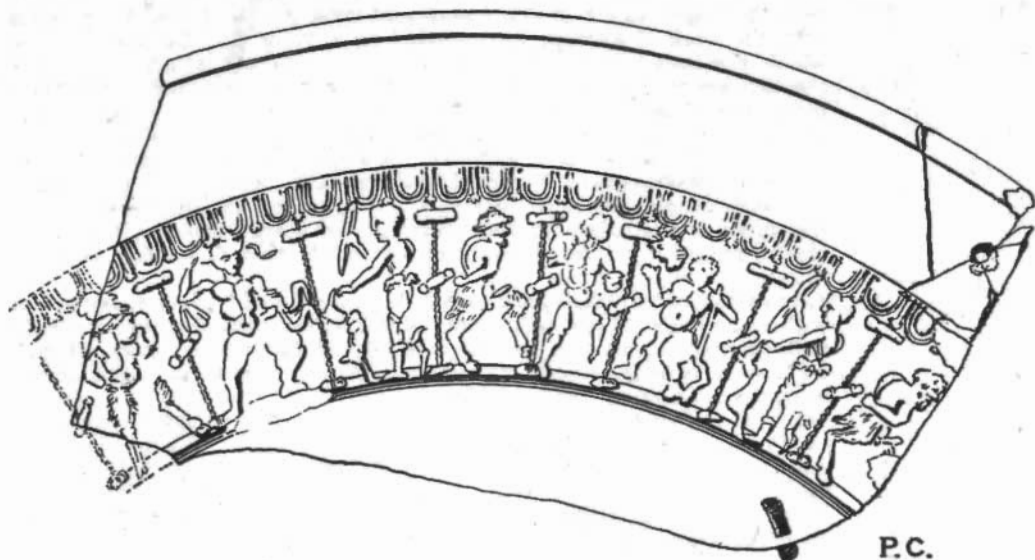


FIG. 14. DECORATED SAMIAN. $\frac{1}{2}$



FIG. 14A. PROFILE OF BOWL FIG. 14. $\frac{1}{2}$

work at Blickweiler with his QD monogram. His Lezoux ware sometimes has the stamp AVSTRI-OF in addition to the QD at the base of his wavy lines as at Vechten, Rouen, Lezoux, London (BM), but the Blickweiler examples only have the QD , with several of his types. I think this example (with its wavy lines) would be datable about A.D. 115-120.

The surviving piece, about a third of the bowl, has been broken and repaired in antiquity, one rivet being still in position. It must therefore have remained in use for some time after its manufacture.

POTTERY FROM STRATIFIED DEPOSITS

By PHILIP CORDER

FIG. 15. STRATIFIED POTTERY FROM PERIODS IV AND V.

Everything in this group may confidently be assigned to a date before the Boudiccan revolt of A.D. 61. While several of the vessels, e.g. 4, 6, 7, 8, 10, 17, 20, may be of pre-conquest date, others, e.g. the Samian forms, 1, 2, 3, are certainly Claudian imports, or show Roman characteristics, e.g. 9, 18, 19. The whole group representing the Period IV occupation probably falls within the first half of the first century A.D.

Period IV, Nos. 1-20.

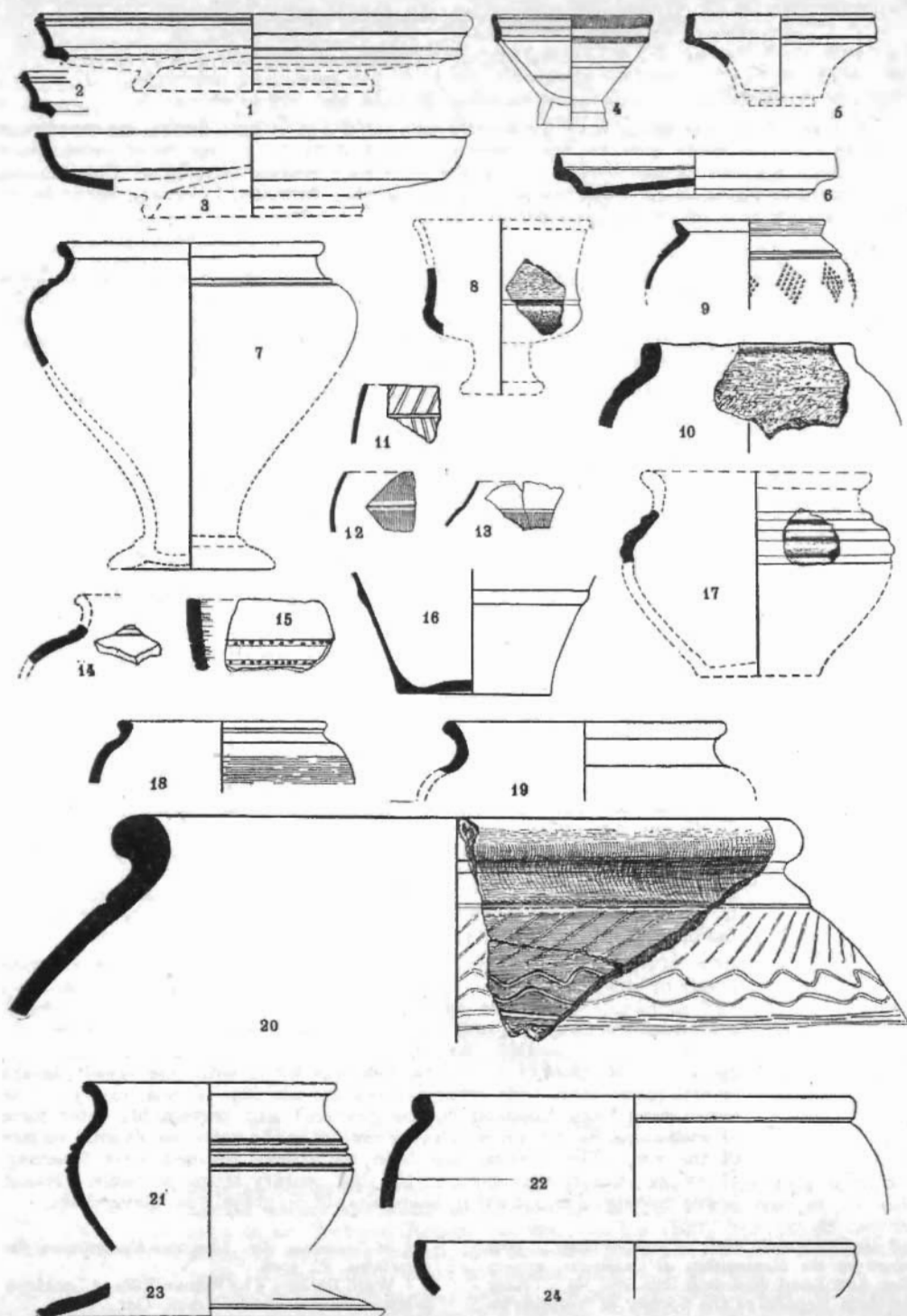
- Fig. 15, no. 1. Samian platter of form 15/17, almost identical with a platter from Verulamium Insula xvii (*Arch.*, xc, fig. 5, 5), which is of Claudian date. This form of platter is typical of the earliest occupation of London and Verulamium before the Boudiccan revolt. At Colchester (*Cam.*¹ s6B') it occurs first at the conquest. From silt level of Belgic Pit II.
2. Samian platter closely similar to no. 1 and also Claudian. From silt level of Belgic Pit II.
3. Samian platter of form 18 in good South Gaulish ware. The rim is flat and slightly grooved on the upper surface. There is also an internal offset. Both of these are Claudian features. Cf. *O. & P.*, pl. XLV, 7. At Colchester (*Cam.* s8B) it is rare before A.D. 48. From silt level, Belgic Pit II.
4. Samian cup of Loeschcke type 8a (*Hallern*,² Taf. xiv, Abb. 4, 2; *Verulamium*, fig. 11, 1 and 2; *Cam.* s11A). Found in the lowest spit in Rubbish Pit II, in the yard floor, it was not strictly sealed, but in the Belgic level. Probably not much later than A.D. 20, and almost certainly pre-conquest.
5. Small cup in hard smooth grey ware, derived from Loeschcke type 8, the commonest Arretine form at Haltern. Cf. *Verulamium*, fig. 13, 26 and fig. 23, 7 (A.D. 10-40). It also occurred in the second Belgic occupation at Lockleys,³ fig. 5, 6 (Claudian). At Colchester (*Cam.* 56) it was imported both before and after the conquest, and lasts until A.D. 61. From level of clay with flints, Belgic Pit II.
6. Belgic platter in hard light grey terra nigra. The profile is sharply moulded. Part of the maker's stamp in the centre of the base survives, but is illegible. Cf. Loeschcke type 72, Ba (*Hallern* Abb. 38, 6-7) and Ritterling type 97 Ab (*Hofheim*⁴ Taf. xxxvi). As the footring has not yet become superfluous as in the Hofheim example, this platter may date between the two. Cf. North Ferriby (*Ant. Journ.*, xviii, p. 265, fig. 2, 2) and Verulamium Insula xvii (*Arch.*, xc, fig. 11, 1). At Colchester (*Cam.* 8) it is found in all periods (c. A.D. 10-65), but reaches its maximum incidence A.D. 43-61. Found in the clay floor layer in Room III.
7. Vase in thin purplish brown ware with polished 'soapy' surface, showing traces of bitumen coating. A sharply defined cordon separates neck from high shoulder. The upper part of this vessel is reminiscent of the pedestal urns from the Belgic vaults at Welwyn (*Arch.*, LXIII, nos. 7, 8, 21 and 23). The first Belgic house at Lockleys also produced a pedestal urn (*Lockleys*, fig. 4, 1). No part of a pedestal foot was found with this vessel, though several pieces came from other parts of the site (fig. 16, nos. 12, 13). The vessel may have belonged to the devolved and presumably later form (*Verulamium*, fig. 16, 47) which it resembles in the flattened internal surface of the rim. The drawing has been tentatively restored after *Swarling*, pl. vi, 3. A date very early in the first century seems probable. Found in the bottom of Belgic Pit II, below the silt on gravel near slave chain.

¹ Hawkes and Hull, *Camulodunum: first report on the Excavations at Colchester 1930-9* (Soc. Ant. Lond. Research Rep. No. 14). Other Research Reports of the Society of Antiquaries are referred to by their site name only.

² *Mitteilungen der Altertums-Kommission für Westfalen*, V., 1909.

³ Ward Perkins, *The Roman Villa at Lockleys, Welwyn* (*Antiq. Journ.*, xviii, Oct., 1938).

⁴ *Annalen des Vereins für Nassauische Altertums-Kunde*, 1913.

FIG. 15. STRATIFIED POTTERY FROM PERIODS IV AND V. $\frac{1}{4}$

8. Sherd from a Belgic cup in smooth brown-grey ware, polished above the carination. It is a copy in native ware of a well-known form of Gallo-Belgic beaker, which occurs at Camulodunum in *terra rubra*. The imitations sometimes have the high tubular pedestal base, as, for example, the small beaker from the native site at Burnham, Bucks (*Records of Bucks*, xiv, fig. 1, no. 18 and p. 180), but as often the pedestal foot is lacking and is replaced by an omphalos base (*Richborough*, i, pl. xx, 3, or *Swarling*, pl. iv, fig. 2, from Deal). The drawing has been tentatively restored with a pedestal foot. This cup is not likely to be later than the Claudian period. From Belgic Pit II.
9. Well-made and sharply moulded beaker in drab ware. The everted rim, with flat interior, is tooled on the outside. A pronounced cordon marks the shoulder, below which the body is decorated with lozenges formed of regularly-spaced and carefully applied barbotined dots. At Colchester globular beakers (*Cam.* 108) do not appear before A.D. 43. Found in the trench under the chalk wall in Room VI.
10. Very coarse pot of brown to black hand-made ware with porridgy surface. There is no line defining the rim, which is rather flat on top. Somewhat similar bead-rim pots occurred in the first quarter of the first century A.D. at Maiden Castle (*Maiden Castle*, fig. 67, 123, 124). Found on Clay Floor B in Room v.
11. Sherd of yellowish-drab ware decorated with impressed grooves. Probably from the body of a butt-beaker. From clay with flints level, Belgic Pit II.
12. Thin rouletted sherd in yellowish ware, from the body of a butt-beaker. Cf. Verulamium Insula xvii (*Arch.*, xc, fig. 12, 41, etc.); *Verulamium*, pl. LV A, 3-6; *Lockleys*, fig. 5, 3. From clay with flints level. Belgic Pit II.
13. Two sherds from the junction of neck and body of a butt-beaker in fine white pipe-clay. Cf. Verulamium Insula xvii (loc. cit., pl. xix, c., 2-8), from the earliest occupation of the site. At Colchester (*Cam.* 113) they are found in all periods after A.D. 10, but reach their maximum incidence in the mid first century. From clay with flints level, Belgic Pit II.
14. Sherd of smooth black ware from the shoulder of a cordoned jar. Cf. *Verulamium*, type 45 (A.D. 10-40). From clay with flints level of Belgic Pit II.
15. Sherd from the body of a large vessel in smooth hard brownish grey, showing two girth grooves in which a series of tiny holes have been made before firing. These were made from the outside and each has caused a burr around the hole on the inside. No doubt the vessel was a strainer, although the holes are much smaller than is usual in such vessels. From clay with flints level, Belgic Pit II.
16. Base and lower part of a butt-beaker (?) in thin brown ware with 'soapy' black surface. A flattened cordon occurs $2\frac{1}{2}$ inches above the base. From Gully v, over Belgic Pit II.
17. Sherd with broad cordons from the shoulder of a jar similar to Wheat-hampstead type 11 (*Verulamium*, pl. L, 11) in reddish brown ware with smooth 'soapy' surface. This may belong to the closing years of the first century B.C., for the rippled shoulder occurs at Belgic Verulamium (A.D. 10-40) only in a flattened and debased form (cf. *Verulamium*, fig. 15, 44). At Colchester (*Cam.* 229) such jars are, however, found from before the conquest to A.D. 61. Found in Chalk Floor II, Room I.
18. Small jar in hard bluish-grey ware with faint striations on the body. Differing in ware from the bead-rim jars that occur sparsely at Verulamium in the period just preceding the Conquest and in the following quarter century, it shows the influence of the common furrowed Belgic cooking-pots. The ware is Roman rather than native, and a mid first-century date seems probable. From clay with flints level, Belgic Pit II.
19. Rim of a pot in hard granular black ware. Cf. Verulamium Insula xvii (*Arch.*, xc, fig. 11, 21) A.D. 45-55. Colchester (*Cam.* 221A) A.D. 10-65, but commonest A.D. 43-61. From clay with flints level, Belgic Pit II.

20. Huge wheel-turned storage jar in spongy red-brown ware, with smooth 'soapy' black surface. Decorated with a series of oblique rather faintly-impressed lines on the shoulder above two deep wavy lines. The body appears to have been furrowed. The grooved shoulder resembles Wheathampstead types 23-25 (*Verulamium*, pl. LI, 23-5) more closely than it does any of the large jars from Belgic Verulamium (cf. *Verulamium*, fig. 18, 60a and fig. 19, 60b), and a date late in the first century B.C. seems therefore probable. Close dating, however, of these large Belgic jars, which last well into the Roman period, is not yet possible. From General Belgic Level in corridor, opposite Belgic Pit II.

Period V, Nos. 21-24.

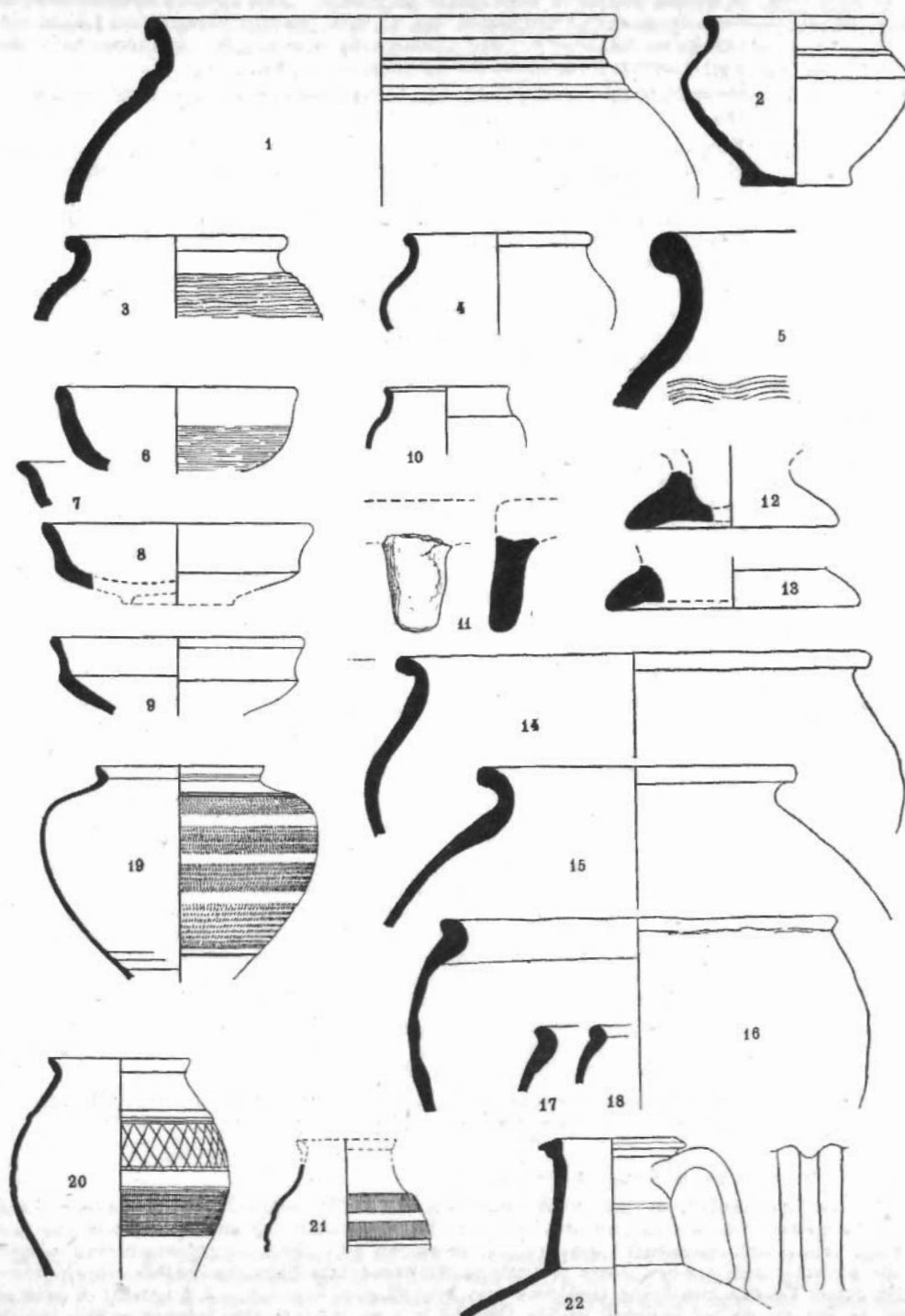
21. Bowl of hard red-brown ware, with unsmoothed porridgy surface. There are three very deep grooves around the shoulder that have caused burrs along their edges, but otherwise the body, though rough, is without the usual furrowing or combing. It conforms in general features to Verulamium type 61 (see *Verulamium*, figs. 19 and 20) and closely resembles fig. 9, no. 1, a jar from the packing of the original intermediate palisade A in Pond Field. It would appear to be a sophisticated version of Wheathampstead type 15 (*Verulamium*, pl. L, 15). It is unlikely to be much later than the Claudian invasion (*ibid.*, p. 166). From daub filling of Belgic Pit I.
22. Large vessel in purplish ware varying from grey to red-brown, with a very rough porridgy surface. At Colchester (*Cam.* 257) it is found from the conquest to A.D. 65. From daub filling of Belgic Pit I.
23. Lid in hard light-grey ware containing crystalline sandy particles. Cf. Verulamium Insula XVII (*Arch.*, xc, fig. 14, nos. 45, 49) dated A.D. 50-60. From filling on Chalk Floor I.
24. Small sherd from a shallow lipless dish in hard ware similar to the last two, and also with rough porridgy surface. From daub filling of Belgic Pit I.

FIG. 16. EARLY POTTERY FROM RUBBISH PITS I AND IV AND OTHER DEPOSITS.

With the exception of the pedestal bases nos. 12 and 13, all the pottery illustrated in fig. 16 is selected from the two large Rubbish Pits I and IV. Nos. 1, 3-8, 10, 11, 21 are from Rubbish Pit I, the latest Samian from which (fig. 13, no. 9) is dated by Dr. Oswald A.D. 130-140. Nos. 2, 9, 14-20, 22 are from Rubbish Pit IV. This pit was open at the same time as Rubbish Pit III (fig. 17) for pieces of the same vessels were found in both, but Pit III remained open longer, nothing being found in Pit IV that requires a date later than the Samian sherd (fig. 13, no. 8) dated A.D. 70-80. The pottery here illustrated has been selected to indicate the earlier phases of the occupation, and nothing that certainly requires a post-Boudiccan date has been included.

- Fig. 16, no. 1. Large urn in grey ware with smooth black surface overlying a reddish layer. The cordoned neck places it between Verulamium types 51 and 52 (*Verulamium*, fig. 17). Occurring first before the conquest at Colchester (Cf. *Cam.* 218) it reaches its maximum incidence A.D. 49-61.
2. Small cordoned bowl in gritty black ware with drab core. Cf. the local group made at Silchester (*Silchester*,¹ pl. LXXIX, 12 and 13) in the second quarter of the first century.
 3. Cooking-pot in ware similar to that of no. 1, with deeply furrowed shoulder. (*Verulamium*, type 61.)
 4. Shoulderless jar in hard grey ware with granular surface.
 5. Large store-jar (diameter 13½ inches) in gritty dull orange ware with flaky grey interior surface and smooth 'soapy' exterior. There is no shoulder but the upper part of the body bears deeply-grooved wavy lines (*Verulamium* type 60).
 6. Crude dish of gritty black ware full of crystalline sandy particles, rather faintly rilled on the lower part and sooted outside.
 7. Rim of dark brown dish with 'soapy' exterior.
 8. Native copy of Gallo-Belgic platter with corky grey surface and dark red-brown core.

¹ May, *The Pottery found at Silchester*, 1916.

FIG. 16. EARLY POTTERY FROM RUBBISH PITS I AND IV AND OTHER DEPOSITS. $\frac{1}{4}$

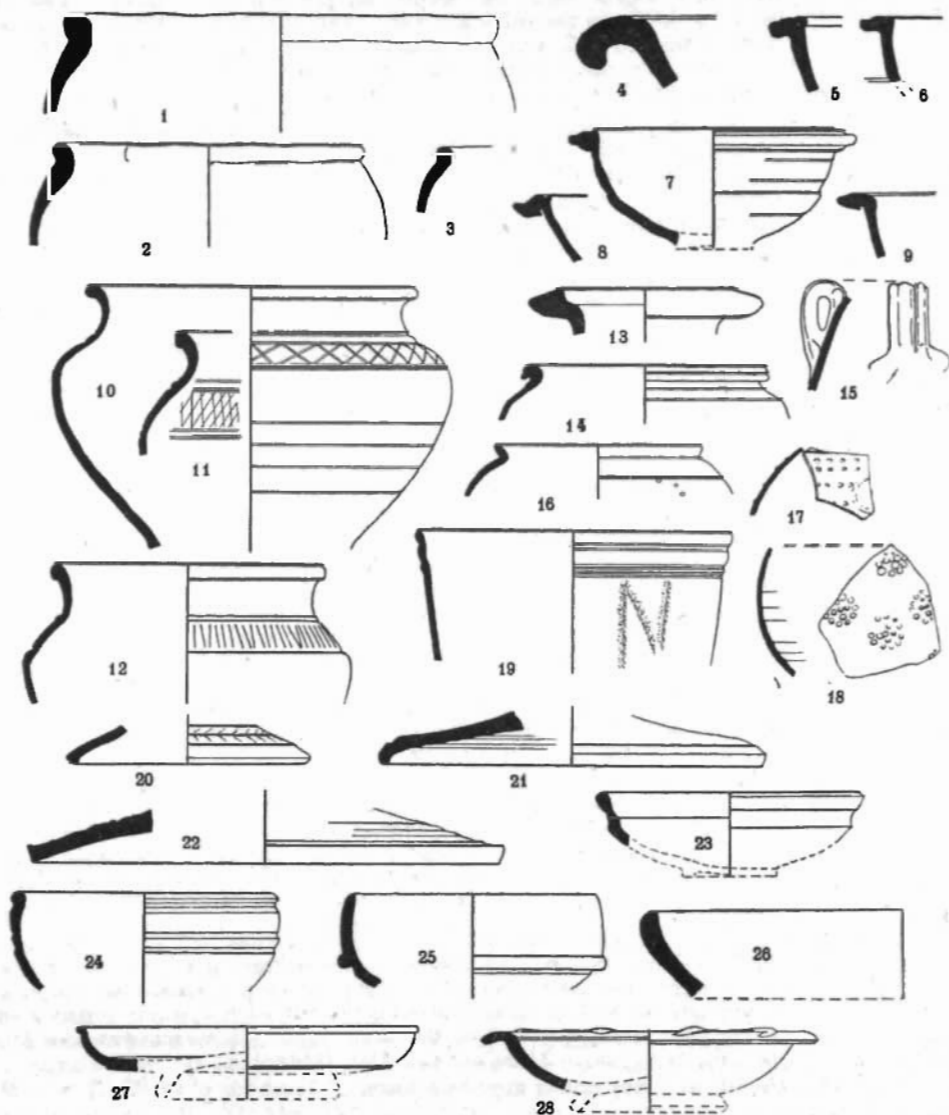
9. A similar platter in very coarse grey ware. This appears to be a common local type. Cf. *Verulamium*, fig. 12, nos. 19-24; *Verulamium Insula xvii* (*Arch.*, xc, fig. 11, nos. 5-8); *Lockleys*, fig. 5, nos. 7, 8. At Colchester (*Cam.* 21c) it occurs from before the conquest to A.D. 65.
10. Small light-grey beaker with black (bitumen?) coating outside and on the rim.
11. Roughly made leg of a pot-stand in orange to grey ware, similar to that of No. 5. Cf. *Records of Bucks*, xiv, fig. 2, p. 182, and *Ant. Journ.*, xxiii, 58, 59. It is possibly, however, the leg of a tripod bowl like *Cam.* 45.
12. Fragment of a pedestal base in soft red ware, the surface of which has perished. Found in the General Belgic Level, Period IV, in Room III with the indeterminate scrap of another.
13. Another similar in soft orange buff ware, the surface of which has perished. Found above the chalk floor in Room I, and therefore to be assigned to Period IV. Both the above are of the type of pedestal base that occurs at *Verulamium* (fig. 16, no. 49a, b, c) and *Lockleys* (fig. 4, nos. 1 and 3). At Colchester (*Cam.* 202) they occur after the conquest as survivals only.
14. Large jar in light pinkish buff ware, burnt grey in parts. It is entirely hand-made and very irregular in outline. The ware is soft and contains crystalline sandy particles.
15. Large jar in salmon pink ware with only the rim finished on a slow wheel or turntable. The paste contains some calcitic grit, but the exterior is hard and fairly smooth.
16. Large hand-made bead-rim bowl in coffee-brown to black ware, charged with grit and with sooted porridgy surface. It has an unusually pronounced thickening of the rim, which varies greatly in section so that no drawing can represent it accurately. A pre-conquest native form (*Cam.* 256a) that may be expected to survive in outlying districts.
17. Similar, but in light red ware of the same texture.
18. A smaller example of the same type in light orange-red ware, with the rim perhaps finished on a slow wheel.
19. Globular beaker in thin light orange-red ware. The whole body is covered with lines of fine rouletting demarcated above and below by double grooves, and leaving three plain bands around the body. This is an early form of globular beaker that at Colchester (*Cam.* 108) is uncommon before the foundation of the *colonia* in A.D. 49.
20. Small butt-beaker in rather soft pinkish-drab ware with light grey core. The decoration on the upper zone beneath a broad shoulder-cordon consists of well-defined lattice cut with a knife. Beneath the plain zone round the maximum girth are lines of rouletting separated by deep lines cut with a knife. The form of this beaker is nearer to that found at Augustan Haltern than to that common at Verulamium or Hofheim in Claudian times (see *Ant. Journ.*, xviii, fig. 4, p. 273). Cf. *Cam.* 112, A.D. 10-61.
21. Small butt-beaker in smooth dense drab ware, with greyish external surface. Sherds from two other beakers in similar ware were also found in the same rubbish pit. *Cam.* 119c, A.D. 43-65.
22. Jug in hard white ware with cylindrical neck and two-ribbed handle (or handles?). Cf. *Cam.* 150, A.D. 49-65.

FIG. 17. POTTERY FROM RUBBISH PIT III.

The earliest sherds from this pit are Belgic, e.g. the hand-made bead-rim bowls (nos. 1 and 2) or the native dish (no. 23), all of which may be pre-Roman. Roman pottery of the first century is also well represented (nos. 10, 11, 16-22, 27, 28). But the pit was certainly open in the second century, when wares of Hadrian-Antonine date from the neighbouring pottery ('Pit 6') at Verulamium found their way into it (nos. 4, 7, 8, 9, 13). A fragment of Samian form 37 (fig. 13, no. 7), assigned by Dr. Oswald to A.D. 110-120, also belongs to this group. Nothing later than the middle of the second century was, however, found in the pit.

Bead-rim Bowls.

- Fig. 17, no. 1. Hard light grey fabric with 'porridgy', somewhat vesicular surface. Body hand-made, rim perhaps finished on slow wheel or turntable.
2. Coffee-brown to black, entirely hand-made. Clay charged with calcitic grit which gives an uneven 'porridgy' surface that is 'soapy' to the touch. (*Lockleys*, fig. 8, 45, Claudian.)

FIG. 17. POTTERY FROM RUBBISH PIT III. $\frac{1}{4}$

3. Small fragment of another in similar ware though smoother and blacker. *Verulamium*, fig. 21, type 66 and p. 171, where the infrequency of bead-rims at *Verulamium* is noted. They occur more commonly in Roman *Verulamium* in the quarter century following the Claudian invasion (cf. *Verulamium*, fig. 34, 56-59).

Mortar.

4. Hard buff rim fragment with part of protruding spout. No grit visible. The ware resembles that of the mortaria from the 'Pit 6' pottery at Verulamium (*Ant. Journ.*, xxi, fig. 3, A-H, p. 278) and must be assigned to the second quarter of the second century.

Reeded carinated bowls.

5. Hard buff, burnt black and sooted on the rim and outside. Two deep incised grooves on the thick flat rim. This is a form of bowl that in most parts of the province would be assigned to the Flavian period, and it is not found after the first quarter of the second century.
6. Light pink fabric, broken off at the carination.
7. Coarse buff, burnt grey in patches. The wall is somewhat corrugated and the outline weak. This bowl is identical with the fabric and form of a common product of the 'Pit 6' pottery at Verulamium and was probably made there. (*Ant. Journ.*, xxi, fig. 1, type 1, p. 273-6.)
8. Hard buff, burnt grey inside. Another product of the same pottery (*ibid.*, fig. 2, F-K, p. 274).
9. Hard yellowish buff. Contemporary with nos. 7 and 8, Verulamium Ins. xvii (*Arch.*, xc, fig. 15, 10). Another, not illustrated, belongs to the same group.
For full discussion of the dating of these carinated bowls, see *Ant. Journ.*, xxi, pp. 274-6. Nos. 7-9 come late in the series and must be dated about the mid second century.

Cordoned jars.

10. Coarse silver-grey rather roughly made and distorted, as is so often the case with these hard-baked thin-walled jars. A cordon, demarcated by grooves marks the junction of the neck with the pronounced shoulder on which is scored a rather crude impressed lattice. The neck, bulge and lower part of the body are roughly smoothed, but there are two unsmoothed bands on the lower body.
11. Another similar in ware and size, but rather better made and having a finer, very faintly impressed lattice on the shoulder band. Several fragments of other vessels of this type are not illustrated. This type of jar has a Belgic prototype and its development to Antonine times is well represented at Verulamium (*Verulamium*, p. 196). These two examples with their marked shoulder and graceful outline may confidently be assigned to the late first century.
12. Hard light grey ware with faint vertical lines impressed on the shoulder band. This appears to be rather later in the series than nos. 10 and 11. In form it lies between *Verulamium*, fig. 35, 66, dated A.D. 110-140 and *Verulamium*, fig. 33, 50, late Antonine. Cf. also *Arch.*, xc, fig. 15, 4, Hadrian-Antonine. It may therefore be assigned to the second quarter of the second century.

Flagon.

13. Rim of a large two-handled flagon in hard pale buff, with the characteristic rim and hollowed mouth of the series from the 'Pit 6' pottery at Verulamium (*Ant. Journ.*, xxi, fig. 8, type 13b, and *Verulamium*, fig. 30, 29). A fragment of a large handle in whitish buff with a single broad medial groove from another vessel of the same type and source was also found (*loc. cit.*, type 13a). These are probably Hadrianic.
15. Handle of honey-pot in grey-buff ware.

Small jars and beakers.

14. Jar in hard coarse pinkish buff, burnt grey on the shoulder, with moulded undercut rim, no neck and marked shoulder.
16. Globular beaker in thin smooth grey with sharply everted rim and incised shoulder groove. The body shows traces of decoration of barbotined dots, but insufficient remains to show their disposition.
17. Sherd of soft cream ware from a similar beaker, bearing part of a ridged circle and rows of barbotined dots, in the same technique.

18. Sherd from the side of a similar beaker, decorated with 'raspberries' formed of fifteen to twenty barbotined spots of whitish-grey slip, some of which have rubbed off.
The last three belong to a well-known late first century type, formerly called 'Upchurch ware' (cf. *Ant. Journ.*, xx, 504, from the Verulamium Forum; *Richborough III*, 278, dated A.D. 70-100).

Lids.

20. Grey ware with reddish-brown surface layer, decorated on the outside by a series of incised concentric lines and oblique incisions. The ware is Belgic, and a date in the first half of the first century is probable.
21. Hard dense gritty black. For the form cf. *Arch.*, xc, fig. 14, 47, from phase 2 of Insula xvii at Verulamium, which is pre-A.D. 61.
22. Coarse grey ware. Not an easy form to date, but cf. *Arch.*, xc, fig. 14, no. 49, c. A.D. 50-60.

Bowls and dishes.

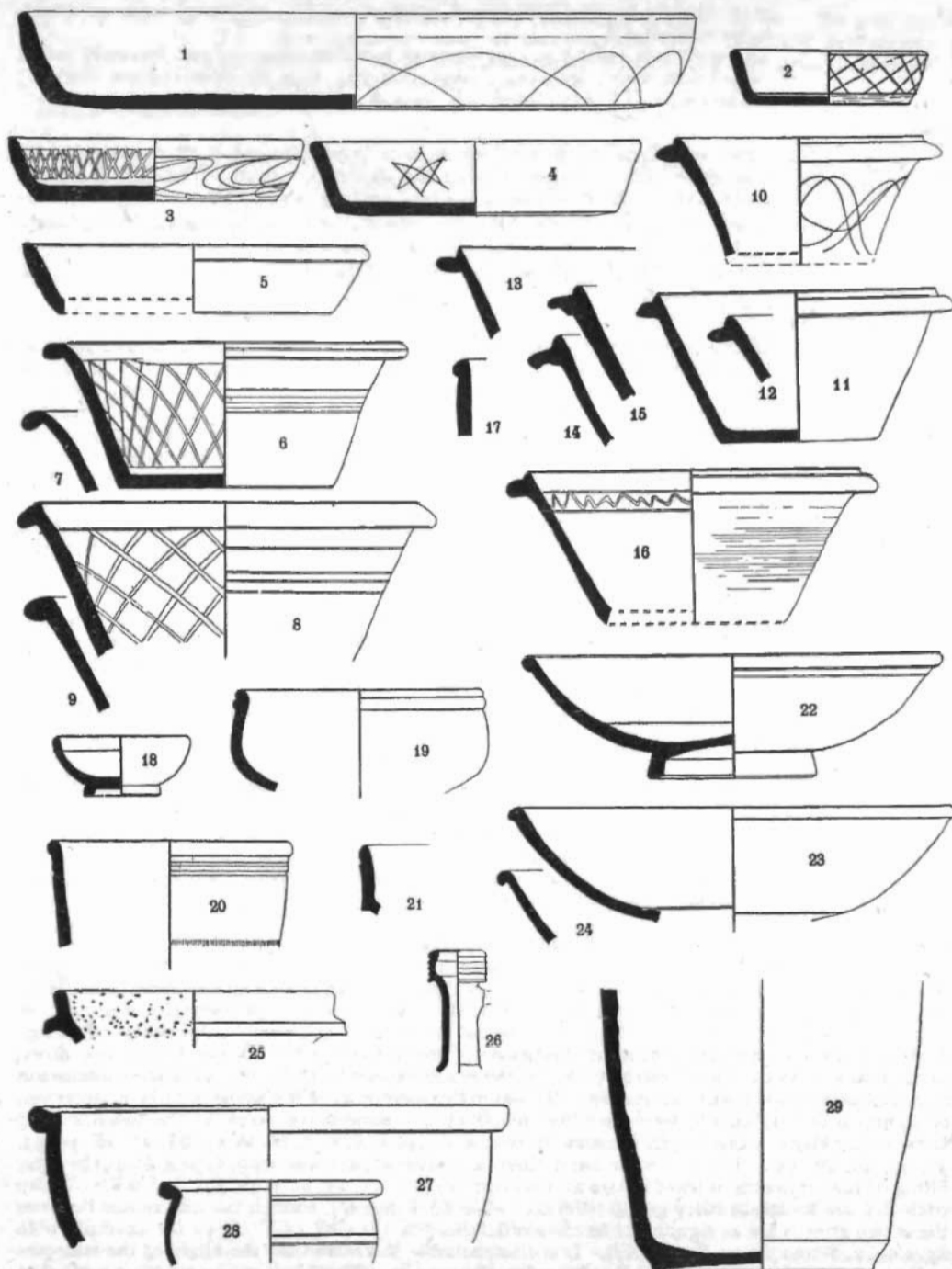
19. Rather soft light grey ware with plain lip above moulded collar and cylindrical body in imitation of Samian form 30. Clear traces remain of vertical and oblique lines of faintly impressed combing. This form of bowl occurs at Wroxeter in the late first century (*Wroxeter I*, fig. 17, 11), and a related bowl owing something to Samian form 29 appears there a little later (*ibid.*, fig. 17, 6, dated A.D. 80-110). A bowl of somewhat similar form was made in buff ware at the 'Pit 6' pottery at Verulamium c. A.D. 120-160 (*Ant. Journ.*, xxi, fig. 1, type 2a).
23. A Belgic dish in hard gritty buff, burnt black externally. Cf. *Verulamium*, fig. 12, 21, early first century, and less closely *Lockleys*, fig. 5, 7, Claudian.
24. Hemispherical bowl in hard unsmoothed pale buff. Beaded rim and two wide girth grooves.
25. Hemispherical bowl with plain lip and small rounded flange low down on the body, perhaps a lipless version of Samian form 44. The ware is dull orange-red, charged with mica particles. The surface is unsmoothed but has a gold glint due to the mica.
26. Rim of a platter in ware resembling that of no. 25, but with rather less mica in it.

Plain Samian.

27. Form 18 with pronounced lip and external ledge. This is closely paralleled by the early pre-Flavian series from Insula xvii at Verulamium (*Arch.*, xc, fig. 6, no. 3, etc.). Several other rims of the same form and date were also found. c. A.D. 50-60.
28. Form 36 in good ware and glaze. Early Flavian. Another thinner and shallower of like date was also found.

FIGS. 18 AND 19. POTTERY FROM THE STAIRCASE WELL.

This large group may confidently be assigned to the first half of the fourth century. Although the deposit was stratified (see fig. 5, section G-G.) fragments of the same vessel were frequently found in widely separated layers, and it became apparent that the whole filling had been inserted at one time, the stratification being caused by successive loads of filling. A silver coin of Constantine in good condition (p. 56) dated c. A.D. 320 was found low down in the filling. As the fourth century date of the group cannot be in doubt, exhaustive discussion of parallels has not been undertaken. The approximate date of the latest sherds is, however, of significance. It should be noted that many of the same types occur at the neighbouring farm at Lockleys in the fourth century up to c. A.D. 340 (e.g. 6, 7, 10-16, 23, 24, 27, 28, 34, 35, 37, 39, 40, 47, 53). On the other hand there are several parallels with vessels from the later filling of the orchestra of the Theatre at Verulamium (e.g. 21, 25, 31-3, 35, 53), and some overlap with the late fourth century group from the cellar floor (fig. 20), though the differences between these two groups are as significant as the similarities (cf. 3, 11-16, 31-3, 35, 49 for example with fig. 20, 4, 2, 8-10, 13, 14 respectively). It seems probable therefore that the filling of the staircase well was inserted about the middle of the fourth century. This large group together with that from the cellar floor, along with those from the Verulamium Theatre and the appropriate groups from Lockleys now provide us with a complete picture of the pottery in use during the fourth century in the Verulamium district.

FIG. 18. POTTERY FROM THE STAIRCASE WELL. $\frac{1}{4}$

Dishes.

1. Very large straight-sided dish in gritty grey ware, polished on the inside of the wall and base, and smoothed outside but for a band beneath the rim. Decoration of scribbled lines beneath the base and flat scribed arcs on the outside wall.
2. Gritty grey ware with roughly impressed lattice on the outside. Another, not illustrated, in browner ware has undecorated walls but scribbled lines beneath the base and zones of zig-zag and oblique lines, separated by broad bands, crossing the inside of the base.
3. Coarse gritty grey ware, polished on the rim and at the internal junction of the wall and the base. The lower part of the exterior wall is covered with a maze of scribbled lines, and the inside bears a crudely and rather heavily burnished lattice. Cf. fig. 20, nos. 1 and 4, and nos. 6 and 8 below, all of which are presumably products of some local pottery.
4. Gritty black ware with brownish-grey surface, smoothed outside and polished within. On the underside of the base is an owner's mark in the form of an incised six-pointed star (inset).
5. Gritty grey ware smoothed on the surface. Three cuts across the rim appear to be an owner's mark.

Bowls.

6. Pie-dish with roll-rim in hard grey ware, polished on the upper surface of the rim and for half an inch inside it. There are burnished bands around the outside. Decoration of crudely impressed lattice on the inside may indicate the same origin as no. 3 above.
7. A similar dish with even more protruding lip, in gritty red-brown ware with black surface, polished on the rim and over the whole of the inside. A single example of this type occurs in the second quarter of the fourth century at *Lockleys* (fig. 9, no. 13), and in a mid fourth-century pit (*ibid.*, fig. 13, no. 1). It is to be noted that no example was found on the cellar floor.
8. Pie-dish in heavy coarse light-grey ware with smoothed bands and internal lattice similar to no. 6.
9. Grey ware, smoothed inside and without decoration. Such dishes as nos. 8 and 9 are not normally found in the fourth century, by which time they had been superseded by the straight-sided flanged bowls like nos. 10-16. The heavy roll-rim is common throughout the third century (*Birdoswald*,¹ fig. 16, no. 80).
- 10-16. A selection of the common fourth century flanged bowls in a variety of grey and black ware of varying finish. Nos. 10 and 15 have intersecting burnished wavy lines on the outside, no. 14 intersecting arcs. No. 16, in light-grey ware of poor finish, has a reserved band high up on the inner wall bearing a faint scribbled line. Bowls with this decoration are very common on northern sites after A.D. 370 and were made at Crambeck in great quantities, where they comprised about half the output of the kilns (*Crambeck*,² p. 25; *Ant. Journ.*, xvii, fig. 2, 1b). But this vessel is coarser than most of the Crambeck bowls, and is hardly likely to have been made there. Its only recorded occurrence elsewhere is at *Lockleys*, fig. 9, where it is dated before A.D. 340. These two Hertfordshire bowls are the only two known to me which bear the internal wavy line decoration that were not certainly made at Crambeck. No. 13 is in sandy buff ware, purplish-grey outside.
17. A straight-sided dish in thick 'Castor' ware, with pinkish core and bronze slip glaze. The ware is to be compared with that of nos. 2 and 3 from the cellar floor (fig. 20). For a discussion of its date see p. 93.
27. Heavy bowl with hollowed knobbed flange in very hard coarse orange-red ware with drab core. Cf. *Lockleys*, fig. 9, 2.

¹ Richmond and Birley, Excavations on Hadrian's Wall in the Birdoswald-Pike Hill Sector, 1929. (*Trans. Cumberland and Westmorland A. & A. Soc.*, N.S. xxx, 1930.)

² Corder, *The Roman Pottery at Crambeck, Castle Howard*, 1928.

28. A smaller version of the same, but in hard light grey ware smoothed on the rim and shoulder above girth grooves. The form at Lockleys is dated before A.D. 340. Cf. No. 47 below.

Imitation Samian and Allied Wares.

- 18-26 are all in red or orange ware of some kind. They comprise different forms but have been grouped together because they are representative of a ware that occurs widely in mid fourth-century groups throughout Britain. Most of the forms represented owe much to Samian prototypes, and some, such as nos. 18, 21-23, are such close imitations of common Antonine Samian forms that they must be classed as copies. But the frequency with which good copies of Samian forms 31, 38, and 45 occur in mid fourth-century groups as widely separated as Lydney and Verulamium, Richborough and Segontium, definitely precludes their being contemporary with the Samian forms they imitate. Indeed fourth-century potteries, such as Crambeck, are known to have manufactured smooth bright red imitations of Samian form 38 (*Crambeck*, pl. 1, 18, 19), while the copies of this form in grey and black ware or in red painted ware are among the commonest bowls in use in the fourth century. This recurrence of good Samian imitations and copies more than a century after the cessation of manufacture of the originals presupposes survival of considerable numbers of the Antonine dishes.
18. Small cup in thick orange ware imitating Samian form 40 (*O. & P.*, XLVIII, 11-16).
19. Hemispherical bowl in hard brick-red ware with smooth slip-coated light-red surface. Cf. Ludowici Type Sr. The form is not uncommon in grey ware at this period.
20. Cylindrical bowl in brick-red ware, covered with bright red slip-glaze, now mostly worn off. A line of rouletting is distinguishable low down on the outer wall. This bowl is reminiscent of the late Samian variants of form 30 with rouletted decoration (*Guildhall Cat.*, XLV., 6, 8).
21. Fragment of a mortarium of form 45 in hard orange ware with grey core, and exterior coating of matt orange-red slip. Cf. Verulamium Theatre (*Arch.*, LXXXIV, fig. 11, 23).
22. Bowl of Samian form 31 in pale red ware with mica-dusted surface, giving an almost gilt finish.
23. Similar, but in red ware with grey core and smooth light red surface resembling East Gaulish ware. Cf. *Lockleys*, fig. 13, 4, mid fourth century.
24. Similar, but the hooked rim is further from the prototype.
25. Small flanged mortar in grey ware with thick light red layer outside covered with orange-red slip. Crystalline grit is sprinkled freely on the interior. This is a common fourth century type. It occurred in the brown earth filling of the orchestra at the Verulamium Theatre (*Arch.*, LXXXIV, fig. 11, 30), and one example came from the latest black deposit.
26. Neck of a single-handled flagon in smooth hard orange-red ware with tall cylindrical neck surmounted by a grooved moulded collar. A somewhat similar jug from Verulamium Ins. XII, found with a late third century coin, belongs to the beginning of the fourth century (*Ant. Journ.*, XVII, fig. 11, 20).
29. Lower part of a tall, almost cylindrical, vessel in very hard almost brick-like ware, grey at the core with flecks of black in it, but with an external layer of orange-red. It has a pronounced bevel at the base, and is internally corrugated owing to its depth. I have never seen a parallel and have no idea of the complete form of this extraordinary vessel. Its easily recognized fragments proved useful in relating the different layers down to the gravel at the very bottom of the filling throughout which it was scattered.

Jars and Cooking-pots.

30. Small jar in buff ware, burnt grey in places. Jars in this ware had a long life at Verulamium (see *Ant. Journ.*, XXI, 287). The proportions of this example suggest a date late in the third century.

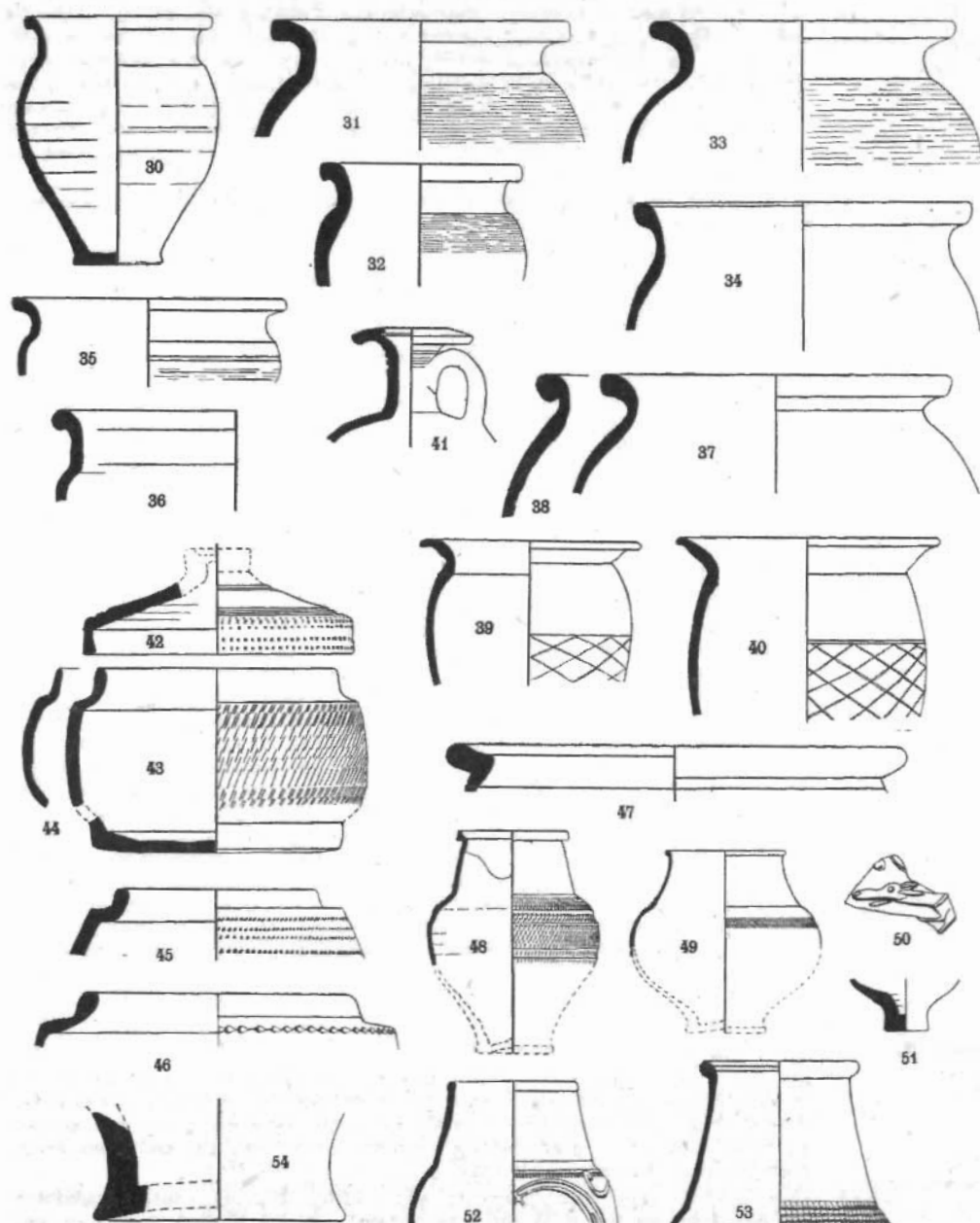


FIG. 19. POTTERY FROM THE STAIRCASE WELL. $\frac{1}{4}$

- 31-33 are cooking-pots in ware charged with calcitic grit, and with faint rilling or furrowing on the body. Pots of this form and ware are found in the filling of the orchestra of the Theatre at Verulamium (*Arch.*, LXXXIV, fig. 11, 21) and also at Lockleys after A.D. 340 (*Lockleys*, fig. 12, 1). Like its late fourth century northern contemporary, the Huntcliff type of cookpot, it shows the emergence of earlier native features in the calcite-gritted fabric, which is hardly to be distinguished from that in use on Belgic sites in the late first century B.C. or early in the first century A.D. The regular though rather faint, rilling of the surface must also be related to the furrowed or combed ware characteristic of Belgic and early Romano-British levels at Verulamium and elsewhere.
31. Coarse brown ware containing much powdered calcitic grit. Shoulder faintly rilled.
32. Grey ware with salmon pink surface, and faint rilling on the outside.
33. Light grey to buff with rough 'oatmeal' surface. Shallow tooled lines around the body.
34. Jar in hard sandy yellowish buff ware with pinkish core. Cf. *Lockleys*, fig. 10, 20, 21, first half of fourth century.
35. Wide-mouthed jar or bowl with tooled lines around the body. Cf. *Lockleys*, fig. 9, 3, from the same group as the above. The same form appears in hard orange-red ware in the filling of the orchestra of the Verulamium Theatre (*Arch.*, LXXXIV, fig. 11, 17).
36. A larger bowl of the same type, but in hard light grey ware.
37. Large jar in hard gritty light grey ware with granulated surface, the paste having an intermixture of crystalline sandy particles. Cf. *Lockleys*, fig. 10, 14-20.
38. Another similar, but with heavier and more rounded rim.
- 39, 40. Cooking-pots of a well-known fourth century type characterized by their gritty black ware with highly polished surface, save for the unpolished zone around the body bearing an oblique lattice. In the north this common type was superseded by the Huntcliff type about the middle of the century (*Birdoswald*, p. 191), but at *Lydney* (fig. 26, 32-35, fig. 27, 37-39) one (no. 35) came from the final floor of the cella of the Temple inserted after A.D. 367. At Verulamium the type occurs rather infrequently and by the time the orchestra of the Theatre received its filling it had been superseded by the jar of calcite-gritted ware, like 31-33 above or fig. 20, nos. 8-10 from the cellar floor. It is found before the middle of the century at *Lockleys* (fig. 20, 10, 23) and was common in the mid fourth-century stratum of the fort at *Segontium* (fig. 78, 55-57). It is not common at Park Street, but the finding of these two examples in this group is a useful check on the date of the local wares. If the extent to which the rim oversails the maximum girth is a criterion of date, no. 39 should be placed in the early fourth century, and no. 40 between A.D. 350 and 370, after which it is only found as a survival.

Jug.

41. Neck of a small single-handled jug in pink ware with red-brown slip-coating, mostly perished.

Lidded Boxes in Castor and Allied Wares.

- 42-46 are parts of squat circular boxes usually decorated by rouletting on the bulging bodies, and having a plain lipless rim for the reception of a circular rouletted lid. These are known products of the Castor kilns, and nos. 42 and 43, which almost certainly belong together, have been restored from *Artis, Durobrivae of Antoninus*, pl. XLIX, 4.
- 42-43. Pale biscuit ware with chocolate slip-coating, bearing coarse rouletting machined before the final slip was applied. A lid similar to no. 42 was found at Verulamium Ins. XII with a late third century coin (*Ant. Journ.*, xvii, fig. 9, 10 and p. 48) in association with a barbotined beaker like no. 52 below.
44. Part of a similar box in orange buff ware with bronze slip-coating, and finer rouletting covering the upper $1\frac{3}{4}$ inches only of the body.

45. Upper part of a similar box in rather different ware. The paste is very hard and dense, yellowish and of almost brick-like consistency, with a thin matt brown slip-coating on the outside only. Regular lines of roulette nickings around the body.
46. Box of the same form, but in quite different technique. The ware is very hard coarse yellowish-grey, unsmoothed and without any slip-coating. In place of the usual rouletting there is a line of deep notchings around the shoulder. I know of no parallel.

Colour-coated beakers.

48. Rouletted pentice-moulded beaker in hard thin, dense orange-buff ware, coated externally with red-brown slip glaze, which has run down the inside of the neck.
49. Small globular beaker of Rhenish ware, reconstructed from numerous fragments. Very thin light-red ware with metallic lustrous bronze slip-glaze. A double band of rouletting runs round the shoulder, and there are traces of other bands around the body.
50. One of a number of sherds from different Castor beakers decorated with running animals applied en barbotine. These so-called hunt cups appear first at Verulamium after the Antonine period (*Verulamium*, p. 182) and are not common until the third century when the supply of imported Samian became much reduced.
51. Base of a small beaker in orange ware with smooth red slip coating.
52. Colour-coated beaker in pale yellow ware with dark bronze slip-coating. There is a line of rouletting just below the shoulder and at least one other similar band lower down the body, which is decorated with scrolls and tendrils in white slip en barbotine. Several other fragments of similar beakers were in this group. See no. 42 above.
53. Part of the neck of a large pentice-moulded beaker, with dark chocolate slip-glaze inside and out. The pronounced lip of this and no. 48 may be a late feature. Cf. Verulamium Theatre (*Arch.*, LXXXIV, fig. 11, 22). The pentice-moulded beaker is typical of fourth century deposits at *Lockleys* (fig. 12, 6 and p. 373).

Miscellaneous.

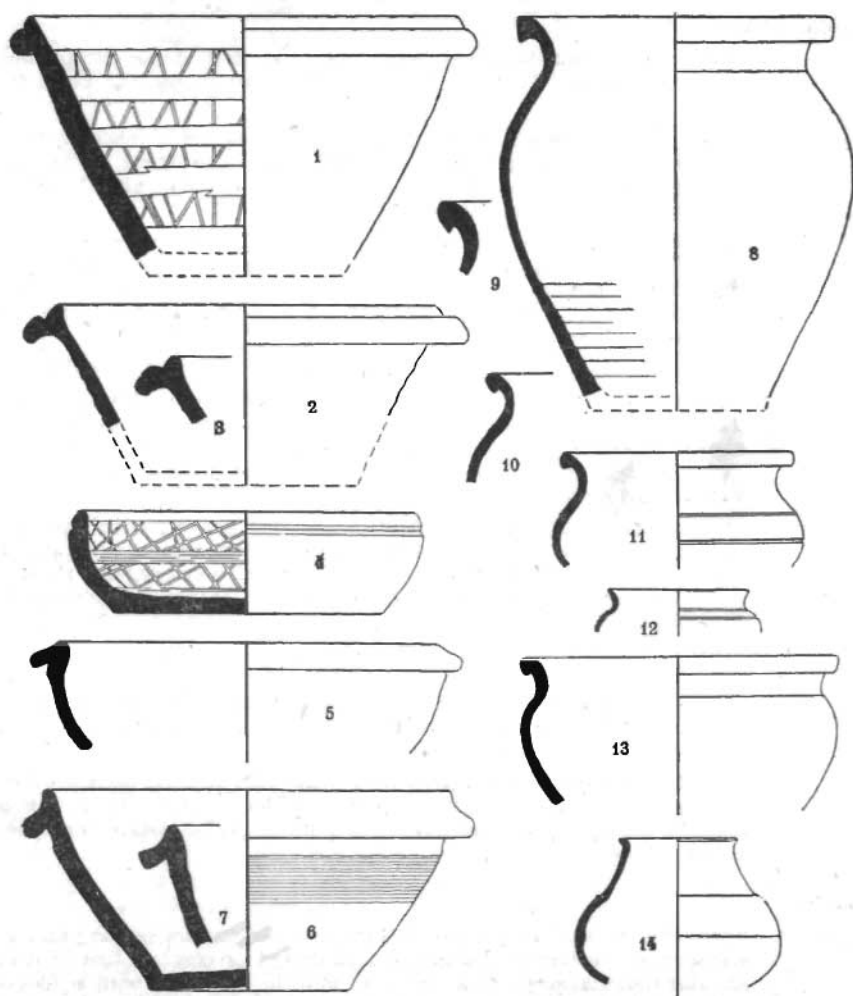
47. Heavy rim of a large orange to grey bowl of the same general type as nos. 27 and 28. It has a hard gritty surface and presumably a rounded wall, as *Lockleys*, fig. 9, 2, dated before A.D. 340.
54. Very heavy base in stony grey-buff ware with smooth light grey exterior. Its concave outline distantly suggests a pedestal base. If so, this may be another example of the emergence of a much earlier native tradition in the fourth century.

Stamped Ware.

- Fig. 22, no. 3. Sherd of very hard grey ware with unsmoothed surface bearing an impressed stamped decoration consisting of a rouletted or combed line of deep rectangular indentations and a circle, 19 mm. in diameter, with scalloped edge and containing a cross and pellets. This stamp has caused distortion of the vessel, the circle having caused a bulge on the inner side. The closest parallel comes from Silchester (*Silchester*, LXXXIIB) where the circle is smaller and plain. Circles containing cross and pellet decoration were found on a bowl in smooth grey ware in Period III (c. A.D. 370) at Bourton on the Water (*Trans. Bristol and Glos. A. S.*, vol. 56 (1934), fig. 6. The Silchester sherd is illustrated in fig. 7). Mr. G. C. Dunning, in a full discussion of the Bourton sherd, quotes Merovingian parallels and concludes that, 'stamped pattern falls into place amongst the Teutonic elements which appear in Romano-British culture in the fourth century'. The Park Street sherd came from the lowest level in the filling, but must nevertheless be one of the latest sherds in the group.

FIG. 20. POTTERY FROM THE BURNT LAYER ON THE CELLAR FLOOR.

This group of pottery was found in the black layer of burnt material, including a certain amount of burnt wheat, that lay on the cellar floor. The bulk of it was evidently in use in the period just preceding the destruction of the house, and its date should indicate the end of the occupation. With the exception of no. 12 all the vessels belong to the second half of the fourth century. Nos. 2, 3, 5, 6, 7, and 10 can all be paralleled from the latest filling of the orchestra at the Theatre at Verulamium, which has tentatively been dated after A.D. 379 (*Arch.*, LXXXIV,

FIG. 20. POTTERY FROM THE BURNT LAYER ON THE CELLAR FLOOR. $\frac{1}{4}$

241). The destruction of the farm at Lockleys, Welwyn, has been assigned to the last quarter of the fourth century (*Ant. Journ.*, xviii, 350-1). Although the evidence cannot yet be considered conclusive, it is usual to assign the destruction of such outlying farms as Lockleys and Park Street to the period of the Pictish War. All that can be said of this group is that it is a representative sample of the latest Roman wares that can be recognized in the Verulamium district.

Several characteristics are worthy of note :

- (1) The reappearance of rilling or combing on the bodies of bowls and jars (nos. 5, 6, 8).

(2) The use of good, but rather thick, slip-coated (Castor ?) ware for bowls and dishes (nos. 2, 3).

(3) Smooth light red or orange ware that sometimes attains to a good imitation of Samian (no. 13).

(4) As in the north, calcite-gritted ware is used for bowls and cooking-pots (nos. 5, 6, 7, 8), though the Huntcliff type is never encountered, its place being taken by unsmoothed shoulderless pots like no. 8.

- Fig. 20, no. 1. Heavy straight-sided bowl with rounded flange below the lip. Hard grey ware, burnt light red in places, smoothed outside and polished on the rim. Decorated inside with irregular scored lattice pattern crossed by five horizontal polished bands. I have not encountered such decoration *inside* bowls or dishes except at Park Street. Scored arcs or lattice may be supposed to be derived from basket-work and to be functional as they assist grip, but such decoration inside vessels is meaningless. As it is found elsewhere at Park Street (as in no. 4 below) it may be regarded as the product of some local pottery.
- 2, 3. Well-made straight-sided flanged bowls in yellowish white ware with matt chocolate to dark bronze glaze. In no. 3 the paste has burnt grey in places. Although the origin of this ware is not known it may tentatively be considered as a late product of the Castor kilns. It is in widespread use in the late fourth century. In the north it occurs after A.D. 370 in the coastal Signal Stations (*J.R.S.*, ii, 227; *Arch. J.*, LXXXIX, 223, fig. 1, nos. 1, 3) and at other late fourth century sites (*Y.A.J.*, xxxii, 336, fig. 2, nos. 3 and 4; *Proc. York Arch. Soc.*, i, fig. 7, nos. 20, 21). It is also found at Margidunum in the late fourth century (*J.R.S.*, xxxi, fig. 15, nos. 23, p. 59). At Verulamium it is common in the rubbish filling the orchestra after the disuse of the Theatre, where only one example was found in Period IV (third century) (*Arch.*, LXXXIV, fig. 10, no. 16).
4. Grey dish with curved sides and flat base. Uncoated and unpolished outside, but the rim and interior are covered with a dark slip. The inside bears an irregular scored lattice pattern crossed by three horizontal burnished bands, and the base has been similarly treated with scored straight lines arranged like spokes of a wheel crossed by concentric burnished bands. Evidently from the same source as no. 1 above. Cf. *Lockleys*, fig. 9, no. 5, with scribbled pattern inside, dated A.D. 325-30.
5. Bowl of grey ware with dull orange-drab surface. The ware is charged with flecks of white calcitic grit, and the surface is hard and 'porridgy' and covered with fine horizontal ridges externally (*Lydney*, fig. 26, 23).
6. A larger bowl in the same ware, but with browner surface, and somewhat pitted owing to the dissolving of the calcitic grit. The horizontal rilling of the outer wall is even more marked than in no. 5. For both nos. 5 and 6 cf. Verulamium Theatre (*Arch.*, LXXXIV, fig. 11, nos. 26 and 27) which occurred only in the latest level of rubbish filling the orchestra, with more than 1,300 coins, twenty-one of which were of the house of Theodosius.
7. Rim of a bowl in the same ware. Diameter 10½ inches.
8. Cooking-pot in hard grey calcite-gritted ware with undercut rim and regular fine horizontal lines around the body (cf. nos. 5 and 6). This type of pot occurred in the latest levels filling the orchestra of the Verulamium Theatre (loc. cit., fig. 11, no. 21) and in the burnt material from rooms 4 and 5 at Lockleys, Welwyn (loc. cit., fig. 12, no. 1) dated after A.D. 340. At Segontium it was found with a coin of Constantine I (A.D. 313-317) and is characteristic of the late fourth century strata in the fort (*Segontium*, fig. 78, no. 58). It appears at Lydney in the same period (*Lydney*, fig. 27, no. 57). It is in fact the southern equivalent of the Huntcliff type of cook-pot, and is securely dated to the second half of the century.
- 9, 10. Rims of other jars in the same ware.
11. Small bowl in hard pink ware with smooth brown surface.
12. Small orange beaker with smooth mica-coating, largely perished. This would appear to be a survival from a much earlier period.

13. Bowl of light red ware, highly polished outside. A similar bowl in the same bright red ware occurs in both the brown and black earth layers of the Verulamium Theatre (*Arch.*, LXXXIV, fig. 11, no. 17). This type of ware, particularly in imitations of Samian forms 31, 38 and 45, is of wide distribution in the late fourth century (*Segontium*, fig. 78, no. 57, and *Lydney*, fig. 27, nos. 48-51, in both cases associated with black cooking-pots similar to fig. 19, no. 40; *Richborough* I, 104 and II, 183).
14. Small beaker in very hard brittle light grey ware, burnished on the rim, neck and upper part of the body. Found in the filling of the post-hole on the south side of the cellar floor. In form this resembles the black slip-coated Rhenish beakers imported in the third and fourth centuries, and also in the almost metallic brittleness of its ware, though it lacks their glazed finish. (*Lydney*, fig. 27, nos. 60 and 61.)

FIG. 21. POTTERY FROM THE FURNACE IN ROOM XI.

The sherds in this group were found in the burnt layer in the stoking pit, or from the clay side of it (no. 5). As several of them can be paralleled from the cellar floor at Park Street (fig. 20), or from the filling of the orchestra of the Theatre at Verulamium, there can be no doubt that the furnace was in operation until the end of the occupation. The latest sherds (e.g. nos. 2, 6, 7, 8, 10) are not earlier than the third quarter of the fourth century.

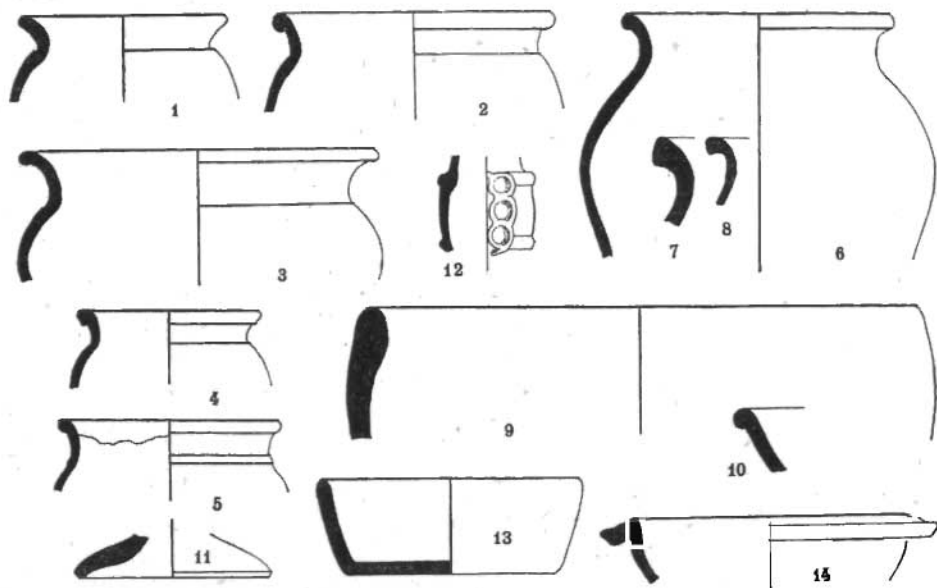


FIG. 21. POTTERY FROM THE FURNACE IN ROOM XI. $\frac{1}{4}$

- Fig. 21, no. 1. Cook-pot in coarse brown ware with smoothed black exterior surface, now largely perished. Probably there was a band of oblique lattice around the body. Jars of this form had a very long life, and merged into the characteristic fourth century type in which the maximum diameter is at the rim. A late third century date seems probable for this jar (cf. *Birdoswald*, fig. 14, 18m, o), though a jar of similar profile came from a fourth century group at *Lockleys* (fig. 10, no. 23).
2. Jar in orange-red ware, formerly covered outside with a smooth bright red slip, now almost entirely flaked off. Cf. fig. 20, no. 13, from the cellar floor, where its late fourth century date is discussed.
 3. Wide-mouthed jar in soft pale buff ware. This is broadly similar to the round-bodied bowls from *Lockleys* (fig. 9, no. 6) of the first half of the fourth century, in which the maximum diameter of the body does not exceed that of the rim.

4. Small jar in very hard brick-red ware, smoothed on the rim and outside. Cf. *Lockleys*, fig. 12, no. 7, mid fourth century. This red ware is characteristic of the second half of the fourth century (p. 88).
5. Jar in grey ware coated on the rim and outside with a white slip. This grey ware with white slip coating was made at the kilns near Farnham in the second half of the third century. (*Ant. Journ.*, viii, fig. 2, d.)
6. Reconstructed drawing of a cook-pot in gritty brown to black ware, heavily charged with calcitic grit. The body, which is thin and hard, is covered with fine wheel-made striations, about twenty to the inch. Cf. fig. 20, no. 8, where the type is discussed.
7. Rim of larger pot in similar, but coarser, ware, buff to brown in colour.
8. Similar to nos. 6 and 7, but with the hooked rim so common in deposits of the second half of the fourth century in this district. Cf. fig. 20, no. 9, from the cellar floor.
9. Very large bowl or dish in hard red ware, with roughly smoothed brownish surface.
10. Rim of bowl imitating Samian form 31 in hard bright red ware, covered with red slip and polished. This imitation Samian, especially of forms 31, 38 and 45, is common in the fourth century (p. 88).
11. Small lid in red-brown ware, originally covered outside with dark red slip.
12. Fragment of the neck of a mask-mouthed flagon in bright red ware. On the moulded collar of the neck has been a human face in applied clay (now lost), surrounded by a series of circular depressions made with the finger-tip, three of which only survive in this fragment. These were intended to represent the head-dress of the female face that they surrounded. The form is illustrated by a flagon from the Roach Smith Collection from Mansell Street, London (Walters, *B.M. Cat.*, M.2757, fig. 282). Faint vertical lines of red paint or slip are traceable between the cordons demarcating the collar.
13. Straight-sided dish in dark red ware with polished surface inside and out, and gritty paste. Featureless dishes of this form abound in the fourth century, but do not admit of close dating.
14. Flanged bowl in hard coarse pale buff ware. A devolved form of the bowls made at Verulamium in the second century (*Ant. Journ.*, xxi, type 1, fig. 2, p., etc.). The profile approximates to that of fig. 20, no. 5, from the cellar floor, though the ware is different.

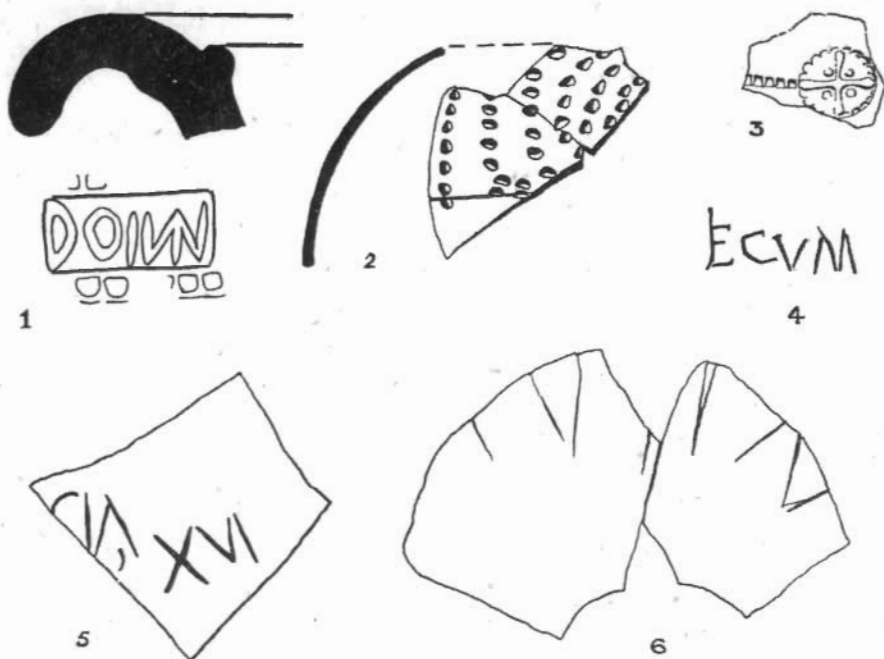
FIG. 22. POTTER'S STAMP, GRAFFITI, ETC.

Fig. 22, no. 1. Mortarium in buff ware stamped DOINV across the rim, found in the south-west corner of corridor near North wall of Room xi, with graffito no. 6, Samian form 18 and other wares of the late first and very early second century.

The identical stamp occurs at the Roman Theatre, Verulamium (unpublished) in a deposit of the early third century, which contained earlier material. A different stamp of DOINVS also with ligatured NV was found in a second century deposit in Insula XVII at Verulamium (*Arch.*, xc, fig. 15, no. 22 and p. 124), which contained nothing later than c. A.D. 160. At Wroxeter the stamp occurs on type 38 dated A.D. 80-110 (*Wrox.*, III fig. 3, no. 49 and p. 60), and in the excavations of 1936-7 is still another stamp DOINVS (*Arch.*, lxxxviii, fig. 14), assigned by Lt.-Col. E. B. Birley, F.S.A., to Vespasian-Trajan. Stamps of DOINVS are also reported from Corbridge (unpublished), Chester (*Journ. Chester Arch. Soc.*, xxvi, 1925), Easton Grey, Wilts (*J.R.S.*, xxiii, 205), Bedford, London Road (Bedford Modern School Museum), London (*C.I.L.*, vii, 1334, 74, and *B.M. Cat.*, 2829, 2830) and Colchester (*Mus. Cat.*,¹ fig. 7, no. 8). Late first or very early second century.

¹ May, *Catalogue of the Roman Pottery in the Colchester and Essex Museum*, 1930.

2. Two sherds from the body of a globular pot or beaker in thin smooth pipe-clay decorated with a series of deep indentations stabbed on the surface with the end of a small bone (?). Owing to the thinness of the ware these have raised circular blobs on the inner side of the vessel very similar in appearance to barbotined dots. Found between the corridor wall and the West wall of Room XI. The ware is first century: the style of decoration is related to that of the plump globular beakers so common at Colchester in Period IV onwards, c. A.D. 49-65 (*Cam.* type 108). I have not met with any exact parallel to the decoration.
3. Stamped ware from the staircase well (see p. 91).

FIG. 22. MISCELLANEOUS SHERDS. $\frac{1}{2}$

4. Graffito cut on a brick, 11/16 in. thick, after firing. Found on the dump near the late rubbish pit destroyed by the mechanical grab. The reading is *ECVM* in well-cut letters. There is no letter before the E, and the word may well be complete. I am indebted to Mr. R. P. Wright, F.S.A., to whom it was submitted, for permission to use his note, which appeared in *J.R.S.*, xxxv, p. 92. He suggests *ecum* for *equum*, or possibly the beginning of a name *Ecum*[. . . For this variant of *equus* (horse), cf. Dessau *ILS* 2487; *CIL*, viii, 2532, suppl. 18042.
5. Part of graffito */CIA*
XVI on the side of a dark grey jar found in the filling of the staircase well (fig. 22, no. 5) and therefore probably of fourth century date. (*J.R.S.*, xxxiv, p. 90, 18.)
6. Illegible graffito on two sherds of yellowish buff ware from the deposit containing the *DOINVS* stamp (no. 1 *supra*).

RELIEF-PATTERNED FLUE-TILES, BRICKS, ORNAMENTED IMBEX, MOULDED PLASTER, MARBLE, QUERNS, CLAY HEARTH, ETC.

RELIEF-PATTERNED FLUE-TILES. By A. W. G. LOWTHER, F.S.A.

Four of the five pieces of flue-tile bearing impressed patterns which were submitted to me for examination all bear the same pattern and come from the same, or similar, tiles.

The design (fig. 23, no. 4b) belongs to a definite group of which five variations can at present be located and which I have termed the *W Chevron Group* from a predominant motif in the design. This particular design is from Die No. 2 of the series¹ and has already been found at three other sites. 1. *Verulamium*: several pieces, all from undated levels (1935); 2. *Boxmoor Villa*, near Hemel Hempstead, Herts. (excavated by Sir John Evans in 1851): two pieces in the British Museum; 3. *Sutton Courtenay*, Berks: one piece found (1921) in a Saxon hut (House IV. *Arch.* XXIII, p. 179, Pl. XXVI, fig. 2 of Report by E. T. Leeds).

Several members of the *W Chevron Group* have been found *in situ* in work that can be dated to the latter half of the first century A.D., and, in view of their similarity, it is reasonable to suppose that the whole group is of this date. Since I am informed that the Park Street tiles are from a level dated *circa* A.D. 300, it seems that they had been removed from earlier structures (probably in *Verulamium*) and re-used in this later work, a thing that seems to have been done fairly frequently (e.g. Wiggonholt, Sussex; Highdown, Sussex; and 'Chatley Farm', Cobham, Surrey, at all of which first century flue-tiles were found re-used in third and fourth century buildings).

The Park Street tiles (as those from *Verulamium*; the Sutton Courtenay piece has not been examined by the writer) are of a peculiar mottled red and buff clay of different type from that of all other tiles inspected, and are slightly thicker than the average (17 mm. as against 14 mm.).

The cylindrical die used was three and three-eighths inches long and six and one-eighth inches in circumference, and the impressions show no sign of wood grain (as do many of these tiles) and it is likely that the design was embossed on thin sheet bronze which was then fixed to the surface of a wooden roller. (This suggestion is supported by tiles from Die No. 1, which have a thin ridge crossing the design, and evidently caused by a small gap having existed at the point where the two ends of the metal met when wrapped round the wooden core.)

In discussing the Sutton Courtenay specimen, Mr. Leeds suggested that part of the design (evidently the part where the lines are thinnest) had been separately engraved on the tiles. This clearly was not the case, as the design is identical on all pieces examined, including minute irregularities in the pattern.

As with all the other tiles of this group, the design had to be rolled out twice in order to cover the full width of the face of the flue-tile.

With the pieces of the tile impressed with the design No. 2, was found one small fragment with a diamond pattern (fig. 23, no. 4a, Die No. 16). Tiles which have been impressed with the same, or similar, dies have been found at four sites, namely Canterbury (1946 excavations), Wall, Staffs (1912), Alford, Sussex (1936), and at Cobham, Surrey ('Chatley Farm', a Roman bath-building of *circa* A.D. 300, initial date; excavated in 1943 by S. S. Frere, F.S.A., whose report is to appear shortly. The patterned tiles at this site appear to have been taken from earlier structures, as several of the eight different patterns found can be dated to the Flavian period).²

The tile is of red coloured brick, 15 mm. thick, and the impression shows the wood grain of the die, showing the design to have been cut directly on to a wooden cylinder.

Finally, as regards the purpose of these impressed designs, there is not the slightest doubt that it was to form a key for the mortar, and there is no foundation for the opinion that these tiles served any decorative purpose. Examples of tiles with the most elaborate

¹ The writer is preparing a paper incorporating all Roman patterned tiles, and will be glad to learn of unrecorded specimens.

² The Wall and Canterbury tiles are the only ones for which it is certain that the same die was used.

patterns have been found by the writer used in the normal manner and plastered over. As with the great variety of combed patterns which are found on flue-tiles, the purpose can only have been that of distinguishing the tiles made by an individual workman (several of the designs incorporate initials in the design, while the Plaxtol Villa, Kent, tiles bear the

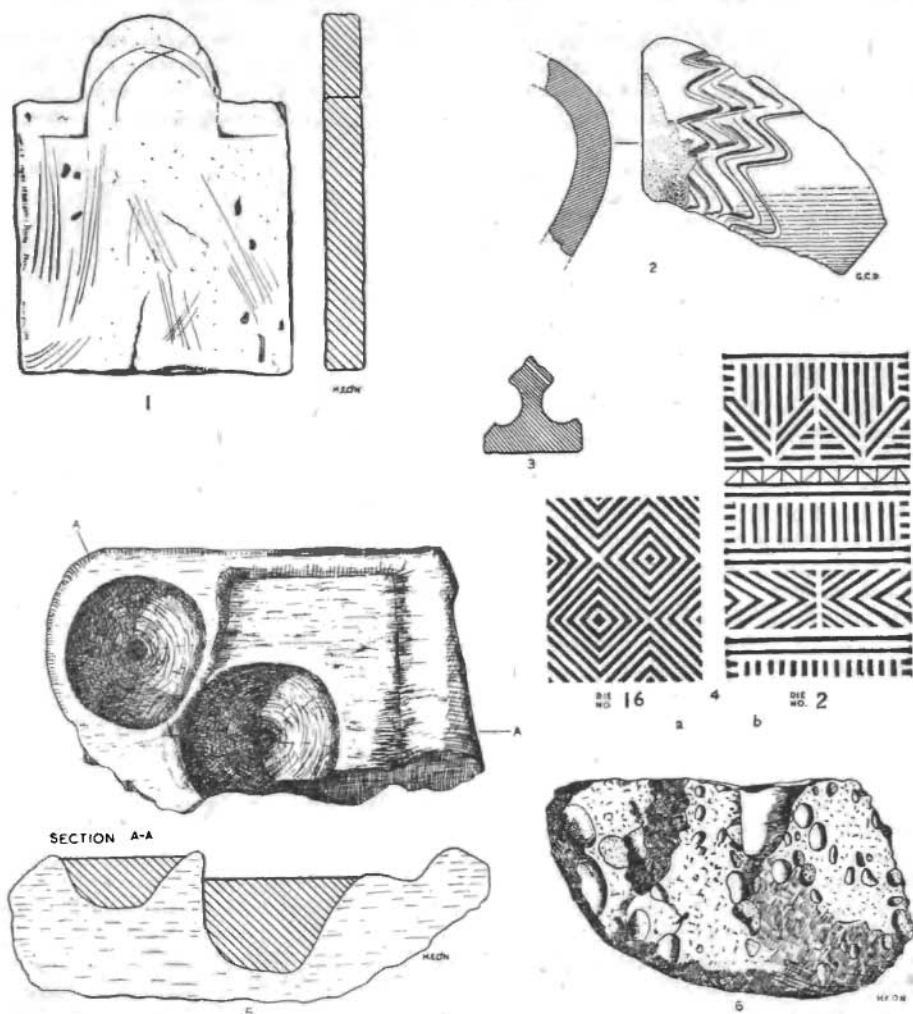


FIG. 23. MISCELLANEOUS OBJECTS

1. BRICK WITH SEMI-CIRCULAR EXTENSION. $\frac{1}{8}$
2. DECORATED IMBEX. $\frac{1}{4}$
3. SECTION OF MOULDED PLASTER. $\frac{1}{4}$
4. RELIEF PATTERNED FLUE TILES. $\frac{1}{4}$
5. CLAY HEARTH. $\frac{1}{8}$
6. LOWER STONE OF ROTARY QUERN OF HERTFORDSHIRE PUDDING STONE. $\frac{1}{4}$

full name of the maker) and was probably influenced by their being paid according to the number of tiles which each man produced.

(In fig. 23, no. 4, the recessed part of each design is shown in black.)

- Fig. 23, no. 1. Roman brick, with semi-circular extension on one side. One complete specimen and two fragments were found. The complete example (illustrated) measured eleven and a quarter inches square with an additional three and a half inches for the extension on one side, and was one and five-eighths inches thick. It was found in debris just outside the north wall of Room xv, a deposit for levelling the ground during the rebuilding of c. A.D. 300. The purpose for which these bricks were used at the villa is not known, but they could have been used either for decorative purposes such as engaged half columns or as floor supports of a hypocaust. Similar bricks were found at Verulamium.¹ Another type of segmented brick for use in columns was found at the Ashted Roman Villa² as well as at Verulamium.³ The Park Street bricks are of the usual colour and consistency of Roman brick. One side of the specimen illustrated had been left rough and the other had been smoothed by hand. Marks on this side show that other bricks had rested on it while being shaped into the half column form.
2. Imbrex with ornamental pattern. Fragment with wavy scored pattern at one end; found in surface building debris. It is unusual to find ornament on this type of tile, but the pattern was probably a key for mortar. Of hard texture and light red in colour.
 3. Plaster. Fragment of moulded plaster. White in colour; found in surface debris in corridor.
 5. Clay Hearth. Found outside the eastern entrance of the cellar. Moulded in a layer of yellow clay which had been deposited on the natural gravel. It consisted of a small platform fourteen inches across, of two levels, with a raised rim of varying height at the back and the right hand side. Two cup-like depressions, one in each level, were sunk into the platform. Each depression was filled with charcoal and ashes; an analysis of the former proved it to be of hazel (p. 102).
 6. Rotary Quern of Hertfordshire pudding stone. Portion of lower stone only, with flat top worn smooth with use and hole for the spindle. Found in the dark filling of Belgic Pit II (time of the Roman Conquest).

Not illustrated.

Belgic bricks, fragments of thin bricks, with the appearance of having been smoothed by hand, were found on Chalk Floor I and amongst the daub on Clay Floor B. Some of the fragments had rounded corners but no complete specimen was found to indicate the size.

Purbeck or Sussex marble. Five fragments of Paludina Limestone were found. They were all parts of polished slabs of about half an inch in thickness. They were evidently for some decorative purpose. One piece was found in Rubbish Pit IV, another in the building debris of Room XIII, two pieces in the filling of the staircase well and one from a rubbish pit of late date, which was destroyed by the grab.

Millstone Grit. Three fragments were found, two of which had been re-used in walls of the rebuilding of c. A.D. 300. All three fragments betrayed former use as querns. The grit is from the north of England (cf. the Derbyshire 'Peak Stone' used by modern millers).

Niedermendig Lava. Fragments found in the filling of the staircase well, showed some evidence of use as a quern.

Slag from burnt debris of south-west arm of hypocaust in Room v. An artificial metallurgical product. Dr. M. H. Hey identified it as litharge coated with hydrocerussite. Litharge is a product of the extraction of silver from argentiferous lead ores by cupellation; it is also prepared by heating lead in air at a high temperature, and used at the present day in making flintglass, in glazing pottery and in making paints.

Shells. In addition to large quantities of oyster shells, mussel, whelk and cockle shells were also found in Roman levels and it is of interest to note the use of a very small type of oyster from the shells found in Belgic debris, especially from Belgic Pit II.

¹ Information from Mr. Corder. Not mentioned or illustrated in Verulamium Report.

² *Survey Arch. Collections*, xxxviii, pl. iii and p. 6.

³ *Ant. Journal*, xvii, pl. xxiii, 2.

REPORT ON ANIMAL REMAINS

By J. WILFRID JACKSON, D.Sc., F.S.A., F.G.S.

The animal remains from the above site have been submitted to me by Mrs. Helen O'Neil for examination and report. As in similar sites the remains are in a fragmentary condition and except in a few cases do not lend themselves to measurement. They represent the food débris of the inhabitants. The remains are listed below under their locations.

1. Belgic Pit II, from top layer.
Ox. Imperfect shank bone and two phalanges.
Pig. Fragment of jaw and three loose teeth. From dark clay layer.
Pig. Fragments of mandibles and canine.
Horse. Incisor.
Sheep. Imperfect tibia.
Ox. Distal end of tibia. From dirty gravel level.
Pig. Fragment of mandible with last molar. From silt level.
Pig. Few limb bones, fragments of mandibles (young), fragment of skull.
Sheep. Fragment of mandible with two teeth; stump of horn-core.
2. Rubbish Pit III, from black layer.
Sheep. Horn-core.
Pig. Tooth.
3. Corridor, from filling at south end.
Fallow Deer. Base of shed antler with brow (= first) tine.
4. Room v, in trench for rebuilding south wall of cellar at three feet depth.
Fox. Skull in four fragments.
Mole. Mandible and various limb bones.
5. Room XI, from filling for building north wall and below the additional north wall.
? Human. Three humeri of very young children.
6. Staircase well. From filling in.
Ox. Fragmentary right mandible with four teeth.
 Imperfect left mandible with two teeth.
 Long rib trimmed along both sides.
Sheep. Imperfect left mandible with teeth (young).
Red Deer. Shank bone minus proximal end.
7. East entrance of cellar, from débris below beam-slot outside entrance.
Ox. Ulna showing cut-marks at top.
8. Cellar, from filling of building débris.
Red Deer. Large antler in several pieces.
Badger. Pair of mandibles and fragment of maxilla with teeth.
 From burnt débris on floor.
Pig. Incisor.
*Toad.*¹ Two limb bones.
 From débris on floor of cellar but heaped in a group at West end.
Ox. Left mandible with three molars, M₁.2.3. The length from the condyle to tip = 380 mm., length of full tooth-row = 129.5, length of the three molars = 82, depth behind M₃ = 72, least depth behind incisors = 29.
 Left mandible (broken) with full dentition, except incisors. The length from condyle to tip = 375 mm., length of full tooth-row = 132, length of the three molars = 82, depth behind M₃ = 69.5, least depth behind incisors = 29.
 Right mandible (fellow to the above).
 In addition to the above there are the following: Fragment of left mandible of young animal with milk-molars: fragment of maxilla with two molars (well worn); seven loose incisors and one loose molar; two horn-cores, (a) large example of the left side with a full length along outer curve of

¹ During excavation several live toads were found amongst the fallen building débris, even to a depth of seven feet in the Staircase Well, the latter evidently providing good winter

quarters for this genus. Live toads were also found in the red daub on Clay Floor B in Room v; these had assumed a dull red colour (H. E. O'Neil).

c. 200 mm., diameters at base = 69.5×53.5 ; (b) medium example of left side with a full length along outer curve of 132 mm., diameters at base = 48×38.5 . The circumference at base of (a) = 197 mm., and (b) = 132 mm.

Pig. Fragments of mandibles with young and old teeth, also loose teeth and one foot bone.

Sheep. Imperfect humerus.

9. Rooms xiv and xv, from débris in stoking pit of hypocaust.

Fox. Right mandible with full dentition.

Right mandible.

Cat. Imperfect right femur.

10. Room xiv, from main flue of hypocaust.

Cat. Right mandible (small species, probably domestic).

Badger. Femur (R).

11. Room xv, from central flue of hypocaust.

Fox. Femur, tibia, scapula, two short humeri and mandible.

REMARKS ON THE REMAINS

Ox. Most of the remains agree with the small Celtic shorthorned ox, *Bos longifrons* of Owen. The mandibles equal those of the Kerry cow, but are a little larger than in the Chillingham cattle (male and female).

There may be another breed represented as the large horn-core is not that of typical *Bos longifrons*. I noted a similar large horn-core among remains from the Roman Villa at Nuthills, near Bowood (*Wilts Arch. and Nat. Hist. Mag.*, XLIV, 1928, pp. 6-7 of offprint). I have seen similar large horn-cores from other places, all found in association with typical *Bos longifrons*. A crushed skull and some large cores were met with in the pre-Roman layer at Scarborough Castle (not yet published); two large cores occurred at the Glastonbury Lake Village (see Glastonbury report); and one or more large cores at All Cannings Cross (see All Cannings Cross report). Both the last citations are Iron Age.

These larger horned oxen have been thought by many to be due to crosses with imported Roman cattle, but I do not subscribe to this view. The matter is a difficult one, as the remains are usually so fragmentary. One cannot tell how the horns were set on the head, or whether they extended forward horizontally or upright.

It is interesting to note that long-horned domesticated beasts were present in Britain in the Neolithic Period and before the Celtic shorthorn. I have seen remains from many places such as Windmill Hill, Whitehawk, etc. These longhorns may be of urus origin as that animal was then living wild in Britain. On the other hand they may be cattle brought into this country with the Megalithic Civilization and may not be derived directly from the urus, but from some southern group, perhaps through Egypt.

REPORT ON BIRD REMAINS

By DOROTHEA M. A. BATE

Bird remains from the villa are rare, being represented by less than two dozen bones. Remains of four species have been identified; these are:

1. <i>Turdus ericetorum</i> Turton	Song thrush
		a single humerus.
2. <i>Tyto alba</i> (Scopoli)	Barn owl
		a coracoid.
3. <i>Scolopax rusticola</i> Linn.	Woodcock
		a humerus.
4. <i>Gallus</i> sp.	Domestic fowl
		various limb bones.

The presence of these birds does not suggest that any definite environmental change has since taken place in this area. A great increase in the number of human habitations has no doubt occurred, but Song thrush and Barn owl could easily be heard not far from the edge of the City at the present day. Woodcock would only be found farther afield, but the presence of this bird may be due to a hunter, for it is a species that in earlier days was frequently caught by trapping.

Remains of the domestic fowl (*Gallus*) have already been recorded from Verulamium, near St. Albans (P. R. Lowe, 1933, *The Ibis*, p. 336); and they are the most plentiful in the present collection, including about a dozen limb bones. Among these are several examples of the metacarpus of small to medium size. Bones of domestic fowls are almost invariably found at Roman sites, often in great quantity. Some are of very large size and, since these have been obtained from sites as far apart as the London Wall and Yorkshire, it seems obvious that they must represent a breed distinct from the more common small to medium-sized race.

Owing to the careful records kept of excavations on archaeological sites it has been possible in recent years to prove the presence of domestic fowls in this country prior to the Roman occupation. The first definite record has come from the excavations at Colchester (Bate, *The Ibis*, April, 1934). This occurrence had already been anticipated by Boyd Dawkins as long ago as 1874 (*Cave Hunting*, p. 80) from representations of the domestic fowl on Gallic coins prior to the Roman invasion of this country, and another probably of the same (shortly pre-Roman) age comes from Kingsdown Camp in Somerset (*Archaeologia*, lxxx, 96-7).

Although of later date, a further record of interest is of remains of domestic fowls from Anglo-Saxon huts in Cambridgeshire (Tebbutt, *Cambridge Antiquarian Soc. Comm.*, xxxiii, p. 146).

CHARCOAL

1. *Oak*. From Belgic Pit II. Much decomposed remains of stake at bottom of pit, near the slave chain (p. 66).
2. *Oak*. Room v, from bottom of post-hole of Clay Floor B (Belgic), poorly preserved.
3. *Oak*. Rubbish Pits III and IV, from black layers.
4. *Oak* and *Hazel*. East entrance to cellar, from remains of charred wood in beam-slot outside the entrance.
5. *Hazel*. Clay Hearth outside east entrance to cellar, from ashes in circular holes in hearth.
6. *Oak* and *Hazel*. Room XI, from soot in stoking pit of hypocaust.
7. *Oak* and *Hazel*. Staircase well, from black layers in filling.
8. *Oak*. Cellar, from burnt layer on floor of cellar. Remains appeared to have consisted of roof timbers, some rectangular, measuring one and three quarter inches by one and a half inches; some semi-circular, measuring three and a half inches by one and three quarter inches, and twigs with a diameter of one and three eighths inches.

Miss K. B. Blackburn writes that the oak from Belgic Pit II (no. 1) showed that 'the vessels of the wood were almost lost, apparently due to pressure while wood was in a half-rotted condition before burning (possibly rotted under wet conditions).'

The oak from the post-hole of Clay Floor B (no. 2), from Rubbish Pit III (no. 3) and from the beam-slot outside the east entrance of cellar (no. 4) 'was wood crumbled into "cubical" bits at the end in a manner reminiscent of timber rotted by fungi—not quite like the square cushions produced by flames licking an exposed beam.' She further says that 'one piece of Hazel was of interest because of its great age for its size—it was one inch across and grew fairly normally though slowly for about twelve years and for a further thirty years or so just kept alive.'

9. *Oak*. Four beams, each measuring two feet seven inches long, five to seven inches square, from the framework at the bottom of the well. (Pl. ixc.)

APPENDIX

EXAMINATION OF THE MATERIALS OF CONSTRUCTION
FROM THE PARK STREET VILLA

By NORMAN DAVEY, D.Sc., Ph.D., F.S.A.
(BUILDING RESEARCH STATION)

INTRODUCTION

The study of the materials used in the construction of the Park Street Villa was confined almost entirely to an examination of the composition of the mortars and concretes, with the main object of determining in what manner they varied throughout the different periods of building. It does not seem that a systematic study along these lines has been carried out on material from other Roman sites in Britain, although studies of this character have been made in Rome by the American Academy of Archaeology with some success: references (1), (2), (3), p. 108.

It is hoped that opportunities will occur for extending to other sites the study started at Park Street.

1. *Lime and lime mortars*

(a) *Lime*. An analysis of a sample of lime (No. 34) from the slaking pit No. 1 shown on the Plan (fig. 3), revealed that it was of a semi-hydraulic type, similar in composition to the present-day local greystone cretaceous limes of the Luton-Dunstable area. This lime would develop some strength and hardness when mixed with sand, but very much more when used in conjunction with an admixture of crushed tile; but further reference to this latter point will be made later.

It is apparent that considerable care was taken in the slaking of the lime, an operation which appears to have been carried out, in the traditional manner, in a shallow pit about 3 ft. across and 1 ft. deep, excavated in the ground. It is probable that the slurry was protected from the weather by being covered with straw, or bracken, as is still done in parts of Europe, the object being to conserve as much as possible of the heat generated during the process of slaking, and so to ensure as complete hydration as possible.

Lime slurry prepared and protected in this manner could be kept for an indefinite period, and could be used as and when needed. When required for the finest class of work, e.g. stucco and fresco work, the putty was not used unless it had been thoroughly slaked for many months. Pliny (4) states that: 'the older the slurry is the better'. He also states that: 'the laws of our ancestors contained a provision that contractors should use no mortar less than three years old, which explains why their stucco was never spoiled by cracking'. In many parts of Europe and in Great Britain, it is still considered good practice to allow the putty to stand at least three months before use, to ensure thorough hydration. The proportioning of the mortar mixes was, no doubt, carried out by volumetric measure, one volume of lime putty to so many volumes of sand.

(b) *Lime mortars used in the construction of the walls*. The walls of the successive buildings were of coursed flints set in lime mortar, and sometimes had occasional lacing courses, and quoins of tile. Twenty-six samples of mortar were taken for analysis. The position from which these and other samples were taken are indicated on a plan which has been deposited with the finds in the Verulamium Museum. The samples were treated with acid, to separate the carbonated lime from the aggregate, i.e. the sand and other ingredients. In this way it was possible not only to study the grading and other characteristics of the aggregate, but also to determine the approximate proportion of lime putty used in the original mixes. A summary of these analyses is given in Table I, in which the samples are grouped according to the respective periods determined by excavation. There appeared to be little difference in the mortars of Periods VIII and IX, and as they apparently all belonged to the first half of the fourth century, they have been grouped together.

The analyses show that the character of the mortar varied considerably during the successive periods. For example, in Period VI the lime content was low and the sand

was coarse pit sand,¹ with little clay and silt. In Period VII the lime content was increased and the sand, probably obtained from another local source, perhaps nearer the river, was of finer grading, with rather more clay and silt, while in Period VIII and IX the mortar was very much richer in lime, and the sand still finer, with more clay and silt than in Periods VI and VII. The sand used in the Period VI was uncrushed. Four of the eight samples of Period VII contained some crushed material. All the samples of Periods VIII and IX contained some crushed material, making the sand sharp and angular.

A further important feature was noticed. In Period VI there was a complete absence of red tile dust from the mortar, while in Period VII, with one single exception (No. 28), traces of tile dust were present, but the addition was so small as to be considered accidental. In Periods VIII and IX, however, with only one exception (No. 12) there was a deliberate inclusion in the mix of crushed tile, and in three instances crushed rubble, while one mix (No. 21) contained chopped straw. The colour of the mortar also varied from orange in Period VI to almost white in Period VIII.²

The average proportions of mix used in Period VI—one volume of lime putty to approximately three volumes of sand—agree with those recommended by Vitruvius.⁽⁵⁾ He stated that: 'when it (the lime) is slaked, then let it be mingled with the sand in such a way that if it is pit sand, three of sand and one of lime is poured in; but if the sand is from the river or sea, two of sand and one of lime is thrown together. For in this way there will be the right proportion of the mixture and blending'. The interesting technical point here is that the use of river and sea sand, which would in general be of finer grading than the pit sand, necessitated an increase in the proportion of lime. For the same reason, the lime content of the Period VII mortars from Park Street, in which the sand was of finer grading, was increased in the manner recommended by Vitruvius, i.e. one volume of lime putty to approximately two volumes of sand.

The general agreement between the proportions of mix used in the Park Street Villa mortars and those recommended by Vitruvius, who wrote somewhere about 27 B.C., or earlier, is not without significance.

Two other samples of mortar not included in the table gave the following results on analysis:

Sample No. 23 — 1 : 1.5, lime : sand (F.M. 2.8) mix with trace of tile dust.

Sample No. 11 — re-used mortar from west wall of cellar—1 : 1.0, lime : sand (F.M. 2.5) mix.

(c) *Mortars for renderings and stucco.* Several samples (Nos. 3, 31-1, 31-2, 31-3, 40 and 45) of renderings were examined; their date is uncertain, but with the exception, possibly, of No. 40, which might belong to Period VI or VII, the position in the building from which they were taken suggests that they belong to either Periods VIII or IX.

The samples were impregnated with resin and sectioned to reveal the separate applications, or coats, of mortar. A more detailed analysis of samples Nos. 40 and 45 was carried out. The following are brief descriptions of the samples:

Sample No. 3	1st coat	$\frac{3}{8}$ in. to $\frac{5}{8}$ in. thick, unevenly applied, of lime : sand mix;
	2nd "	$\frac{1}{8}$ in. to $\frac{1}{4}$ in. of lime : sand mix for levelling;
	3rd "	$\frac{1}{16}$ in. skimming coat of lime putty, followed by a white lime wash.
Sample No. 31/1	1st "	1 in. thick of lime : sand mix;
	2nd "	$\frac{1}{16}$ in. skimming coat with painted surface.
Sample No. 31/2	1st "	$\frac{5}{16}$ in. thick of lime : sand mix;
	2nd "	$\frac{1}{16}$ in. skimming coat with red fresco.
Sample No. 31/3	1st "	$\frac{3}{16}$ in. thick of lime : sand mix;
	2nd "	$\frac{3}{16}$ in. thick of lime : sand mix;
	3rd "	$\frac{3}{16}$ in. skimming coat of cream-coloured lime and calcined flint.

¹ Perhaps acquired, when the pit was dug for the construction of the cellar.

² The yellow colour of the Period IX mortar

is probably due to its high clay content, rather than to a smaller proportion of lime than in Period VIII.

Sample No. 40	1st ,,	1½ in. thick lime : sand mix (one volume of lime putty to 2.3 volumes of clayey sand (F.M. 2.1) containing chopped straw) ;
	2nd ,,	¾ in. thick lime : sand mix (one volume of lime putty to 1.9 volumes of sand (F.M. 2.2), decorated with pink distemper).
Sample No. 45	1st ,,	¾ in. thick lime-tile-sand, (F.M. 3.2) mix (one volume of lime putty to 0.8 volume of crushed tile to 0.8 volume of sand) ;
	2nd ,,	½ in. lime : sand mix (one volume of lime putty to 2.3 volumes of sand (F.M. 2.8)) ;
	3rd ,,	⅓ in. skimming coat of lime putty and fine sand (one volume lime putty to 0.3 volume fine sand) with surface painted dark brown and blue.

Two other samples, Nos. 19 and 20, of mortar, roughly applied to the masonry, gave the following results on analysis :

Sample No. 19 1 : 1.2 lime : sand (F.M. 3.9) mix, with straw and trace of tile.

Sample No. 20 1 : 1.2 lime : sand (F.M. 3.6).

(d) *Pozzolana-lime mortar*. The limes used by the ancients appear, for the most part, to have been of the non-hydraulic type, or semi-hydraulic type as used in the construction of the Park Street Villa. When mixed with sand, the mortar so produced did not harden very quickly, or to any appreciable extent, and the resulting product did not offer much resistance to the penetration of moisture. It seems, however, that the benefits to be gained by adding suitable materials to increase the hydraulicity of the limes were soon recognized, for Vitruvius(6) states that: 'also in the case of river or sea sands, if anyone adds crushed and sifted potsherds in the proportion of one to three, he will produce a blending of materials which will be better for use'.

Such admixtures, known to us today as 'pozzolanas' or artificial 'pozzolanas' (or *puzzuolana*, after *Puzzuoli*, near Naples, where natural pozzolanic earth occurs) possess the requisite compounds of silica and alumina which combine with hydrated lime at ordinary temperatures, and in the presence of moisture, to form stable insoluble compounds of cementitious value such as calcium silicates and calcium aluminates. Suitable 'pozzolanas' are pounded tiles, bricks and pottery, burnt clay, various slags, both natural, such as pumice, and artificial, such as granulated blast-furnace slag, and various earths of volcanic origin, such as trass, *santorin earth*, *keiselguhr*, or diatomaceous earth and zeolite. As far back as Early Minoan times in Crete, the last-named material appears to have been added to lime mortar to give it hydraulicity, and in the Middle Minoan period, the addition of crushed tile was resorted to, in the preparation of the undercoat to the plaster, which was applied to the soft rubble walls, composed of sundried clay and gypsum blocks, and thus helped to protect them from the weather, and the penetration of moisture. (7)

The Romans also used *pozzolana* mortars very extensively, particularly in damp positions where it was important to prevent the penetration of moisture, e.g. for lining the inner surfaces of channels, drains, baths, tanks and aqueducts, for pointing and rendering in damp or exposed situations, (8) for bonding masonry in waterlogged ground, for pavements, for torching roofing tiles to prevent the penetration of driving rain, and in the construction of roof vaults. An early instance of the use by the Romans of lime mortar with crushed tile, or *terracotta*, admixture was in lining the specus of the *Aqua Marcia*, which was built in 144 B.C. (3)

No natural pozzolanic materials were available to the Romans in Britain, and they had to resort to artificial ones, such as crushed brick, tile or pottery. Examples of such mortars occur at Park Street, in the 'opus signinum' floor (Sample No. 5), in the concrete floor (No. 14), in the mortar base to the mosaic floors (Nos. 1 and 18), in the undercoat to some of the wall plasters (No. 45) and in the mortar used for bedding and torching the roofing tiles (No. 6), in fact, in those situations requiring the exclusion of moisture.

Analyses of some of these mixes are given below :

- Sample No. 5 (Similar to Sample No. 7.) One volume lime putty to 1.2 volumes of crushed tile (F.M. 3.5).
 Sample No. 6 One volume of lime putty to 0.25 volume of crushed tile (F.M. 4.3) to 0.5 volume of sand (F.M. 2.7).
 Sample No. 14 One volume of lime putty to 0.2 volume of crushed tile (F.M. 5.7) to 0.1 volume broken chalk to 0.6 volume of gravel (F.M. 6.7).
 Sample No. 45 One volume lime putty to 0.8 volume of crushed tile (F.M. 3.2) to 0.8 volume (F.M. 2.8).

To demonstrate the pozzolanic activity of crushed tile, and its ability to increase the hydraulicity of a lime mortar mix, several pieces of tile from the Park Street Villa were crushed, so that the material passed through No. 7 British Standard sieve. It was then mixed with lime putty, prepared from non-hydraulic high calcium lime (about 98 per cent. CaO), in the proportion of one volume of putty to three volumes of crushed tile. Small beams, measuring 1 in. by 1 in. by 4 in. long, were made from the mix. These were stored in damp air at 20° C. for 28 days, 56 days and 90 days respectively. At each of these ages four of the beams were broken by transverse bending, having been previously soaked in water for 30 minutes. The tensile strength of the mortar so determined was as follows :

After 28 days' damp storage,	54 lb. per sq. in.
„ 56 „ „ „	196 „ „ „ „
„ 90 „ „ „	279 „ „ „ „

When used with a lime of the semi-hydraulic type, as used at Park Street by the Romans, the tensile strength would, no doubt, have exceeded these values appreciably, since the lime they used already possessed some hydraulic properties.

Comparative specimens were made in a similar manner, using the same lime putty with clean, coarse, siliceous pit sand, the proportions of mix and methods of storage and testing being identical. The mortar had no strength at the various ages when tested in the wet condition.

(e) *Parging mixes.* A sample (No. 16) of mortar rendering or parging, taken from the Period VII hypocaust flues, consisted of one volume of lime putty, to 0.6 volume of clay to 1.3 volumes of sand (F.M. 2.6). The clay had changed to a red colour, due to heating by the hot flue gases. A sample (No. 26) of Period VIII from the hypocaust flues at the South end of the Villa, consisted of clay with a trace of chalk and some fine sand particles, probably natural inclusions in the clay.

(f) *Other mortars.* The following are the results of analysis on four samples taken from areas of mortar spread on the ground in and around the Villa.

- Sample No. 17/1 One volume lime putty to 5.4 volumes sand (F.M. 2.0) with a trace of crushed tile.
 Sample No. 17/2 One volume lime putty to 0.4 volume sand (F.M. 2.15).
 Sample No. 17/3 One volume lime putty to 0.9 volume sand (F.M. 2.5) with a trace of crushed tile.
 Sample No. 27 One volume lime putty to 1.0 volume sand (F.M. 3.3) with a trace of crushed tile.

2. Structural materials

(a) *Walling and roofing tiles.* No unusual features were noted with regard to the walling and roofing tiles, which were, no doubt, of local manufacture. A few yellow tiles were introduced in the quoin of the wall at the NE. corner of the cellar. Such tiles, which occur quite frequently in Londinium, and more rarely at Verulamium, were made from clay containing up to 8 per cent. of chalk, either occurring naturally or being added artificially.

(b) *Tessellated floors.* Fragments of two floors were examined. Sample No. 1 had coarse red tesserae of broken tile set in lime slurry on a bed of lime-tile-sand mortar. Sample No. 18 had small white, chalk rock, and grey, argillaceous limestone, tesserae set on a bed of lime-tile-sand mortar, the interstices between the tesserae being filled with pink coloured lime slurry, applied after the tesserae had been set in the mortar bed.

(c) *Natural stones.* Local flint and occasionally blocks of Hertfordshire conglomerate, or puddingstone, were used in the construction of the walls. Other types of stone recognized, in addition to those used in the pavements, were oolitic limestone (No. 32) of the Weldon type, in a shaped block of unknown use, and shelly limestone (No. 33) as a roofing tile, found in the well.

(d) *Timber.* Fragments of charred timber from the infilling of the cellar were identified as oak. Morticed timbers forming a square frame at the bottom of the well were also oak (No. 39).

The writer wishes to acknowledge the generous help given to him by colleagues at the Building Research Station.

TABLE I

SUMMARY OF ANALYSIS OF MORTARS USED IN THE CONSTRUCTION OF THE WALLS

Period	Sample Nos.	Type of sand			Mortar	
		Grading	Clay and silt content ¹	Admixture	approximate proportions of mix: volumes of sand to one volume of lime putty	Colour
1. Late first to mid second cent.	8, 10, ² 25, 29, 48, 49	Coarse sand of natural grading. Av. F.M. ³ = 4.6	low Av. = 9%	nil	Av. = 3.1 Range = 2.2 - 3.9	Orange
2. Late second cent.	15, 28, 42, 44, 46, 47, 50, 51	Sand of variable grading, but finer than Period 1. Av. F.M. = 4.1	medium Av. = 12.8%	trace of tile; probably accidental inclusion	Av. = 2.3 Range = 1.3 - 3.5	Yellow
3. Early fourth cent.	12, 13, ⁴ 21, 22, 24, 30, 41, 43	Sand of finer grading than Periods 1 and 2 Av. F.M. = 3.0	high Av. = 16.3%	deliberate additions of crushed tile and/or rubble	Av. = 1.2	White
4. Middle fourth cent.	4, 9				Range = 0.5 - 1.9	

¹ Material through No. 100 B.S. sieve.

² This sample was from the burnt surface of the wall and is not included in the averages.

³ The 'Fineness Modulus' (F.M.) is a convenient way of comparing the relative fineness of various sands. It is obtained by adding the percentages, by weight, of material retained on a range of nine selected sieves and dividing the result by 100. The British Standard sieves used are $1\frac{1}{2}$ in., $\frac{3}{4}$ in., $\frac{1}{2}$ in., $\frac{3}{8}$ in., No. 7, 14, 25, 52 and 100. A low 'Fineness Modulus' means that there is a high percentage of fine material; a high 'Fineness Modulus' means that there is less fine material.

⁴ Similar to Sample No. 2.

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- (1) Esther Boise van Deman. 'Methods of Determining the date of Roman Concrete Monuments.' *American Journal of Archaeology*, vol. xvi, 1912, pp. 230, 387.
- (2) Esther Boise van Deman. 'The Building of the Roman Aqueducts.' Report 423, Carnegie Institution of Washington, July, 1934.
- (3) Tenny, Frank. 'Roman Buildings of the Republic.' Vol. III. Papers and Monograph of the American Academy in Rome, 1924.
- (4) C. Plinii Secundi. *Naturalis Historiae*, Liber xxxiv, cap. xxiii, Sect. 55 (see K. C. Bailey : 'The Elder Pliny's Chapters on Chemical Subjects,' Part II. Arnold, London, 1932).
'. Intrita quoque ea quo vetustior, eo melior. In antiquorum aedium legibus inventitur, ne recentiore trima uteretur redemptor; ideo millae tectoria eorum rimae foedavere'
- (5) *Vitruvii de Architectura*. Liber II, cap. v, (see Frank Granger's translation, Wm. Heinemann, London, 1931).
'. Cum ea erit extincta, tunc materia ita misceatur, ut, si erit fossicia, tres harenae et una calcis infundatur; si autem fluviatica aut marina, duo harenae una calcis coiciatur. Ita enim erit iusta ratio mixtionis temperaturae'
- (6) *Vitruvius*. Book II, chap. 5.
'. Etiam in fluviatica aut marina si qui testam tunsam et succretam ex tertia parte adiecerit, efficiet materiae temperaturam ad usum meliorem'
- (7) Noel Heaton. 'Minoan Lime Plasters and Fresco Painting.' *Journal R.I.B.A.*, 30th September, 1911.
- (8) *Vitruvius*. Book VII, chap. 4. Pliny Book xxxiv, chap. xxiii, Sect. 55.

NOTE ON THE APPENDIX

By B. H. St. J. O'NEIL, M.A., V.-P.S.A.

The elucidation of the periods of construction of the villa depended very largely, at least in the first instance, upon the types of mortar employed. These varied in colour and composition from orange gravelly in Period VI, to buff gritty in Period VII, white gritty in Period VIII and again yellow or buff gritty in Period IX. Dr. Davey's most careful and interesting report has, by analysis, confirmed these conclusions, first arrived at by eye. Since Roman mortars cannot yet be dated solely from their own content, he has naturally relied for his dating upon the general archaeological conclusions, but it is much to be desired that such analyses shall be multiplied in various areas, which have similar materials available, so that eventually it may be possible to use types of mortar for at least relative dating.

He is able to show the care taken in mixing mortars in accordance with the maxims of Vitruvius, the attention paid to the slaking of lime, and the common inclusion of crushed tile, once it was available in abundance. It may be supposed from the sparing use of bonding tiles in Period VI that no debris of that kind was then available for mixing in the mortar at that time. Another interesting feature is the amount of clay used in the mortar of the flue in Room v, where its heat-resisting quality was of service.

In the courtyard west of Room XI two mortar spreads were found. The lower, buff gritty, covered a large area and sealed parts of Rubbish Pits III and IV, which contained much pottery. Dr. Davey's analysis shows that this mortar corresponds with that of the walls of Period VII, and there can be little doubt that it is coeval with those walls. It is, therefore, permissible to use the pottery evidence from the sealed Rubbish Pits to date the construction of Period VII.

The upper mortar spread, white gritty, lies over the buff spread, but is quite restricted in area. Analysis showed that it resembles the mortar of Period VIII, but lacks crushed tile. It may be, therefore, that it was not laid deliberately as a courtyard paving, which seems to have been the purpose of the buff spread, but was a temporary mixing-floor during the construction work of Period VIII. In this particular mix it seems that crushed tile was not to be added, or had not yet been added when the floor was disused.

PARK STREET VILLA. ANALYSIS OF MORTARS TAKEN FROM THE WALLS

Period (N.E.O.N)	Sample No.	Location	ANALYSIS OF AGGREGATE											Approximate proportions of mix: volume of aggregate to one vol. lime putty	Remarks		
			Sieve analysis—percentage, by weight, retained on British Standard Sieve:										Fineness Modulus			% Clay and silt through No. 100	Admixture
			1½ in.	1 in.	¾ in.	½ in.	No. 7	No. 14	No. 25	No. 32	No. 100						
VI	8	N. wall cellar, 2 ft. above floor	0	0	8	33	54.8	67.9	76.6	91.6	96.6	4.3	3.4	—	3.9	Yellow mortar-lean mix. Gravel of natural grading. Complete absence of tile.	
	10	S. wall cellar, W. of recess	0	0	49	61	69	76.5	84	93.4	96.4	5.3	3.6	—	1.3		
	23	S. wall R. I	0	0	29.8	42.2	51.1	57.0	64.4	79.9	87.1	4.1	12.9	—	3.4		
	29	E. wall, R. II	0	7.9	30.8	48.8	58.0	63.6	70.6	83.8	90.5	4.5	9.5	—	2.8		
	48	N. wall, R. V	0	6.7	31.1	43.5	51.8	61.4	68.6	80.0	87.0	4.3	13.0	—	3.2		
	49	E. end N. wall cellar, 6 ft. above floor	0	0	27.0	41.0	51.2	59.0	67.8	83.0	89.8	4.2	10.2	—	2.2		
		Average:	0	2	29	45	56	64	72	85	91	4.6	8.8	—	2.8		
VII	13	E. wall, S. end of Corridor	0	0	26.3	41.0	51.7	58.6	66.4	82.4	87.0	4.1	13.0	t	3.5	Buff mortar rather richer than Period VI. Sand of variable grading but generally finer than Period VI, and more clay. Trace of tile, most probably accidental inclusion.	
	24	N. wall, R. XII ¹	0	0	8	19.4	30.3	41.4	54.7	69.4	80.7	3.0	19.3	tR	1.4 ¹		
	23	N. wall, R. XIII ²	0	0	10.1	15.7	22.5	33.4	50.9	70.8	85.3	2.8	14.7	t	1.3 ¹		
	28	W. wall, Corridor N. of R. XI	0	15.5	37.5	48.4	57.0	62.6	69.9	80.1	89.5	4.6	10.5	—	1.5		
	42	W. wall, S. end of Corridor	0	0	21.6	30.0	39.0	47.5	58.3	72.3	84.2	3.5	15.8	t	1.5		
	44	E. wall, R. VIII	0	4.6	29.3	37.3	42.0	45.6	51.7	71.3	90.0	3.7	10.0	tR	1.8		
	46	N. wall, R. IX	0	21.9	48.0	56.3	62.2	66.5	72.6	82.5	89.5	5.0	10.5	t	2.8		
	47	W. end, N. wall cellar, base	0	0	23.8	41.3	54.4	62.6	70.2	79.6	85.2	4.2	14.8	t	1.3		
	50	E. wall, S. end of Corridor	0	0	8.8	22.8	30.2	37.5	45.3	58.2	74.0	3.6	14.5	t	2.3		
	51	E. wall, S. end of Corridor	0	0	19.9	37.2	48.0	55.3	64.0	79.0	87.0	3.9	13.0	t	3.4		
		Average (including 23 and 24):	0	5	25	32	44	52	62	76	86	3.8	13.6		2.1		
VIII	4	N. wall, R. XV	0	0	9.5	18.9	29.4	42.9	61.7	77.5	89.8	3.3	10.2	T	0.5	Cream mortar. Richer than periods VI and VII. Sand finer than previous- ly and clay content higher. Deliberate additions of tile.	
	12	Jamb W. wall cellar	0	0	8.0	14.0	22.6	32.5	47.6	71.4	89.5	2.9	10.5	T	0.6		
	13	S. wall cellar, E. of recess	0	0	20.0	26.0	37.9	46.8	56.4	73.9	88.1	3.5	11.9	T	1.2		
	21	Side of opening W. wall opposite cellar	0	0	1.8	3.9	10.9	23.6	42.8	60.9	77.2	2.2	42.8	TS	1.4		
	22	Pillar R. XIII	0	0	6.8	12.8	21.3	32.5	50.2	70.0	84.7	2.8	15.3	T	1.4		
	30	Side of Entrance to hypocaust R. XI	0	0	4.5	7.6	15.4	27.9	45.6	62.6	76.6	2.4	23.4	T	1.1		
	41	E. wall, R. XIII	0	0	11.8	18.4	25.9	36.6	52.3	66.7	80.4	3.0	19.6	T	1.9		
	43	W. wall, R. VI	0	4.1	20.2	26.0	31.1	40.6	54.0	67.7	80.0	3.6	20.0	TR	1.6		
		Average:	0	0.5	10	16	24	35	51	69	83	3.0	16.7		1.2		
IX	9	W. wall cellar	0	0	26.0	30.0	33.2	49.3	65.4	79.8	89.5	3.7	10.5	tR	1.0		

Note: t denotes trace of crushed tile probably accidental.

T denotes deliberate tile admixture.

R denotes crushed rubble admixture.

S denotes straw in mix.

¹ Probably Period VI.

² Probably later than Period VII, but earlier than Period VIII.

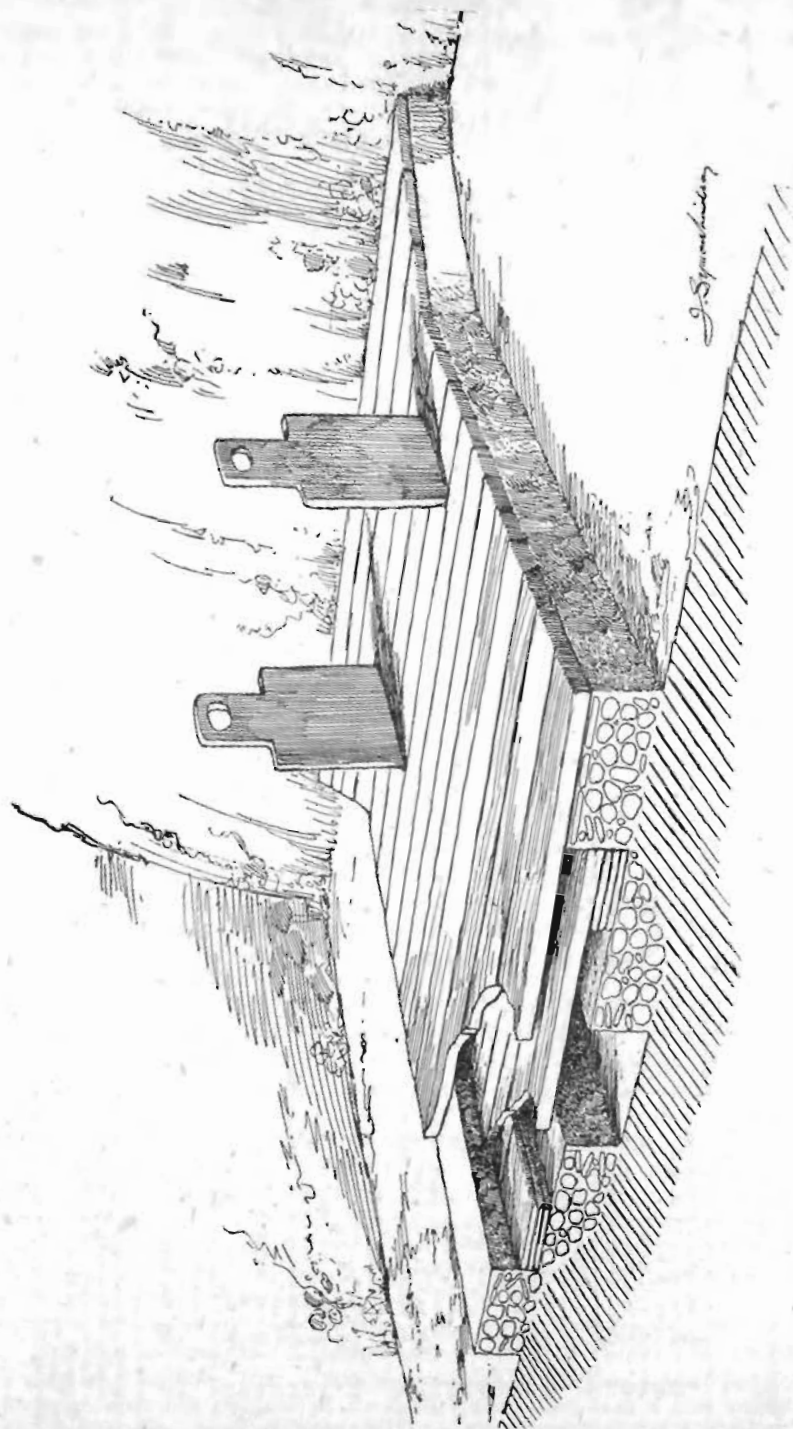


FIG. 24. RECONSTRUCTION OF CORN-DRYING FLOOR