XX.—*On a Roman villa in Spoonley Wood, Gloucestershire; and on Romano-British houses generally.* By Professor J. HENRY MIDDLETON, F.S.A.

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ROMAN VILLA IN SPOONLEY WOOD, GLOUCESTERSHIRE.

THIS recently discovered Roman villa stands at the foot of a hill, in a very beautiful situation, in one of the valleys of the Cotswold hills, about three miles from Winchcombe, in Spoonley Wood.

This elevated and yet sheltered district, with its rich soil and fine timber, appears to have been a favourite place of residence for wealthy Romans.

Remains of several other houses of Roman date have been found within a short distance of Spoonley, and no doubt many others still remain hidden below the soil.

The valley where the Roman villa I am about to describe stands is the property of Mrs. Dent of Sudeley castle, and the thanks of all antiquaries are due to her for the trouble and money she has expended, both in excavating this very perfect example of a Romano-British house, and also in roofing over and protecting in other ways the crumbling walls and mosaic pavements of the house: a very important and difficult task, which, in this case, has been carried out with unusual judgment and skill.^a

The general plan and arrangement of the Spoonley villa are similar to those adopted for many other Roman houses in Britain, and more especially in Gloucestershire.

^a Much of the skilful protection of the remains is due to the Rev. W. Bazeley, Hon. Sec. of the Bristol and Gloucester Archaeological Society, who has given much time and trouble to the superintendence of the excavations.

This plan, which appears to be a typically British one, is very unlike the usual plan of Roman villas in Italy.

Instead of rooms grouped round open atria and peristyles, with large unglazed windows or even open archways directly facing into the roofless atrium, we find a system far more suited to the colder and damper climate of Britain.

The larger villas of this type are in the form of a complete quadrangle, with a *porticus* or covered verandah, very like a medieval cloister, running round all four sides in the interior of the quadrangle. The windows of the villa opened on to the interior of the square, and were sheltered by the roof of the "cloister," as well as by being furnished with glazed casements.

The villa at Woodchester is one of the finest and most perfect of this cloistered quadrangle type.

In other cases, as we see at Spoonley, the rooms, with their sheltering verandah, only extended along part of three sides of the square; and the rest of the space was merely surrounded by a precinct wall enclosing a large courtyard in front of the villa (*see* plan, Plate XVII.).

The whole space occupied by the villa and its courtyard is (roughly) about 170 feet by 190 feet.

The villa stands facing N.W. with its back to the hill; and close by it, on the N.E. side, a stream runs, with a plentiful supply of very pure and cool water springing from the limestone hill behind the house.

The approach to the house is through a wide doorway in the centre of the wall of the courtyard, exactly opposite the main entrance through the verandah into the chief public room or *tablinum*.

A roughly-paved path led across the court from the outer doorway to the house.

The only other door into the court was near the chief furnace-room on the S.W. and was probably intended for the use of slaves passing from the interior of the villa to get wood and attend to the fire for the baths.

The general distribution of rooms appears to have been as follows:

In the central block the chief living rooms, including the winter *triclinium* and the kitchen.

In the S.W. wing, the baths, and some well-warmed apartments for winter use.

In the N.E. wing, a series of unheated rooms, perhaps for use in summer, or possibly for the slaves who attended to the indoor work of the house.

As there is no internal communication between this wing and the rest of the house, this latter supposition is perhaps the more probable.

The verandah is carried all round the three blocks, except at its two ends, where it is stopped on the S.W. side by the projecting cold bath-room, and on the opposite side by a room of similar proportions and size.

In looking at the plan as a whole, one is struck by its uniformity on the two sides of the central *tablinum* (No. 21). The architect has evidently thought that a perfect balance of wing with wing was essential to the good effect of the whole composition.

I will now give some description of the various rooms in each block, beginning with the end of the S.W. wing, by the small side door out of the courtyard.

No. 2 on the plan is a chamber for stoking the large furnace (3), which heated the baths.

This chamber has an external door, by which wood could be brought in to feed the furnace.

At 4 is the entrance to the baths from the courtyard. On the left of the entrance-passage is a cold bath, about 16 feet by 11 feet 6 inches, with, on one side, a wide opening to the passage. Two steps lead down into the bath. The floor is formed of flag-stones, covered, together with the walls, by a thick coating of the hydraulic *opus signinum*, or cement made of lime and pounded brick or pottery, a similar cement to that which is always used to line the channels of Roman aqueducts.

Vitruvius frequently recommends this use of pounded pottery, *e.g.* at II. v. § 1, “*si quis testam tunsam et succretam ex tertia parte adjecerit, efficiet materiæ temperaturam ad usum meliorem.*”^a

In the Spoonley villa, this *opus signinum* is also used for another purpose; it had not only the property of resisting water, but it could also resist fire, and so the interior of the stone furnaces and the horizontal smoke flues under the floors, to some distance from the furnaces, were thickly lined with *opus signinum* in order to protect the stone, which would otherwise have been calcined into lime.

Nos. 5, 7 and 8 are bath-rooms, with hypocaust floors covered with elaborate mosaics.

The whole of this group of bath-rooms is completely cut off from the rest of the house, and could only be entered from the open court.

The hypocausts of all three rooms were heated from the same furnace (3); and the smoke and hot air finally escaped in square flue-pipes up the walls of room No. 8.

^a See also Vitruvius, VII. i. § 5. Pliny's remarks about the use of *testae tunsae* (*Hist. Nat.* xxxvi. 54), are copied from Vitruvius, as is nearly all that Pliny wrote about architectural matters.

Beyond the bath-rooms is another range of apartments (Nos. 10, 12 and 13), with hypocaust floors heated by a second furnace (No. 11) projecting outside the house.

As in the case of the bath-rooms the hot air was carried up above the roof in flue-tiles set in the walls of the more distant rooms. These vertical flue-tiles are shown on the plan.

This list of rooms completes the S.W. wing.

The verandah (No. 9), which sheltered the inside of this wing, has its floor at a lower level than the rest of the villa. Two steps lead down to it at the end, and also at the doorway into the court. At the N.W. end the verandah is stopped by the projecting cold bath.

In the central block, No. 14 was evidently the kitchen: in it is a circular well neatly lined with stone, 2 feet 8 inches in diameter, No. 15 on the plan.

Nos. 16, 16, indicate some old stone steps which have been used to mend the paving of the kitchen and of the verandah outside it, which in other places was paved with a plain mosaic made of large *tesserae*. There was probably a good deal of traffic at this point, and hence the floor-mosaic needed repair.

At 17 are the two stone uprights of a table, of which the top slab is now missing.

The two unheated rooms by the kitchen, at the south angle of the house, were probably store-rooms for food, or other servants' offices.

Next to the kitchen comes a large chamber into which projects a small, well-heated room (No. 18), with its mosaic hypocaust floor raised 2 feet 8 inches above the general floor-level, and approached by a short flight of stone steps.

From the position of this room, near the kitchen, and the design of its mosaic floor, it was evidently the winter *triclinium*. The part occupied by the dining-tables has a mosaic of plain large *tesserae*, while the rest of the floor has a very elaborate pattern.

A projecting furnace (No. 19) heated the hypocaust of the *triclinium*, and on the opposite side is a small low arch (No. 20), opening into the space under the *suspensura* floor, to enable the slaves to clear out the accumulated soot and ashes among the *pilae* which support the floor.

The same furnace communicated with horizontal stone flues running under the floors of several rooms (Nos. 21, 23, 24 and 25) in the central block, which were probably living rooms for winter use.

The central chamber in the central block appears to be what is usually called the *tablinum* (No. 21), a large room in two parts, with a wide opening between them.^a

^a See Vitruvius, VI. iii. § 5.

The main entrance to the house (No. 29) is opposite the *tablinum* door.

No. 22 shows a block of masonry which at some time has been added, blocking up the walk along the verandah, for what purpose it is impossible now to say.

Beyond the group of well-heated rooms, at the end of the central block, is a large hall (No. 26), 41 feet long by nearly 18 feet wide, which has no hypocaust or hot-air flues under its floor. It is difficult to say what its use may have been.

The N.E. wing has no internal connection with the rest of the house, and consists of rooms with no hypocaust floors or other visible means of heating. This may have been the range of working and living rooms of the household slaves.

The verandah along this side is stopped by a projecting room, which balances the cold-bath room in the opposite wing.

A low solid mass of masonry at the end of the N.E. wing (No. 28) may possibly have been the base of a domestic altar.

The rest of the circuit of the court is merely enclosed by a single wall, 2 feet thick.

It appears probable that the owner of this house possessed a sufficient number of slaves to cultivate a farm of considerable size.

The large granary, shown in my plan a short distance from the house, bears witness to this, and there are probably considerable further remains of farm buildings to be discovered below the present level of the ground.

Very little of the existing walls of the house were standing to a greater height than from two to three feet.

The whole upper surface of the walls has now been carefully levelled, by using the old stones which had fallen down, in order to protect the exposed walls from further injury.

Materials and Construction.—As is usual with Roman work this villa is almost wholly built with the nearest local materials.

The walls, which average about 2 feet thick, are built of the soft oolitic limestone of which the Cotswold hills mainly consist. The blocks are small and roughly squared; the mortar, being made of the inferior "fat" lime, obtained by burning the same oolitic stone, has almost wholly perished, as also the stucco which once covered the walls.

In fact, the only cement which still remains is part of the *opus signinum* mentioned above, in which the pounded pottery has given strength and durability to the soft local lime.

Bricks appear to have been rare, and are very sparingly used for the *pilae* of one or two of the hypocaust floors, especially that of room No. 10 on the plan.

The vertical flue-tiles up the walls of some of the rooms are all of burnt brick of the usual type, about 7 × 5 inches in section.

The few *pilae* bricks which have been found average 12 to 16 inches square by about 1½ inch thick.

The upper story with the sleeping apartments appear to have been of wood.

The whole of the roofing was covered with the "Stonesfield slates," which were so much used by the Romans in this district of Britain.

Numerous quarries where this "Stonesfield slate" could be obtained exist among the Cotswold hills—one of them within two or three miles of Spoonley Wood.

These slates were cut into a lozenge shape, about 16 to 17 inches long by 11 or 12 inches wide. Each was drilled at its upper angle and fastened by a very massive iron nail, as is shown on the drawing of the verandah.

The best-preserved mosaics have been roofed over by Mrs. Dent to protect them; sufficient of the original Roman slates were found in a perfect state to cover most of these new roofs, which thus show in a very interesting way what the original appearance of the Roman roofing must have been.

At the same time this has proved the best way to save the Roman slates from injury or loss.

The verandah (9, 9) which sheltered the inside walls towards the court appears to have consisted of rows of stone columns resting on a dwarf wall, and supporting a lean-to roof, as I have shown in the accompanying restoration (Plate XVIII.).

Almost the only doubtful point is the distance at which the columns were spaced from centre to centre.

These columns are worked in the local oolite, with very delicately-moulded capitals and bases. In some cases the whole was worked out of one block of stone.

The mouldings, of which I have given sectional drawings (Plate XIX.), are very interesting from the great minuteness of their members, and their unlikeness to any capitals or bases which are found in Italy. Of all the classical styles they approximate most nearly to the Roman Doric, but at the same time the designs show distinct local peculiarities.

In many respects these mouldings resemble some of those used in medieval English Gothic work more closely than any of the usual classic forms.

As is often the case with Roman columns, these from the Spoonley verandah appear to have been worked, mouldings and all, on a lathe.^a

^a See Pliny, *Hist. Nat.* xxxvi. 19.

Note.—The woodwork of the roof is conjectural.

SECTION OF THE VERANDAH,
RESTORED FROM EXISTING EVIDENCE.

SPOONLEY VILLA, GLOUCESTERSHIRE. — SECTION AND ELEVATION OF THE VERANDAH.

FIGS. 1—4, SECTIONS OF CAPITALS AND BASES FROM THE SPOONLEY VILLA.

FIGS. 5, 6, SECTIONS OF BASES FROM THE GREAT WITCOMBE VILLA.

(All the above are half full size, except Fig. 5, which is quarter full size).

The floors of most of the rooms appear to have been of mosaic, but, in some cases, stone flags were used.

In the verandah the floor was of mosaic, without any pattern, made of grey and white *tesserae*, about an inch square.

In some of the rooms very delicate mosaics were found, with elaborate patterns of the usual kinds, but formed with unusually small *tesserae* very carefully fitted. This minuteness of workmanship in mosaic is usually a proof of early date.

Under the earlier emperors small well-jointed *tesserae* were used, but in the second century A.D. the mosaics became rapidly coarser, with large carelessly-fitted *tesserae*; till, under Diocletian, at the end of the third century, Roman mosaics reached their lowest point of degradation, both in design and in workmanship.^a

With such very beautiful and delicate mosaics as these in the Spoonley villa, we may, I think, safely date the building before the year 100 A.D.

The minutely-worked mouldings of the verandah columns afford another proof of early date, as, in the case of Roman mouldings, we find a rapid degeneration taking place in the second century, just like that of the mosaics. The mouldings get steadily coarser, their members larger, and the execution rougher.

As I have already mentioned, the space under the tables in the winter *triclinium* has quite plain mosaics, while the elaborate pattern is concentrated in that part of the room where the floor would be most visible. In the same way in the bath-rooms (Nos. 7 and 8) a wide plain border round the walls probably marks the place where benches for the bathers were placed.

Great variety and brilliance of effect is gained in these very beautiful mosaics by means of very simple colours and materials. The red is of burnt brick, very bright in tone; the white is a very fine close limestone; blue-grey a hard lias limestone; pale blue another variety of limestone; and pale yellow, a very hard close-grained stone. Great skill is shown in the way these various tints are arranged so as to enhance each other's chromatic value, and the general effect of these stone and brick mosaics is quite as rich as that of the most costly marble *tesserae* of Italy or Numidia.

The patterns, too, are exceptionally rich and graceful, in most cases geometrical or conventional floral designs, which in the hands of Roman artists were always very superior to their rather clumsy subjects with figures of gods, men, or animals.

^a The most minutely delicate mosaics in Rome are those of buildings dating from the reign of Augustus, as, for example, the Regia and the temple of Castor in the Forum, and in the so-called House of Livia on the Palatine hill.

A very rude panel with the bust of a man holding a rake was found in room No. 5. This has been taken up and framed; as the rest of the mosaic in that room was too much broken up to be saved or repaired.

Unfortunately the mosaics were not bedded in the cement made with pounded brick which was used for the furnaces and the cold bath, and so the whole of the *rudus* and *nucleus* is now in a soft, pasty state; and there is nothing to hold the *tesserae* in their place.

Heating Arrangements.—With regard to the system of heating employed in the Spoonley villa we find that a very large proportion of the house was heated, and that three distinct furnaces were provided.

In many cases, instead of the usual hypocausts with *suspensurae* supported on rows of *pilae*, the rooms were warmed by horizontal stone flues, about 6 by 8 inches in section, running under the floors, thus giving a much more moderate heat than when the whole space under the floor was hollow and filled with hot air from the furnace. Various gradations of heat were given to different rooms by building more or fewer of these horizontal flues.

In some rooms only one flue seems to have run straight across, while in others the flues branched off in different directions leading to the vertical flue-tiles at various points in the walls; thus giving a much larger surface of heated floor.

In room No. 24 this complicated system of flues (shown on the plan) must have given nearly as much heat as the *suspensura* and *pilae* system.

In the heated rooms great care was taken to make the door fit closely, so as to keep out the cold air. The door-sill and jambs were formed of large blocks of stone with a rebate, against which the door shut, carried all round the doorway. This is shown on the drawing of the verandah.

Each sill has in it a round hole to receive the bronze pivot on which the door worked, and, at the other end, a square hole for the bolt to drop into.

Granary.—At a distance of 50 or 60 feet to the N.W. of the villa are remains, not yet completely excavated, of part of the farm buildings which belonged to the owner of the house.

The chief part which is now visible is a large barn or granary, about 54 feet by 34 feet 8 inches wide (*see* plan).

This seems to have been very like a medieval barn, with two rows of wooden pillars supporting the roof, and dividing the building into a “nave” 17 feet 2 inches wide, with “aisles” 8 feet 9 inches wide.

The side walls are now only about 2 feet high, and the wooden pillars are, of

course, wholly gone, but many of their stone bases remain, each formed of one block resting on a rough foundation. In the top of each block is cut a mortice-hole to receive the tenon of the wooden post to which it formed a base (*see plan*).

Vitruvius (VI. vi.) gives an interesting description of the farm buildings, which were usually adjuncts of a country villa, the *granaria*, *horrea*, the stables for cart horses and cattle, and other buildings of the same class.

Among the various objects discovered during the excavation of the Spoonley villa none are of any exceptional interest.

In metal, were some iron knives and tools, door-hinges, and a very pretty little bronze bowl plated with silver, like a mirror.

The pottery is of common Roman forms, including some fragments of so-called Samian; and of local ware some urns, two-handled cups, and *mortaria*, the interiors of which are studded with grit in the usual way, to facilitate the bruising of soft cooked vegetables.

Many pieces of window-glass were found, and a fragment of a glass *patera*, with a simple pattern of rings and lozenges cut with the lapidary's wheel.

A large number of small bronze coins were dug up here, and at other places in the neighbourhood, mostly of Tetricus, Victorinus, Claudius Gothicus, and Constantine, together with a few of Carausius and Allectus. A large number of bronze coins of the last two emperors have recently been found in various parts of Britain, so that they are now much less rare than they used to be.

ROMAN HOUSES IN BRITAIN.

I may perhaps be allowed to add to these notes on the Spoonley villa a few general remarks on Roman houses in Britain, and the chief points in which they differ from Roman houses in Italy. These differences fall naturally under two separate heads: first, those due to the colder climate, and second, those which came from the use of different local materials.

I. *Climate*.—Though devoid of originality or even of good taste in artistic matters, the Romans were above all things a thoroughly practical people; skilful engineers rather than graceful designers, and so it is natural to find that their first thought was to build their houses in the manner which was most comfortable and convenient in the special country where each was situated.

Thus we find that, as early as the time of Augustus, Vitruvius writes (VI. i. § 2) “sub septentrione aedificia testudinata et maxime conclusa et non patentia, sed conversa ad calidas partes oportere fieri videntur.” That is to say, that houses in northern countries were to be wholly roofed over,^a and as much shut in from the cold as possible, as well as being set facing a warm aspect.

I may here remark that many writers on Roman houses seem to have fallen into two errors—first in thinking that the Romans had one fixed type of house, and, second, in writing as if all the rooms of a Roman house, bedrooms included, were on the ground floor.

Now the truth is, that even in Italy the Romans built their houses, especially the country villas, with very great diversity of plan; each house was designed specially to suit its site, aspect, the lie of the ground, the best views that could be got, and many other practical considerations, so that it is a serious error to treat this subject as if any one fixed type existed. Again, with regard to the upper stories, the ancient Romans seem to have had nearly as much objection to sleeping on the ground floor as the modern Italians have, and a house of any importance which had no upper story was probably as rare as it is in England now. In Pompeii every house had at least one upper floor.

In many cases, even remote from crowded cities, houses of great height, with three or four stories, seem to have been frequently built by the Romans.

Very interesting evidence of this was supplied by a mosaic picture found a few years ago in Algeria, but now destroyed.^b

This mosaic, dating from the fourth century A.D., was one of those found in the large villa of a Roman pro-consul of Northern Africa; the picture itself gave a perspective view of the exterior of the house which contained it. The house is of great extent and height, with square tower-like projections at the angles; it varied from four to five stories in height, with large latticed windows in the upper stories, and very few windows with iron gratings on the ground floor. The general aspect of the house is not unlike that of a medieval palazzo in Italy.

In Britain the reasons for not sleeping on the ground floor would be no less strong, and though in many cases the upper stories of Romano-British houses

^a Vitruvius uses the word “testudinata” for roofing generally not necessarily implying a curved vault. Cf. VI. iii. § 2.

^b Drawings of this valuable mosaic were published by the French Archaeological Society at Constantine, under the title *Les Mosaïques d'Oued Atmenia*. In other cases, such as in reliefs, when houses are represented, we nearly always see the same system of having the large well-lighted rooms on an upper floor.

were built of wood, yet we must not expect to find sleeping apartments among the ground-floor rooms, which are, in Britain, all that we can ever hope to see still in existence.

The main difference that the colder climate of Britain caused in the plan and arrangement of Roman houses was that the roofless *atrium*, so common in Italy, was usually omitted.

The Roman *atrium* was surrounded by rooms which had large unglazed openings facing straight into the roofless space. This, at least, was the Roman custom during the early years of the empire, as we see in the so-called "House of Livia" on the Palatine hill; a method only suited to a hardy race of people living in a mild climate.

Instead of rooms opening on to these roofless *atria*, we find in Britain that the windows of the house were much more universally glazed, and in a large number of cases a further protection against cold and rain was given by a sheltering verandah, which was carried along the whole line of building.

The villa at Spoonley is a good typical example of this system: the further development of this plan was such an arrangement as we see at Woodchester and Lydney in Gloucestershire, where the buildings form a complete quadrangle round which the verandah is carried like a monastic cloister.

It is interesting to note that there is in Rome one house which is designed rather in the British than in the usual Italian fashion.

This is the House of the Vestals, of which I have published a plan in *Archaeologia*.^a This house was built for the use of six wealthy and luxurious ladies, and that is probably the reason why the plan adopted is the warmest and most comfortable that could be devised, quite unlike the usual airy open houses of Italy.

In the Vestals' house the verandah round the quadrangle consisted of a magnificent marble peristyle, with two orders of columns, one above the other, but, in spite of this difference of material, the plan as a whole is far more like that of a British than of an Italian house. Even in the Vestals' house, however, the central *tablinum* was open to the peristyle, whereas in Britain it would probably have had a door and glazed windows, as is the case at Spoonley.

Though many windows in Roman houses in Italy were filled in with glass, set in casements of wood or bronze, yet it seems not to have been uncommon, at least in early times, to omit the glass, and merely fill in the opening with a metal grill or a thin slab of marble pierced with holes, forming some simple grill-like pattern.

^a Vol. XLIX., p. 391 *seq.*

In Britain, on the contrary, the use of glass for windows seems to have been far more common. Sheet, crown, and even cast slabs of plate glass were used. Even ground glass for obscured windows has been found.

In most instances the panes of glass seem to have been set in wooden casements, but in some cases the casements were of bronze, very like the one found in Pompeii, divided by "glass bars" into four small panes, which were kept in their place by a moveable screw nut, so that a broken pane could be readily replaced.^a

It is not usually known that even stained glass windows were used by the Romans. Considering their wonderful skill in making glass of various brilliant colours, it would have been strange if they had never used coloured glass for windows.

These stained windows appear to have developed out of the use of pierced marble slabs for filling in window openings. At first the piercings were left open, but then in some cases bits of brilliant coloured pot-metal were cut to the right shape, and fitted into the holes in the marble, different colours being selected for various parts of the open pattern, thus giving a rich jewel-like effect, very like the glass and stucco windows used by Moslem races in Egypt, Persia, and elsewhere.^b

In Italy plates of talc (*lapis specularis*) and other natural transparent substances were used for windows, especially in early times, but in Britain the use of glass appears to have been universal. Pliny^c mentions a special blue glass called "cylon" which was used for windows. Another point in which Romano-British houses differed from those in Italy was the far more general use of methods of artificial heating.

In Italy we usually find that a very small part of the house possessed hypocaust floors.

For example, in the large and magnificent villa of the younger Pliny, at Laurentium, so minutely described by him in one of his letters,^d only two small rooms appear to have had any arrangement for heating.^e

He describes one of them thus: "Adhaeret dormitorium membrum, transitu

^a The use of the screw (*cochlea*) was known to the Romans, though during medieval times it seems to have been forgotten.

^b Justinian's church of St. Sophia at Constantinople had pierced marble windows filled in with pieces of coloured glass: some which exist are of cast, not blown glass, of a deep sapphire blue; each piece is about 9 × 7 inches.

^c *Hist. Nat.* xxxiii. 162.

^d *Ep.* ii. 17.

^e See Haudebourt, *La Laurentine Maison de Pline*, Paris, 1838.

interjacente, qui *suspensus et tubulatus* conceptum vaporem salubri temperamento huc illuc digerit et ministrat." The phrase *suspensus et tubulatus* would mean "having a hypocaust floor and flue-tiles up the walls," but this reading is a purely conjectural one which does not occur in any of the MSS. and the word "tubulatus" is not used in this sense by any other writer. All that can be said is that the emendation is a possible one.

In this respect, as well as in plan, the House of the Vestals is very like a Romano-British house.

Not only on the ground floor, but even upstairs, there are whole suites of rooms which have hypocaust floors, giving an amount of heated space which is far in excess of what was usual in Italy.

In some Romano-British villas more than half the rooms are provided with hypocausts.

In this respect also the Spoonley villa is a good typical example of its class. A reference to the plan will show how large a proportion of floor-space is heated, either with hypocausts or with horizontal smoke flues.

Moreover, in Italy, it is, as a rule, only in hot baths that we find the square flue-tiles, which were fixed against the walls and so caused not only the surface of the floor, but also the whole area of the wall to radiate heat.

But in Britain, as for example at Spoonley, we find many cases in which the wall flue-tiles are used not only in the baths, but also in the living rooms of houses, and in many other ways far greater care was taken to heat the houses in this country than those in Italy.

It had for long been a very doubtful question how the smoke from hypocausts and wall-flues was finally discharged into the air above the roof of the house. No existing Roman house is sufficiently perfect to solve the problem, but fortunately very clear evidence on this point is given by the Algerian mosaic picture mentioned above.

This shows a regular series of chimney-stacks, exactly like those we build now, rising above the roof, and each surmounted by a chimney-pot, or smoke-cowl, very clearly shown.

This shows us that the smoke, after passing up the walls in the various square flue-tiles, must have been collected in some horizontal or upward sloping channel, and so brought to a common exit in the chimney-stack.

As wood was the usual fuel, and what little soot there was would collect under the *suspensurae* of the hypocaust, there can have been no necessity for sweeping the wall-flues, a thing which must have been almost impossible.

In a few cases in Britain, as for example, in the villas near the Roman coal mines in the Forest of Dean, coal seems to have been sometimes used instead of wood to heat the hypocaust furnaces; in these cases it is probable that inconvenience was found to arise from the choking of the wall-flues.

In most places however in Britain (as in Italy) wood was the only fuel used by the Romans in their houses, and it was not till comparatively modern times that coal was used in the better class of houses.^a

II. *Peculiarities caused by different local materials.*—The main differences in the construction of Romano-British houses as compared with those in Italy arose from the absence of the *pozzolana* (*lapis Puteolanus*), which, when mixed with lime, made the strongest and hardest concrete and cements, of the highest durability, and with perfect hydraulic properties.

Having to use the ordinary sands and limes of Britain, which make a very inferior kind of concrete, the Romans built their walls of stone or brick throughout, not of concrete merely faced with bricks, as in Italy.^b

Thus, instead of triangular bricks, which were universally used in Rome, rectangular bricks were employed in Britain, and the wall was built of solid brickwork throughout, or else, more commonly, with two or three “lacing-courses” of brick at regular intervals in the height of stone walls.

When stone was used, either alone or with brick “lacing-courses,” the blocks were usually not very large, and only the external blocks were squared more or less accurately and finally dressed on their exposed face. The internal mass of the wall was of rubble, very inferior in strength and cohesive power to the concrete of Italy.

Finely dressed ashlar was rarely used, as in almost all cases the surface of the wall was covered with stucco.

The character of the stone masonry of the Romans in Britain varies very much in accordance with the nature of the local stone.

In very few cases has stone been brought from any distant quarry, the Roman rule being always to use as much as possible the local materials.

^a In the fourteenth century the evils of coal smoke were beginning to be felt, so that the citizens of London petitioned the king to prohibit the import of “sea-coal,” on the reasonable ground that its smoke sullied the purity of the snow-white houses of London.

A few years later an Italian, who visited England on an embassy to the Court, wrote down in his notes that some of the English were so poor that they used “black stones” instead of wood for fuel.

^b The Roman method of facing concrete walls with triangular bricks is described in *Archæologie*, Vol. LI. p. 41 *seq.*

Considering this, the uniformity of the character and design of Roman work, wherever it is found, is very remarkable, and shows wonderful skill in the adaptation of very different local materials to the special Roman notions of what was desirable in a building.

On account of the inferiority of the concrete made with British materials we find that vaulted ceilings are much less common here; *contignationes* or wooden floors being used where concrete vaults would have been used in Italy.

And, partly owing to the weakness of the Romano-British rubble walls, it was far more common in this country to construct the upper stories of wood, probably overhanging the ground floor, as we see still existing in a few cases at Pompeii. The construction of wooden storeys with framed timbers filled in with two layers of "wattle and dab," and then covered with stucco, is described by Vitruvius.^a The method employed was like that of many fifteenth-century timber houses in England.

These over-hanging timber storeys appear to have been called *maeniana*, the projecting joists on which the front wall rested were *contignationes pensiles*.

In Italy the roofs were usually covered with tiles of baked clay, or, in the more splendid palaces and temples, with slabs of white marble like those used by the Greeks, or with plates of bronze thickly gilded.

In south-west Britain the commonest form of roofing seems to have been slabs of the so-called "Stonesfield slate," cut in lozenge form and nailed with very large iron nails. The drawing of the Spoonley verandah gives the usual shape and arrangement of these stone slates.

This highly laminated limestone is found in a great many places in England.

One large quarry worked by the Romans was at Kinton Thorns in Gloucestershire, where long ranges of barrack-like stone sheds for the workmen have been found.

In some places in Britain clay tiles were used, like those in Italy, but they are comparatively rare.

The construction of hypocaust floors in Britain was modified on account of the inferior nature of the concrete of which the *suspensurae* were made. In Italy the pozzolana concrete was so strong that few *pilae* were needed to support the concrete floor, and, in some cases, the *pilae* were wholly omitted, the floor being then a solid slab of concrete, like a block of stone, supported only at its edges.

Again in Italy the *pilae* seem to have been always formed of baked brick, but in some parts of England, especially in Gloucestershire, bricks seem to have been

^a II. x. § 20.

costly, and are very sparingly used. Thus at Spoonley, and at the fine villa at Chedworth, in the same county, nearly all the *pilae* are made of stone, in spite of the local stone being a soft oolite which has no great power of resisting fire.

At Chedworth some of the *pilae* are square monolithic pillars, with a very rough cap and base worked out of the same block, but it was more usual to build up the *pilae* of several courses of roughly squared stone; large slabs of stone were then laid on the tops of the *pilae* to receive the thick bed of concrete which formed the *suspensurae*.

In some cases these stone *pilae* and the inside of the furnace and stoke-hole were lined with *opus signinum* to protect the stone from the fire, which otherwise might have burnt it into lime. This was the case at Spoonley, as is mentioned above.

Another British peculiarity was the heating of floors, not with *suspensurae* resting on *pilae*, but merely by horizontal flues, like drains, running under the floors. These were built of rough stone, and the number of flues in each room varied according to the amount of heating power that was desired.

In some cases only one flue crossed the room, in other cases the flues were so numerous that nearly as much heating surface was given as if a regular hypocaust had been made.

Another method occasionally used in Britain was to rest the concrete floor on rows of wall flue-tiles laid horizontally instead of vertically. The hot air from the furnace first passed under the floor along these flue-tiles, and then went upwards in similar flues set in their usual position against the face of the walls.

In a few cases, as, for example, at Bath, a very curious use was made of these flue-tiles, probably in places where they were specially abundant, that is, they were used as *voussoirs* for arches and vaults, for the sake of combined strength and lightness, just as concrete made of pumice-stone was used in the vaults of houses in Rome.

All the various ways of constructing hypocausts described above are shown in Plate XX.

Water supply.—In certain parts of Britain, especially in Shropshire and Somersetshire, the water supply to the houses and public baths was exceptionally complete.

In Italy lead was costly, as it had to be imported mostly from Britain or Spain, but in the neighbourhood of the rich lead mines in the Mendip hills and elsewhere lead was so cheap and plentiful that it was used in a much more lavish

HORIZONTAL FLUE-TILES

Scale of 1
2
3
4
5
6 feet

FOUR METHODS OF CONSTRUCTING HYPOCAUST FLOORS USED IN ROMANO-BRITISH VILLAS.

way than in Italy for supply-pipes, cisterns, and even for lining large baths.^a One of the large public baths at Bath offers a most remarkable example of this; it was wholly lined with great plates of lead, 10 feet long by 5 feet wide and about half an inch thick.^b

The lead supply-pipes were larger and of thicker lead than is usual in Italy, and more of them were used.

Some British examples are as much as 14 inches in diameter, in these cases the pipe is rectangular in section, made of two plates of thick lead, one forming the bottom and sides of the pipe, while the other is a flat plate soldered across to form the top or lid of the large box-like pipe.

In most cases however the pipes are formed, like those in Italy, by bending a sheet of lead 10 feet long round a circular wooden core, which allowed the sheet to be hammered into circular or rather oval shape. The edges were then brought together and securely soldered.^c

In British towns, as in Italy, large lead mains were laid under the paving of the streets, and rising mains branched off right and left to the houses, leading up to cisterns on the upper floors, from whence descending supply-pipes were laid on to various parts of the house, exactly like the modern system. Air-chambers were often introduced to diminish the risk of pipes bursting from the hydraulic pressure, the confined air acting as a spring.

A cubical lead box was usually placed at the point where the rising main to the house branched off from the main in the street; this seems rather a clumsy way of making a junction, but it apparently answered its purpose very well.

Very neatly made water-cocks and draw-taps of bronze were used, the *epistomiae adplumbatae* of Frontinus; the turn-cocks in the mains had moveable key-handles like those now in use. In the public baths at Bath the largest water channel, which was cut in stone, had a sliding bronze sluice-door working in a grooved bronze frame fixed in its place with lead; this regulated or wholly shut off the supply.

The draw-taps were very like those used in Italy, often formed in the shape of an animal's head, with handles either fixed or more often moveable; they are frequently very graceful in form, and are always very skilfully made and fitted so as to avoid leakage.

^a In Italy pipes of clay or even of stone were frequently used for the water supply: Vitruvius calls these *tubuli*, and uses the word *fistulae* for lead pipes; see Vitr. VIII. vi.

^b The whole of this lining was stripped off and sold by the Corporation of Bath for old lead; a quite inexcusable act of vandalism.

^c See Vitruvius, VIII. vi. § 4.

Methods of decoration used in Britain were as much like those in Italy as the nature of the local materials would allow.

Almost the only sign of provincial influence is the general low standard of the Roman sculpture in Britain, and the peculiarities of the British mouldings, which are frequently very unlike those used in Italy.

The mouldings of the Spoonley verandah columns are a good example of this (see Plate XIX.), they are more varied and more delicate in execution than those of Italian houses.^a

This is not however always the case with Romano-British mouldings; they are often very coarse and heavy; especially during the third and fourth centuries.

Stucco reliefs and mural paintings in Britain are very like those in Rome, and the general design of the mosaic pavements is closely similar in all Roman houses, whether the house is built in Britain, Gaul, Greece, Africa, Spain, or Italy.

The only difference is the use of British stone and burnt brick, instead of marble for the *tesserae*.^b

In a few places imported marble has been found in Britain, both in solid blocks and in thin slices (*crustae*) for floors or wall linings, but this is quite exceptional; as a rule only local materials occur, especially in the private houses of the Romans.

The chief cases where marble has been found were in the "Basilica" at Silchester, which was, in part at least, lined with veneers of white Luna marble, and in some of the temples in the south of Britain, where solid blocks were used.

It seems strange that the richly coloured serpentines of Cornwall, and the alabaster of Derbyshire, were so little used by the Romans, who were usually keen to discover any new decorative material.

I have seen what was apparently Cornish serpentine among the ruins of the Flavian palace on the Palatine hill, but I know no example of its use in a Romano-British building.

A great deal more might be said about the construction and arrangement of Romano-British houses, but I believe the above brief notes give the main differences between the houses of the Romans in Britain and in Italy.

^a There is a special interest in these Romano-British mouldings owing to their great likeness to many of the mouldings used in England by the Norman builders of the eleventh and twelfth centuries. A direct classical influence is clearly to be seen in many of these.

^b See above the materials of which the Spoonley mosaics are made.