

Roman Dock and Buildings

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I. INTRODUCTION.

The Romano-British site at Heronbridge lies astride Watling Street on the west bank of the River Dee, almost 2 miles south of Chester Cross. This report¹ is concerned primarily with work carried out in 1953, which was made possible by generous grants from this Society and the Administrators of the Haverfield Trust. Grateful thanks are also expressed to the Chief Agent of the Duke of Westminster's Eaton Estates and to the Ancient Monuments Department of the Ministry of Works for permission to excavate, to Mr. P. M. Hunt of the Estate Office for arranging the provision and erection of fencing, and not least to Mr. Hugh Frost, J.P., for kindly allowing the use of his stables for storing equipment.²

The work undertaken in 1953 consisted mainly of a section across what appears to be a Roman dock. Some notes are also included here on work carried out by Mr. W. J. Williams and others in earlier years, on adjacent buildings. The part of the site to be described lies on the east side of Eaton Road, immediately south of the buildings known as Site I. (Site Plan, fig. 4).

II. (a) PERIOD I.

The area dealt with in this report everywhere yielded evidence of occupation from about A.D.90-130, in the form of occupation debris, pottery, tile, charcoal, etc., but a few structures were also identified. Although no one of these has been completely uncovered, an attempt can be made at an estimate of their character.

¹For accounts of previous excavations see: *C.A.J.*, 30, pts. 1 and 2; 39, 1ff.

²Apart from the writers, the permanent staff of the dig consisted of Messrs. Alan Wilkins, A. M. Jenkins and P. Salway, whose excellent work under the most trying circumstances cannot be allowed to go unrecorded. In particular, Messrs. Wilkin and Jenkins took charge of the photography and the latter, with characteristic generosity, provided a set of colour slides for the writers' use. Thanks are due to Messrs. Graham Webster, A. St. G. Walsh, D. Petch, P. Wild, P. Hayes and D. W. G. Hooper, also to the City Engineer, who kindly provided a pump, and to his foreman, Mr. F. Davies, who set it up. This was made necessary by the unkindness of the weather which contributed a cloud-burst and several days' rain, thus seriously hampering excavation.

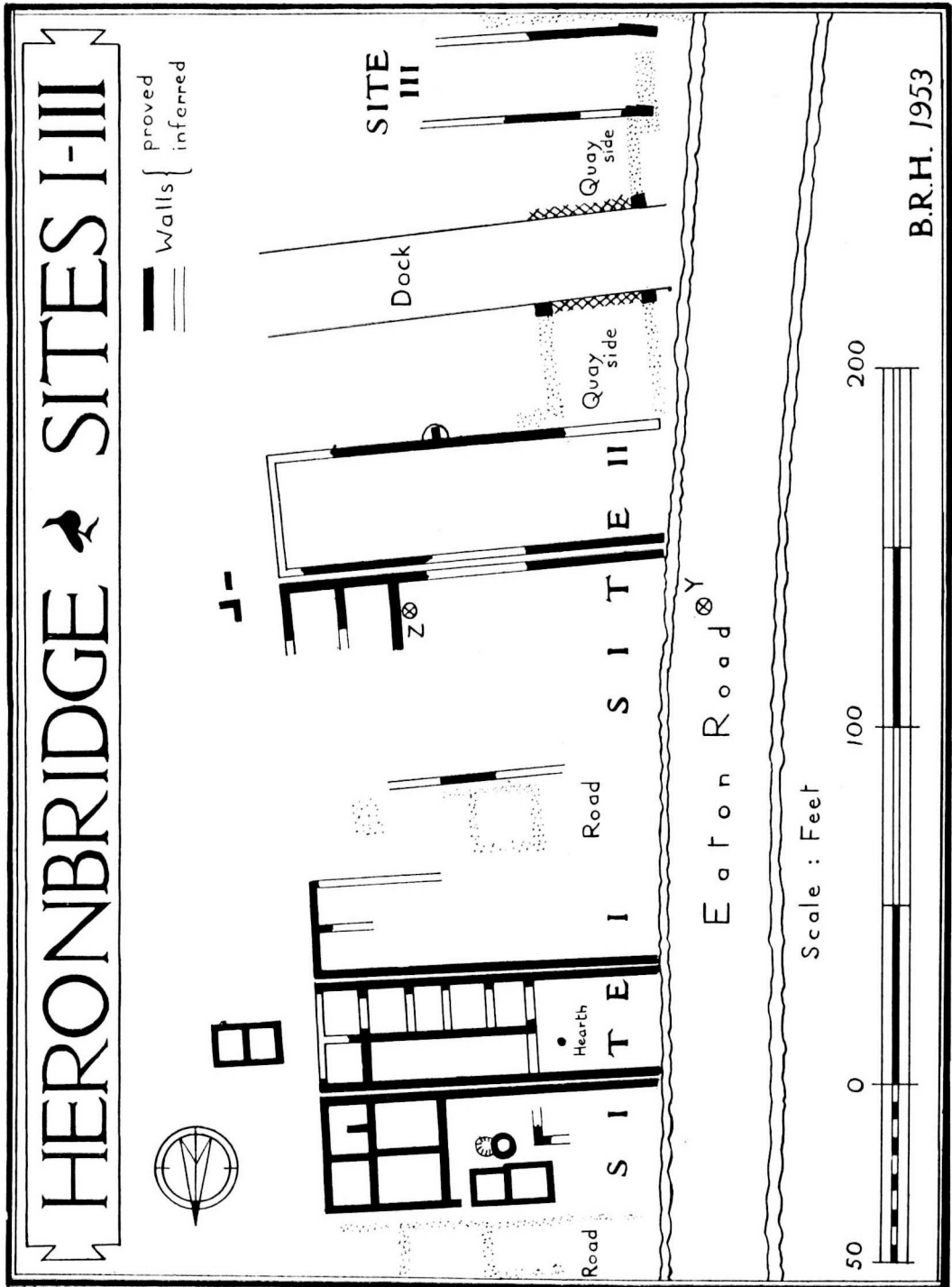


FIG. 4. Site Plan.

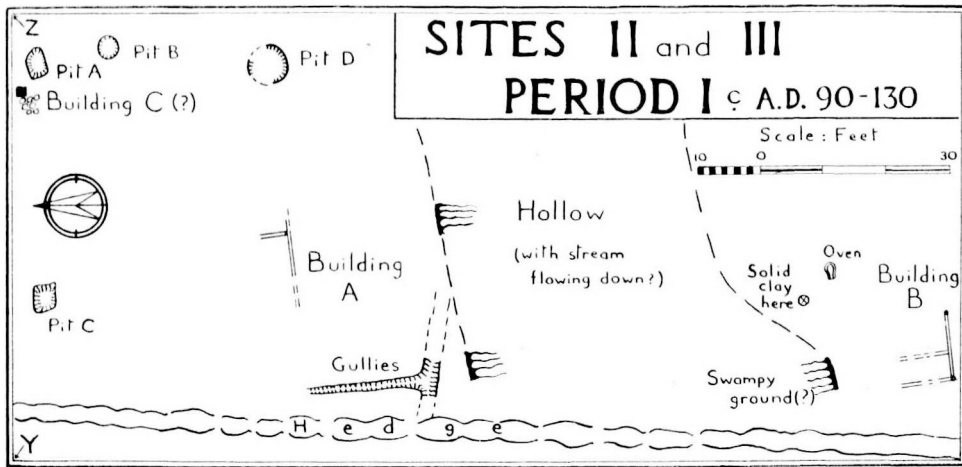


FIG. 5. Period structures.

On Site I part of a timber-built workshop associated with a bronze-worker's hearth was found underneath a stone building of the following period. (p. 1). The presence of similar remains of timber structures on Sites II and III now entitles us to suppose that this was the normal method of construction during Period I.

One of these buildings (Building A of Site II, figs. 5, 6) had some unusually interesting features. On the south side in place of a sleeper-beam trench of normal pattern was a trench 9 inches wide and 10 inches deep in which were embedded upright slabs of roughly dressed sandstone. They were packed in with smaller stones and clay and had flat tops. The most likely explanation of this treatment is that the slabs formed a narrow sleeper-wall on which horizontal beams were bedded. Into the beams uprights could then be morticed in the usual way (fig. 6). This curious method of construction may be explained by the dampness caused by the boulder clay subsoil. This would also account for the absence of floors which having been at the level of the timber sill would have been ploughed away. Inside the building, at right-angles to the south wall and ending a few inches short of it, was a beam trench which passed under a Period II wall to the north. When cleared this trench was found to contain no stone, though it is not impossible that the later builders had removed original slabs for incorporation in their walls. On the other hand, a sleeper foundation designed to avoid dampness was not necessary here as it is an internal partition. That the frame-work of the building was covered by weather-boarding is suggested by the complete absence of daub.

Slight traces of another building of the first period were also recognised on Site II (Building C, fig. 6). This also was of an unusual character and apparently had stone-built piers to support its roof timbers in the same manner as the bronze-smith's workshop of Site I (p. 4).

The only timber building found on Site III (Building B, fig. 5), was of different character. In this case no stone was used in the structure. A sleeper-beam trench

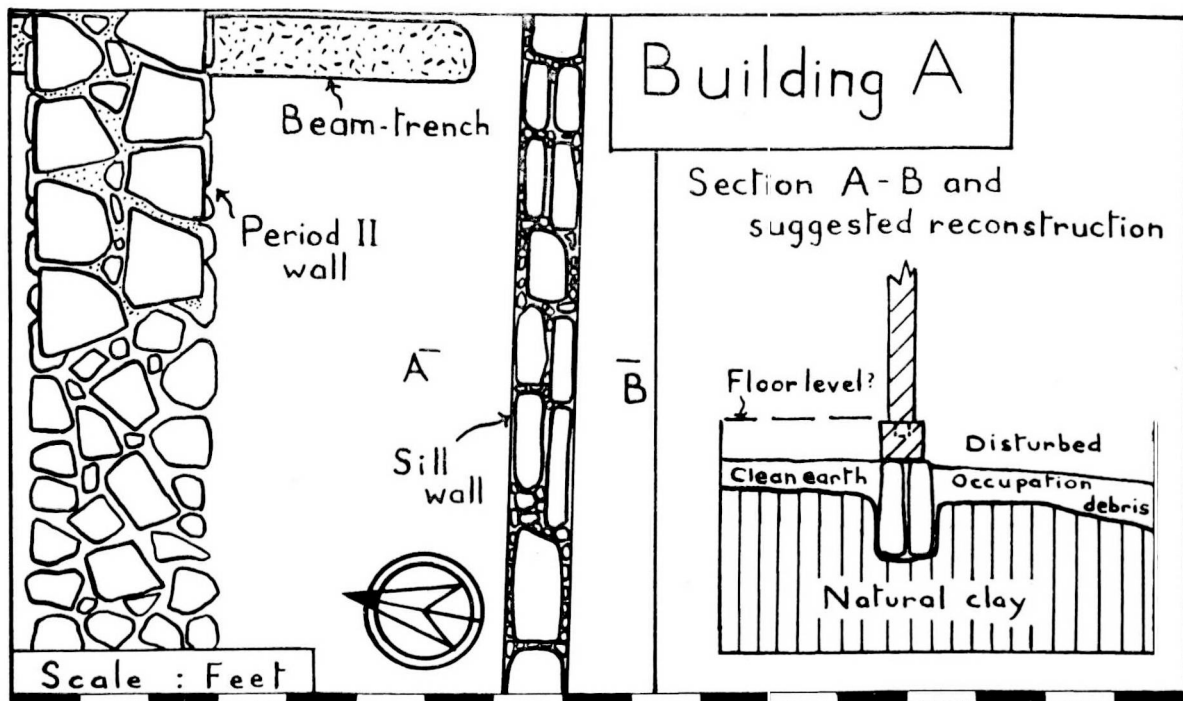


FIG. 6. First period building on Site II.

6 inches wide was traced for thirteen feet and had two returns to the north, one forming the south-west corner of the building. At this corner and again twelve feet to the east were post-holes for wooden uprights; a fact suggestive of repair or reconstruction of the building as one was dug through the beam-trench. The nature of the superstructure is clear from the profusion of daub with wattle impressions and some sheet-glass. Nearby, at the footings-level of a later wall, was a small oven of domestic type (fig. 8) presumed to be of this period.

On Site II four pits belonging to the first period were cleared (Pits A-D, fig. 5) Of these, two were circular, two subrectangular, all being cut about 18-24 inches into the natural clay. The fillings were composed of dark earth with occupation material and, except for Pit D, metallic slags. No indication of their original purpose was found. The pottery from the fillings was all of late-first or early-second century date, the latest piece being a fragment of figured Samian in the style of IVLIVS VIBIVS (c. A.D. 115-130).

A feature of the site in this first period was a wide natural hollow (fig. 7) which separated Sites II and III and continued to the east as far as the river. This must have been the bed of a stream flowing into the Dee and it was used as a convenient means of draining the area to the north where small gullies or drainage-channels were cut in the natural clay. One of these, 20 feet long, was completely cleared (Plate 1). It began as a slight u-shaped groove but gradually increased in size

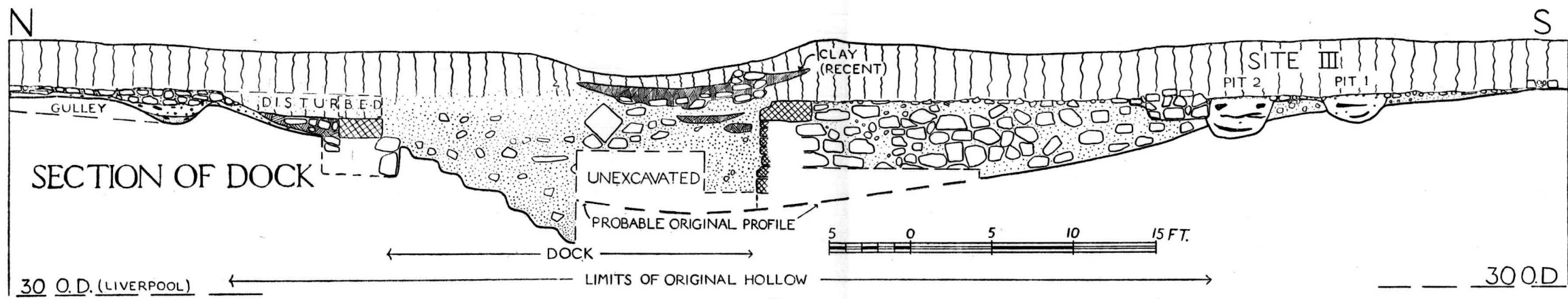


Fig. 7.

to 30 inches wide and 18 inches deep. This channel, which was aligned north-south, ran into another running roughly east-west, which apparently drained into the hollow a few feet east of our section. Each channel had several inches of fairly clean rapid silt in the bottom so it is likely that they were uncovered. At the beginning of Period II they were filled up with occupation material derived from first period deposits, including much pottery, ash, slag and fragments of lead.

The new material of Period I from Site II adds confirmation of the importance of metal-working at Heronbridge, for considerable quantities of slag and ash were found, although no new hearths were uncovered. As on Site I, the Samian ware points to an initial occupation beginning about A.D. 90, and the new evidence shows that on this part of the site the first period lasted until *c.* A.D. 130-140, whereas on Site I little, if any, of the Samian could be placed later than *c.* A.D. 110.

II (b) THE DOCK.

It has already been stated that in the initial occupation a hollow, presumably the valley of a stream, existed between Sites II and III (plan, fig. 5). The surface indications show that the hollow continued towards the river, where the junction with an old river bank may still be seen (Plate I). While the original profile of the hollow cannot be recovered with certainty, as it has been much altered by later construction, a suggested restoration is given in the Section (fig. 7). We may further suppose that a stream flowed in a u- or v-shaped bed in the bottom. It was decided to use the natural hollow for the building, probably in the decade A.D. 130-140, of a composite structure, here interpreted as a dock.³ This account is limited to a description of the one section of the dock so far made and to a detailed description of the evidence for its date.

The main section across the dock (fig. 7) shows that its builders filled in the south part of the old hollow with a massive platform of rough-hewn sandstone blocks. Of one built with the platform was a wall of squared stones (Plate I) which formed the south side of the dock. Unfortunately, as it did not prove possible to follow this down to the natural clay inside the dock, the details of this south side must remain uncertain. It does, however, seem clear that the sandstone platform was intended to serve as a quayside providing easy access to the dock.

The north side of the dock coincided more nearly with the limits of the former hollow and so a platform was not necessary. Instead, a foundation trench four feet wide was cut a little in advance of the lip of the hollow and filled with sandstone rubble. This then served as the basis for a wall, 3 feet wide, of large dressed blocks. At the point investigated, only one course of the wall survived, but a comparison of the level with that of the south wall of the dock shows that at least one more course, originally existed. This has subsequently been removed, presumably by stone-robbers. Behind the wall was a solid backing of clay and large stones which ex-

³This interpretation while seeming to be the most likely must be considered to be hypothetical until further excavation, now being arranged, is carried out and other possibilities such as a canal or reservoir must not be overlooked. The important implication of the discovery must be held over until the interpretation is proved.

tended as far as the lip of the old hollow, thus effectively sealing rubbish thrown into it in the first period. The upper part of the backing had also been disturbed.

North of the dock wall the ground had been levelled by filling in the first period drainage channels with rubbish. A layer of sandstone rubble stretching for thirty feet to the north was then put down. This layer, equivalent to the sandstone platform on the south side, was also presumably put down as an approach to the dock. As the Section (fig. 7) shows, the relation between the dock wall and sandstone layer had been destroyed by interference, but there can be no doubt that they are contemporary and that the sandstone layer originally continued through to the edge of the dock.

The dock itself was 23 feet wide between walls and a basin had been made by excavating into the sides and, probably, the floor of the natural hollow, by cutting a series of steps in the natural clay parallel to the dock sides. The northern half was completely cleared and had a series of six steps with treads averaging 18 inches and risers varying from 9-12 inches. The maximum depth, which presumably coincided with the mid-line, was almost 9 feet to the top of the walls. It is not certain if the south half of the dock had similar steps, but, if so, they were fewer in number as the old hollow was deeper here and the floor of the dock was certainly asymmetrical. The presence of the stepped side in our section raises various points which may be briefly mentioned. It is not yet known whether the steps are continuous or whether they are merely a local feature. If the latter is the case, they may be connected with the west end of the dock which cannot have been far from the point investigated, unless indeed it continued to the west beyond Watling Street which is unlikely.⁴ The relation of the dock to the river and the method of filling it are matters requiring future attention. But it may be said at once that the relative levels must have demanded the provision of locks.⁵

The dock was filled with silt containing an admixture of sandstone fragments and, towards the top, a few small wedges of clay. No evidence of deliberate filling was to be seen in the Roman levels, though in the plough soil was a wedge of clay and stone containing modern pottery which is suggestive of an attempt to level the field in recent times. It is not possible to determine the date by which the silting of the dock was complete. The few fragments of pottery found all appeared to be of third century date. The only piece which can be illustrated is a hammer-head mortarium (no. 82) which was found 4 feet down from the top of the dock wall. This, together with the fact that third century pottery has not been found in the buildings to the north, seems to suggest that the dock had ceased to function by the beginning of the third century after which it was allowed to silt up.

⁴That the steps may be local is suggested by a sounding cut 25 feet east of the main section where the north wall of the dock was traced downwards for seven feet without any signs of a stepped side. The discovery of considerable quantities of heavily carbonated scraps of sheet lead here may indicate the presence originally of some form of lead sheathing to protect the clay steps.

⁵The river level at Heronbridge in Roman times may have been some five feet higher at high tide than it is at present. The Dee would, of course, be tidal at Heronbridge before the building of the Chester weir. If this point is conceded, the difference between river level and the level of the water in the dock would be about 20 feet and so, as suggested by the profile kindly prepared by Mr. Graham Webster, an allowance should be made for two locks, each giving a rise of ten feet.

DATE OF CONSTRUCTION.

The occupation material sealed by the sandstone layer to the north, by the clay backing of the north wall, and by the platform south of the dock, is discussed in detail below (p. 25 ff). The bulk of this material is Samian ware of Domitianic-Trajanic type and coarse pottery of similar date. There are, however, several sherds of Central Gaulish Samian with Hadrianic styles of decoration and also some pieces in the black burnished 'cooking pot fabric' first introduced in the military areas of Britain about A.D. 125. Though detailed examination of these fragments shows that none is necessarily later than *c.* A.D. 125-130, it is to be expected that some of these sherds will in fact be slightly later than this, the earliest possible date for them. Accordingly, a date of *c.* A.D. 130-140 is proposed for the construction of the dock, which is now seen to be contemporary with the large strip buildings to the north.⁶ It cannot be doubted that dock and buildings go together as part of the same system.

General confirmation of the date set forward for the dock is given by the pottery from pits cut into, and so later than, the sandstone platform south of the dock which, it will be recalled, is of one build with the dock wall. This pottery (nos. 26, 27, 76-81) is of Antonine date.

II (b) BUILDINGS NORTH OF THE DOCK. (Sites I and II, fig. 4).

The three large strip buildings of Site I have already been published in some detail⁷. The stone buildings of Site II are of the same type, although the details of their planning are known only in outline. A detailed description of the excavations carried out there by Mr. W. J. Williams will not be attempted, but it is felt that some notes are called for in order to complete the picture of the Heronbridge site as a whole.

Site II measures 98 feet from north to south, compared with 93 feet for Site I, so there is room for three buildings here, too. The central and southern ones are divided by a narrow eaves-drip in the same manner as those of Site I, and presumably the northern and central buildings are similarly related (Plan, fig. 4). The south building averages 38 feet in overall width, but the main walls are not quite parallel. The other two buildings together measure 60 feet over the outside walls. As on Site I, the west ends of the buildings are inaccessible below the hedge-row, but the central one was at least 115 feet long, and as the modern road is probably coincident with Watling Street here, this must be almost its full length.

In design the buildings closely resemble those of Site I, both in their general proportions and also in having no internal divisions in the front part. The central building was certainly divided into rooms at the east end, and the others would presumably be similarly treated. The walls are 2 feet 6 inches thick with a facing of small squared sandstone blocks to a rubble and mortar core. It is perhaps likely

⁶*C.A.J.*, 39, p. 13.

⁷*C.A.J.*, 39, pp. 1 ff.

that half-timbering was used. Micaceous slabs from the Bunter beds were used for roofing. No floors survived in the areas trenched and they have presumably been ploughed away.

The pottery found in deposits below these buildings gives a *terminus post quem* of c. A.D. 130 and it is probable that they are part of the same scheme as the three buildings of Site I and the dock. Much of the pottery from the site was in the topsoil suggesting an occupation lasting well into the Antonine period but not into the third century. The latest vessels were early Castor types (first introduced c. A.D. 170-180).

II (d) SITE III. (fig. 8).

The first period occupation of Site III has already been dealt with (p. 17). In the later phases there are three distinct periods shown by the stone buildings. These do not necessarily bear relation to the periods determined for Sites I and II and in the almost complete absence of floors and stratified pottery it is difficult to correlate them with the rest of the occupation of Heronbridge. The buildings here were of a less substantial nature than those of Sites I and II and seem closer in character to those uncovered by Mr. J. A. Petch further south in the same field⁸.

SECOND PERIOD

The only structures assignable to this phase are the footings of a single east-west wall, 22 inches wide and over 26 feet long and a sandstone roadway to the south. Both override Building B of Period I and, as the pottery from the wall footings and from below the road is all of late-first or early-second century date, they should probably be assigned to the Hadrianic phase of construction. No floors survived. It is difficult to make sense of an isolated wall of the kind described, but it is not unlike the 'long wall' found by Mr. J. A. Petch⁹. Furthermore, Mr. W. J. Williams has uncovered similar single walls, apparently alternating with roadways, between Site III and the area dug by Mr. Petch. A possible explanation of these features is that the walls served to support open lean-to sheds, but no associated postholes were found in the area uncovered. It is probable that Pits 1 and 2 (Plan, fig. 8; Section, fig. 7) were dug at this time for they cannot have been open in the succeeding phase when they would have blocked access to the building then occupying the site. The pottery in the pits may be dated c. A.D. 150-170. They also contained much charcoal and burnt daub.

THIRD PERIOD

In this phase a strip-building 24 feet wide, was put up on the site. This was traced for 36 feet to the east, but its total length would probably be about 80 feet if it had the usual proportions of its type. The walls, 2 feet wide, were of stone set in clay. They were not quite parallel and ended at the west in large blocks which must

⁸*C.A.J.*, xxx, p. 1 ff.

⁹*C.A.J.*, xxx, p. 9.

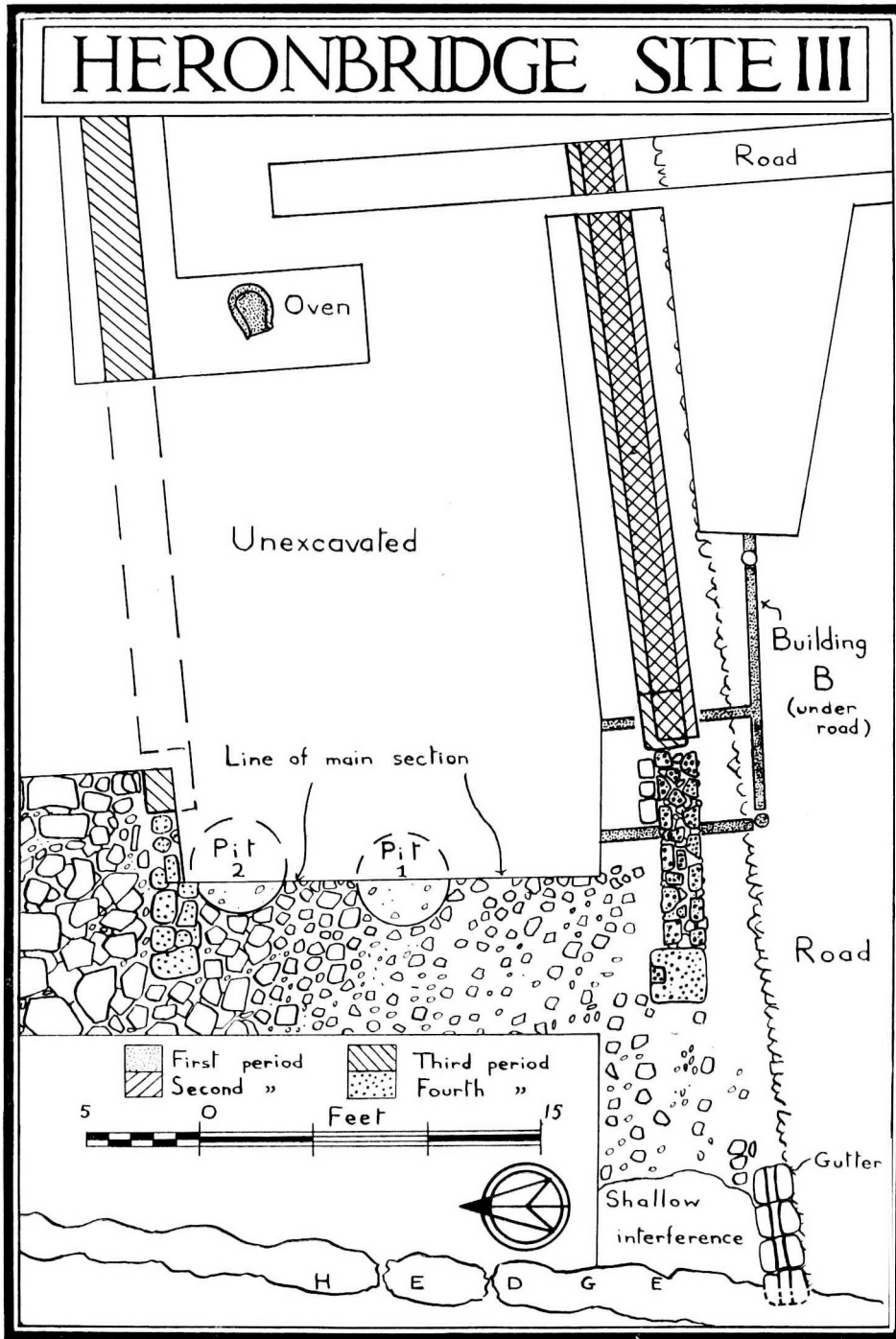


FIG. 8.

have served as foundations for posts carrying double doors. No floors survived and no internal divisions existed in the front part of the building. The south wall was provided with a stone gutter which has subsequently been removed, except for four stones in front of the building, leaving only a shallow trough in the natural clay.

The wall north of the building overlaps the stone platform of the dock and is, therefore, constructionally later. The relation between these structures (Plate 1 b) suggests that the stones of the platform have been disturbed in order to bed the large end-block of the wall horizontally, and this in its turn probably indicates that the wall belongs to a different building scheme. The pottery from Pits 1 and 2 is later than A.D. 150 and these pits are certainly earlier than the building which must then belong to the late-second or, possibly, the early-third century.

FOURTH PERIOD

At an undetermined date, presumably in the third century, the strip-building of the third period was extended to the west. The extending walls were very roughly built and were differently aligned from the main building. That on the south side was 11 feet long, that on the north, preserved only as footings, 7 feet 6 inches long. The south wall ended in a large block comparable to those of the third period, but in this case a socket, 9 inches square and 4 inches deep, was cut in the stone at its north edge. This clearly was intended to take the door post, and there was probably another block with corresponding socket at the west end of the north wall. No stratified material was associated with this phase but the topsoil produced much pottery of third century date.

II (e) SUMMARY

Sites I-III have now yielded considerable evidence for the history of the Romano-British occupation of Heronbridge. About A.D. 90 these parts of the site were first occupied by buildings of timber or timber and stone construction. At this stage the occupation seems to have been industrial and concerned with metal-working. In the last decade of the first century occupation was intense but, judging by the decreased quantities of pottery reaching the site, the density of population dropped during the first thirty years of the second century.

About A.D. 130-140 the character of the site changed completely. A construction scheme was carried out embracing the provision of what appears to be a dock flanked by quay-sides and of at least six large buildings to the north, which were probably store-houses. There is no evidence of metal-working in this phase. The system was still in use in the late-second century but it seems probable that both dock and buildings were derelict by the third century, although other parts of the Heronbridge site were occupied then. South of the dock the occupation took a different course. There, we have some suggestion of isolated walls supporting lean-to sheds in the A.D. 130-140 period, and of two subsequent periods of construction presumably in the late-second or third century.

III. FINDS

- (a) STAMPED AND DECORATED SAMIAN (Fig. 9).
- (b) PLAIN SAMIAN AND COARSE POTTERY (Figs. 10, 11).
- (c) SMALL OBJECTS (Fig. 12).
- (d) GLASS.
- (e) COINS.
- (f) SLAGS *etc.*

The pottery found below the stone pitching flanking the dock and in deposits formed during its construction is described in considerable detail. This is thought desirable at the present stage, as future work will be confined largely to elucidation of details of the dock, a process which is unlikely to add much to the dating evidence already available.

All the decorated Samian found is illustrated, but only a selection of the more interesting plain forms is given. In the case of the coarse pottery a representative selection of the Flavian-Trajanic types is given, but the Hadrianic-Antonine pieces are all drawn, as these have a more immediate bearing on the date of the dock.¹⁰

III (a) STAMPED AND DECORATED SAMIAN WARE.

1-25 are from pre-Dock deposits.

1. Stamp of DAGOMARVS on form 18/31. The shape of the dish is very close to no. 34, though the central kick is slightly lower. The distribution of his stamps suggests that DAGOMARVS worked in Central Gaul, while the presence of one at Newstead (*Newstead*, p 235, 39) shows that he was exporting his wares by about A.D. 100.
2. Fragmentary stamp]MARVS on form 18/31. This is from the die as no. 1. The form, fabric and glaze of the dish are also the same.
3. Stamp of INDERCILLVS on form 33. The cup has a slight basal kick and a marked offset at the internal junction of base and wall, both features are characteristic of Flavian-Trajanic cups. The stamp is identical with one from Brecon (*T Cymrodor*, xxxvii, 235). The distribution of his stamps suggests that INDERCILLVS was a Central Gaulish potter; Oswald (*Stamps on Terra Sigillata*) assigns him to the 'Trajan-Hadrian' period, but dating evidence is scanty. Judging by typology, the present piece is unlikely to be later than *c.* A.D. 115.
4. Stamp OFI[]LV[on a flake, probably form 18 or 18/31. The fabric is South Gaulish. No certain attribution of this stamp can be made, though LVCCIVS of La Graufesenque is a likely candidate (Hermet, *La Graufesenque*, Pl. III, 82). As the South Gaulish potteries ceased to export Samian about A.D. 100, this scrap is certainly of first century date.
5. Form 37, South Gaulish. The ovolo with tridentate tongue is a common feature of late South Gaulish bowls. The decoration is in panels divided by wavy lines, which retain some measure of the crispness characteristic of Vespasianic ware. Date: *c.* A.D. 85-100.
6. Form 37, South Gaulish. The use of zonal decoration on form 37 was due in the first place to the influence of form 29. Vespasianic bowls often have a series of four or more zones (*cf.* *J.R.S.*, iv, Pl. vii), but by A.D. 85 the type of decoration exemplified by this piece had become common. Here there are two zones, the upper a 'hunting' scene with animals and conventional vegetation (*cf.* no. 12), the lower a series of festoons with rather crude pendants. A thick ridge, which is in fact a degenerate wavy-line, divides the zones.

The use of the general style of hunting scene and zone of festoons may be traced back to the Vespasianic potter GERMANVS (*Knorr* 1953, Taf. 28E), whose work often shows originality and even artistic merit, but the cruder version of the style represented here is typical of the later potter BIRAGILLVS to whom this piece may be attributed. Date: *c.* A.D. 85-100.

¹⁰Mr. J. P. Gillam has kindly examined these latter pieces and is in agreement with the opinions of their date stated above (p. 21).

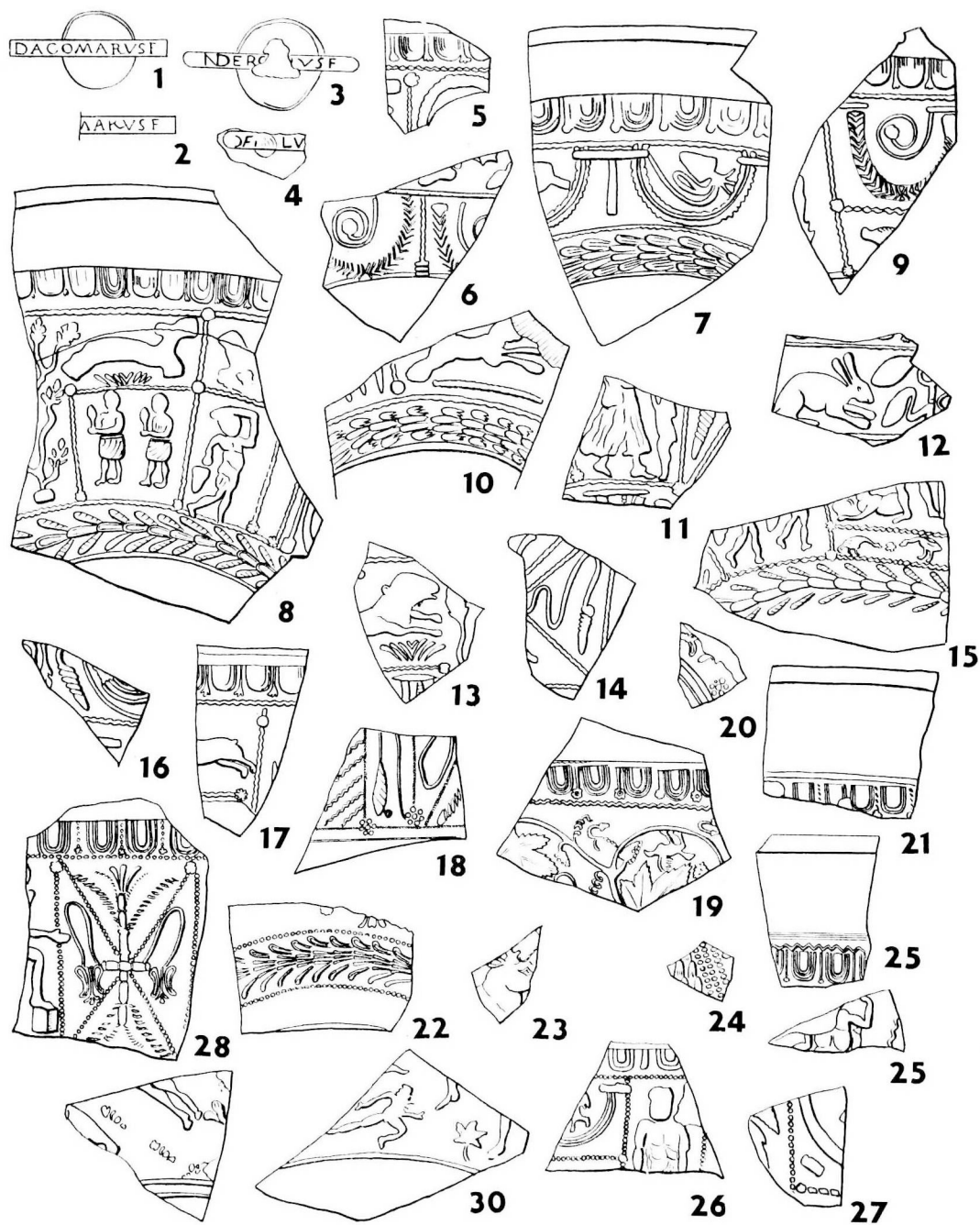


FIG. 9. Potters' stamps and figured Samian (nos. 1-4 (full size); remainder (half size)).

7. Form 37, South Gaulish. This piece is an excellent example of the degeneration of the more formal zonal style used by the majority of Vespasianic potters. Again the number of zones is reduced to two, the upper has a series of festoons enclosing the so-called 'stirrup-leaf,' while the lower zone is merely a straight wreath. The squat ovolo with knobbed tongue is one used by L. COSIVS (*Knorr* 1919, Taf. 25) and the wreath is also found in his work. Date: c. A.D. 85-100.
8. Form 37, South Gaulish. A typical example of late-first century panel decoration, as a whole the style is characterised by extreme division of the decoration by blurred wavy lines, and by the use of a restricted range of figure types common to many potters. The types on this bowl, stag (*Déch.* 859), man with torch (*Déch.* 577), and Satyr (*Déch.* 323) are all very common. The basal wreath was used especially by MERCATO (*Knorr* 1919, Taf. 57), to whom this piece is probably to be attributed. Date: c. A.D. 85-100.
9. Form 37, South Gaulish. This piece is in the same general style as no. 8 and of similar date.
10. Form 37, South Gaulish. Though also decorated in panels this bowl is in a different style from nos. 8 and 9. The panels are larger and have fewer subdivisions. The style is reminiscent of the work of L. COSIVS and the glaze, which is yellowish, is similar to that of no. 7. Date: c. A.D. 85-100.
11. Form 37, South Gaulish. An example of combined zonal and panelled decoration, the upper, panelled zone, includes a Diana (*Osw.* 104b) and part of a St. Andrew's cross similar to ones used by MERCATO and M. CRESTIO (*Knorr* 1953, Taf. 19A, D.). The lower zone has a series of festoons as on no. 6. Date: c. A.D. 80-100.
12. Form 37, South Gaulish. This fragment has part of a zone of animals and foliage of the type referred to under no. 6 (*cf.* *Knorr* 1953, Taf. 6c by BIRAGILLVS). The tridentate tongue of the ovolo is just visible. Date: c. A.D. 85-100.
13. Form 37, South Gaulish. Zonal decoration as on nos. 6 and 12. The use of small conventional grass-tufts is a sure indication of Domitianic-Trajanic date. The figure-type is a panther (*Déch.* 789). Date: c. A.D. 85-100.
14. Form 37, South Gaulish. Part of a bowl with panel decoration. The St. Andrew's cross is similar to that on no. 11. Date: c. A.D. 85-100.
15. Form 37, South Gaulish. A fragment of a panelled bowl in the same style as no. 8. The types are, satyrs (*Déch.* 323), geese (*Osw.* 2214, 2286). Date: c. A.D. 85-100.
16. Form 37, South Gaulish. This is probably part of a bowl with zoned decoration, a continuous scroll filling one frieze. The type of scroll represented (*cf.* Oswald, *Margidunum Samian*, xxiv, 12) is not common on the latest products of South Gaul, though the cable-like wavy line suggests that this is indeed such. Date: c. A.D. 80-95.
17. Form 37, South Gaulish. Panel decoration, ovolo with trident-tongue, fair wavy lines, high glaze. Date: c. A.D. 80-95.
18. Form 30, Central Gaulish. The decoration is divided by rows of very fine beads into panels; (i) has five diagonal wavy lines (ii) is a narrow panel with tassel and bud (iii) has part of a St. Andrew's cross. Seven-beaded rosettes are used to mask the bead-row junctions and the decoration is closed by a bead-row below. The fine beads occur especially in the work of IOENALIS and an unpublished piece in his style at Cambridge has similar tassels and buds in narrow panels. Date: c. A.D. 100-120.
19. Form 37, Central Gaulish. The ovolo has a tongue with well-formed rosette terminal and is divided from the main decoration by a bold wavy line. The decoration consists of a continuous scroll produced by repeated use of two separate stamps portraying naturalistic vine-scrolls containing a single large leaf, bunches of grapes and a bird. The two stamps are mirror-images of each other. This style of decoration is not uncommon in early-second century deposits. The individual type-stamps have long histories, being used by IVLIVS VIBIVS, IANVARIS, ARCANVS, eno of the SACER group, DRVSVS, CRICIRO and, in degenerate form, by later potters. The ovolo was used by

members of the SACER group in their early work (e.g. ATTIANVS, *cf. Ant. J.*, vii, 171, 13) and commonly by DONNAVCVS. The attribution of this style of decoration is, perhaps, best left open at present, though DONNAVCVS and the SACER group were probably responsible for some of these bowls at least. Other examples have been found in the Birdswald Alley (*C.W.*, xxx, 179) and at Regis House in the burnt deposit resulting from a fire in Roman London A.D. 120-130. (*Ant. J.*, xxv, p. 71, 35). Date: *c.* A.D. 115-130.

20. Form 37, East Gaulish. This fragment can be attributed to La Madeleine. The seven-beaded rosette with a small bead in the outer circle is common on the work of ALBILLVS (*cf. Saalburg Jahrbuch*, viii, 137 ff.), while the dull glaze and brick-red paste seem typical of La Madeleine ware. The scheme of decoration was probably a continuous scroll formed by use of a festoon stamp alternately the right way up and then upside down (*cf. Y Cymyrodor*, xxxvii, 3, 93 and *Trans. Leicester Arch. Soc.*, xxix, p. 13, 2).

Oswald and Pryce dated the activity of La Madeleine to *c.* A.D. 95-135, but this is open to doubt as Mr. Eric Birley has shown (*Arch. Aeliana*, xxv, p. 57) for La Madeleine ware appears in Antonine levels at Corbridge. On general and typological grounds a date nearer A.D. 120 would seem likely for the initial activity of the centre. Wares by ALBILLVS occur in the ditches of the earth-fort at Saalburg (*Saal. Jahrb.*, *loc. cit.*) and it is probable therefore that he was one of the early potters. Date: *c.* A.D. 125-140.

21. Form 37, Central Gaulish. Part of the ovolo alone survives, but this is characteristic of the 'Anchor' potter especially; the texture and workmanship is that usually found in his work. In assigning a date to his activity account must be taken of a piece with one of his aberrant ovolos found in an early pit at Newstead (Curle, *Newstead*, p. 213, 6) and of the absence of his work on the Wall. Date: *c.* A.D. 100-120.
22. Form 37, Central Gaulish. Part of a large bowl with basal straight-wreath enclosed between rows of medium-sized beads. At first sight the wreath looks like one used by GERMANVS who was also one of the few South Gaulish potters to use bead-rows on form 37. But the fabric is Central Gaulish and in fact the wreath was used in Central Gaul, as a piece from Chester (*C.A.J.*, xxxiii, Pl. xvii, 21) shows. A closing straight-wreath, bead-row or wavy line is an almost certain indication of pre-Antonine date on Lezoux ware, and the present piece is clearly Trajanic-Hadrianic. No certain attribution can be made, but the glaze and fabric are identical with those of no. 28, so perhaps it is a product of the SACER group. Date: *c.* A.D. 110-135.
23. Form 37, Central Gaulish. Two fragments of a bowl in the style of IVLIVS VIBIVS or VIBINVS with his characteristic zig-zag lines and ovolo. The ovolo tongue ends in an ovolo bead and close examination reveals another minute bead above this, a feature the writer has noted several times. Dr. Oswald (*Annals of Arch. and Anthropol.*, xxviii) dates the activity of this potter to the reign of Trajan, but the presence of his wares on the Wall (e.g. Milecastle 48, *C.W.*, xi, Pl. vi, 1) and at Cardurnock (*C.W.*, xlvii, 42) shows that he was at work in the third decade of the century. Date: *c.* A.D. 110-130.
24. Form 37, Central Gaulish. A fragment bearing diagonal bead-rows and a triangle of leaf-tips. This style of decoration is one of the elements of Lezoux work which stem back to South Gaulish designs, it is confined to the work of Trajanic and Hadrianic potters. Date: *c.* A.D. 110-130.
25. Form 37, Central Gaulish. Although this piece shows only part of a large stag (*Osw.* 1697), it must be considered in some detail as it is, potentially at least, the latest fragment from deposits earlier than the dock.

The stag is not a common type, but it was definitely used by ATTIANVS and DRVSVS and probably by SACER too. It occurs in the work of ATTIANVS on free-style bowls and the present piece is probably from one of these. The working life of ATTIANVS has recently been put by Miss Grace Simpson as *c.* A.D. 140-170 (*J.R.S.* xlii, p. 161). But it is highly probable that he began work before A.D. 140. It is not possible to set out all the evidence for this view here, and a reference to a piece in his style (with the stag), from the burnt layer at Regis House (*Ant. J.* xxv, 73, no. 43) must suffice. This is unlikely to be later than A.D. 130 in view of the context

and is quite certainly pre-Antonine. So that, although a precise date cannot be given to the Heronbridge fragment, it is clear that it need not be later than about A.D. 130.

- 26, 27. Pits 1 and 2; Site III (p. 22).
26. Forms 37, Central Gaulish. This piece is from a panelled bowl in the style of CINNAMUS. The glaze is very poor being little more than an orange colour-coat. Date: *c.* A.D. 150-180.
27. Form 37, Central Gaulish. All the features of this piece occur in the work of PATERNUS, to whom it should probably be ascribed. Date: *c.* A.D. 150-180.
- 28-30. Unstratified. Fragments of form 37, all Lezoux ware. Nos. 29 and 30 are from typical free-style bowls of the Antonine period. No. 28 is the work of one of the SACER group and should be put *c.* A.D. 120-135.

III (b) PLAIN SAMIAN AND COARSE POTTERY.¹¹

Nos. 31-75 are from deposits earlier than the dock.

31. Form 27, South Gaulish. Good, cherry-red glaze. The footstand and lip grooves common on first century examples are both present; they persisted to the end of the century as their frequent presence on cups from Heronbridge testifies.
32. Form 33, South Gaulish. Dull, chocolate glaze. The piece is unusual in having a slightly convex wall (*cf.* *Oswald and Pryce*, li, 9). Taken on its own, the shape might suggest a pre-Flavian date, but the associations are against this and in fact the Domitianic-Trajanic potter MERCATO sometimes made cups with the convex wall, as a stamped example in Colchester Museum testifies.
33. Form 18, South Gaulish. Dull, chocolate glaze. A typical late-first century example.
34. Form 18/31, Central Gaulish. Bright, orange-red glaze. As the fabric and form are close to those of no. 1, a Trajanic date of manufacture is probable.
35. Form Curle 11, Central Gaulish. Dull, orange-red glaze. This piece, with its rather high bead and down-curved flange, stands late in the typological series for the form (*cf.* *Oswald and Pryce*, lxxi, 15, 18, 19; *Margidunon Samian*, xxxii, 6). Probably Hadrianic rather than Trajanic.
36. Form Curle 11, South Gaulish. Cherry-red glaze. Though only a tiny fragment this piece forms an interesting contrast with the last, being much closer to the prototype Ritterling 12 (*Oswald and Pryce*, lxxi). The high quality of paste and glaze suggest that it is an early Flavian survival.

37-40. Fragments of ring-neck flagons.

37. Orange-brown fabric, white slip. *cf.* *Prysg Field*, fig. 56, 87-9 (Flavian-Trajanic).
38. Light brown fabric, white slip. The groove between the second and third rings recalls a piece from Holt (*F Cymruodor*, xli, 108: cited as *Holt* hereinafter).
39. Red fabric, thick cream slip. For the shape *cf.* *Prysg Field*, fig. 56, 87-9 (Flavian-Trajanic).
40. Reddish brown fabric, white slip. The convex outline of the mouth perhaps foreshadows such pieces as *Leicester*, fig. 28, 12 and *Proc. Soc. Ant. Scot.*, lxiii, p. 535, 5 (Mumrills), but it is unlikely that the present piece is as late. *Holt*, fig. 67, 105 provides an earlier parallel.

The ring-neck flagon is a common type in the first and second centuries. Though there is no simple line of evolution, the general tendency is for the top ring to grow in size at the expense of the others. This process was already well advanced in some areas by the late-first century (*cf.* *Leicester*, fig. 28, 3). The Heronbridge pieces seem to reflect intermediate stages of the development and, in view of the parallels quoted, could be all pre-Antonine.

¹¹The drawings of the coarse pottery are the joint work of the writers and Mr. Wilkins.

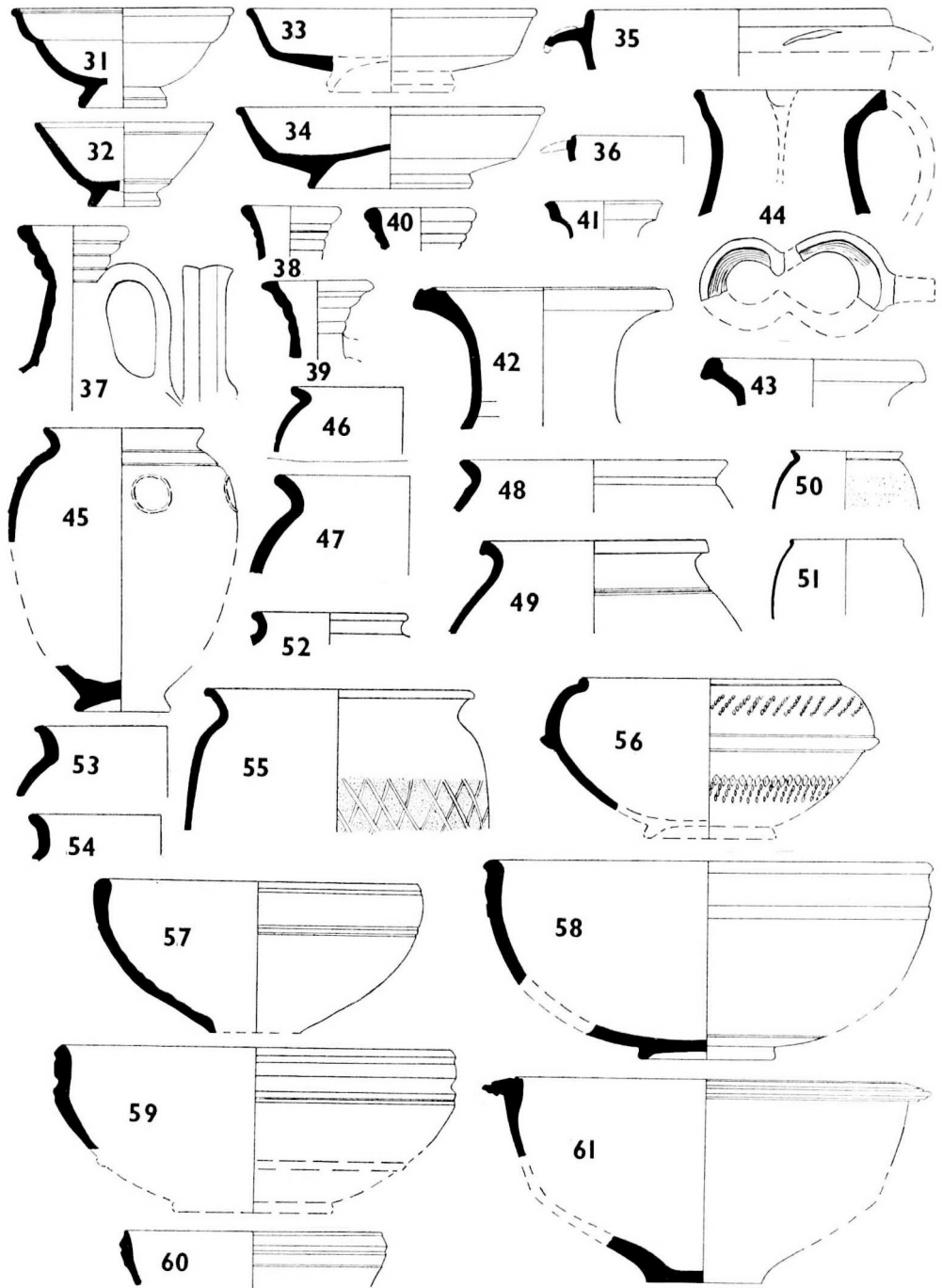


FIG. 10. Plain Samian and coarse pottery (quarter size).

41. Flagon neck in orange-brown fabric, white slip. This type had a long life, appearing first in Belgic contexts (e.g. *Verulamium*, fig. 22, 1) it lasted into the Antonine period (cf. *P. Soc. Ant. Scot.*, lxiii, p. 535). The present piece cannot be dated closely but clearly need not be later than Trajan (cf. *Wroxeter II*, fig. 18, 45; A.D. 80-120).
42. Reeded-rim flagon with single handle, in orange fabric with a heavy surface dusting of mica. Though no parallel is noted at Holt this is in a typical legionary fabric. The complete form is suggested by *Arch.*, lxxviii, fig. 21, 54, which has a feebly reeded rim. See also *Prysg Field*, fig. 56, 94-103 for some Trajanic examples. The fabric strongly suggests a date before c. A.D. 125.
43. Wide-mouthed flagon in orange-brown fabric. *Prysg Field*, fig. 63, 457 (Trajanic) is close in shape.
44. Pinched-neck flagon in grey-black gritty fabric with a highly burnished surface. It is unusual to find a flagon in this fabric which is familiar in Hadrianic-Antonine cooking pots and pie dishes. A close parallel in shape found at Birrens (*P.S.A. Scot.*, lxxii, p. 323, 1) was assigned to c. A.D. 200 on analogies of fabric, but that is obviously unsatisfactory. There is no good reason against the Heronbridge piece belonging to the period of introduction of the black burnished wares to the military zone (c. A.D. 125).
45. Jar in dark grey, micaceous fabric with feebly rusticated rings on the shoulder. For similar decoration see *Wroxeter II*, Pl. xv, 9-10. Perhaps a Holt product (cf. *Holt*, 53, 55 etc.). The decoration, rim, footstand and fabric all betoken a Flavian-Trajanic date.
46. Jar in light grey, micaceous fabric, (cf. *Holt*, 57). Several body fragments with rustic decoration apparently belonged to this vessel, which is again a Flavian-Trajanic type.
47. Jar in grey fabric with brown core. This is a featureless type, common in first period levels at Heronbridge. The fabric is typically pre-Hadrianic.
48. Medium-mouthed jar in orange-brown fabric, mica-dusted surface. While the fabric suggests legionary manufacture at Holt, the shape is unusual.
49. Medium-mouthed storage jar in hard, blue-grey fabric. Cf. *Holt*, fig. 64, 70. The type is common in Flavian-Trajanic groups in the military areas.
50. Rough-cast beaker in buff fabric with a blue colour-coat showing patches of orange. Rough-cast beakers occur in Claudian deposits (e.g. *Richborough III*, p. 179, 299) but were not particularly common before about A.D. 100. As G. Webster has demonstrated (*Ant. J.*, xxiv, p. 137), the general shape is not reliable as a means of dating these vessels. The present piece could well be Trajanic or Hadrianic.
51. Bead-rim jar in pinkish brown fabric with grey core. The thinness approaches that of 'egg-shell' ware. Similar pieces were produced at the legionary kilns (*Holt*, p. 164), but this form is not recorded there.
- 52-55. These were the only examples in pre-dock deposits of the familiar Hadrianic-Antonine cooking pot in black gritty fabric. Although the form had long flourished in the south-west of Britain (cf. Fox, *Roman Exeter*, fig. 16, 23-29 and *Ant. J.*, p. 46, Classes D and E), as Mr. J.P. Gillam has recently shown (*Arch. Aeliana*, xxxi, 237 f.) it was only beginning to reach Corbridge at the end of period III, c. A.D. 125. The presumption is that this change in styles took place at the same time over the whole of the military area, and site evidence seems to support the idea. Nor was the change limited to one type, it amounted to a complete ceramic revolution. The problems involved have a peculiar interest and are not without widespread implications, one of which is that the legionary kilns at Holt ceased to manufacture pottery at this date.

The Heronbridge jars show a tendency to have bent-over, beaded lips and, except for the neck and shoulders of no. 55, are hardly burnished at all. All are of the Hadrianic-Antonine variety of the type, as Mr. Gillam has confirmed, and so need not have reached Heronbridge later than A.D. 125.

56. Bowl with incurved shoulder and bead-rim. A prominent cordon divides the wall into zones, each with rouletted decoration. Fabric, light brown with heavy mica-dusting. The fabric is typical of Holt ware, and though the precise shape is not represented there, *Holt*, 95 has obvious connections (and is, incidentally, unlikely to be an imitation of Samian form 81). See also *Brough* 1936, fig. 10, 3 and fig. 12, 61; *Brough* 1937, fig. 14, 18.
- 57-59 are examples of the three main varieties of hemispherical bowl so typical of Holt, of the timber fortress at Chester (*C.A.J.*, 38, fig. 10, 15) and of the first period at Heronbridge.
57. Light brown fabric with traces of cream slip. Cf. *Holt*, 96; *C.A.J.*, 39, fig. 10, 53. It is improbable that this variety was an imitation of Samian form 37; it stems back rather to a Claudian bowl common in Germany as well as Britain (*Gose, Röm. Keramik im Rheinland*, Taf. 15, 220-4; *Camulodunum*, Pl. lxxxi, 251) which may perhaps also be the ancestor of the Gaulish form 37.
58. Grey fabric. This variety (*Holt*, 154) is more likely to be a conscious imitation of the Samian form 37.
59. Buff fabric with mica-dusted surface. All examples of this third variant known to the writer are in the same fabric. It was probably the commonest of the three forms. (Cf. *Holt*, 226; *C.A.J.*, 39, 55).
60. Fabric as last. This may possibly be a small variant of no. 59, but the wall appears to be slightly concave, so the vessel may be a cup similar to Loeschke 7 (*Camulodunum*, Pl. xl, s 10 A).
61. Reeded-rim carinated bowl in orange-brown fabric. In the north this is one of the most characteristic types in the Flavian-Trajanic period (cf. *Arch. Aeliana*, xxxi, fig. 12, 46 for instance) and was among the commonest products at Holt (*Holt*, p. 153). In the south-east (Verulamium, Caistor-by-Norwich and the Cambridge area) it was still being made in the Antonine period, but only a few survivals have been noted in Scotland (e.g. *P.S. Ant. Scot.* lxiii, fig. 101; *Balmuildy*, p. 90).
- 62-4. Flat-rimmed bowls with S-shaped profile and chamfered bases. These are analogues in the bowl series to the Hadrianic-Antonine cooking pots in the jars, and were introduced at the same time. (See note on nos. 52-5 and *C.W.*, 1; p. 59, 8).
62. Black gritty fabric with small white particles, rough black surface. Diameter $7\frac{1}{2}$ ins.
63. Fabric as no. 62. Scored S-shaped decoration.
64. Grey-black fabric with patches of orange at the surface. Scored vertical lines.
The decoration of nos. 63 and 64 is in interesting contrast with the lattice pattern that becomes almost inevitable in the Antonine period.
65. Fragment of an unusual vessel in orange-brown fabric. As similar pieces were made at Holt (*Holt*, 215-6), the Heronbridge piece presumably comes from there, especially as it is in a typical Holt fabric.

A recent note in *Germania* (*Jahrgang* 30, 110) lists the German examples and mentions a few from Britain. The list may be extended to include vessels from:—

- (a) Litlington, Cambs. (Fox, *Arch. of the Cambridge Region*, pp. 189, 208-9).
- (b) Silchester. (May, *Silchester Pottery*, p. 119, 71).
- (c) High House Mile castle (*C.W.*, xiii, p. 359 and Pl. xxvi, 123A).
- (d-h) Holt. Five examples in two variants. (*Holt*, 215-6).
- (i) Upchurch, Kent, an example with handles (Roach Smith, *Coll. Antiq.*, VI, Pl. xxxvi, 16).
- (j) West Stow Heath, Suffolk, made in the kilns (*Proc. Suff. Inst.*, xxvi, fig. 11, 10).
- (k) Heronbridge.

The purpose of these vessels is obscure; use as wine-coolers, milk-boilers, flower-vases and incense-burners have all been suggested. However, the difficulty of pouring out a liquid through the central aperture of the dome militates strongly against the first three suggestions,

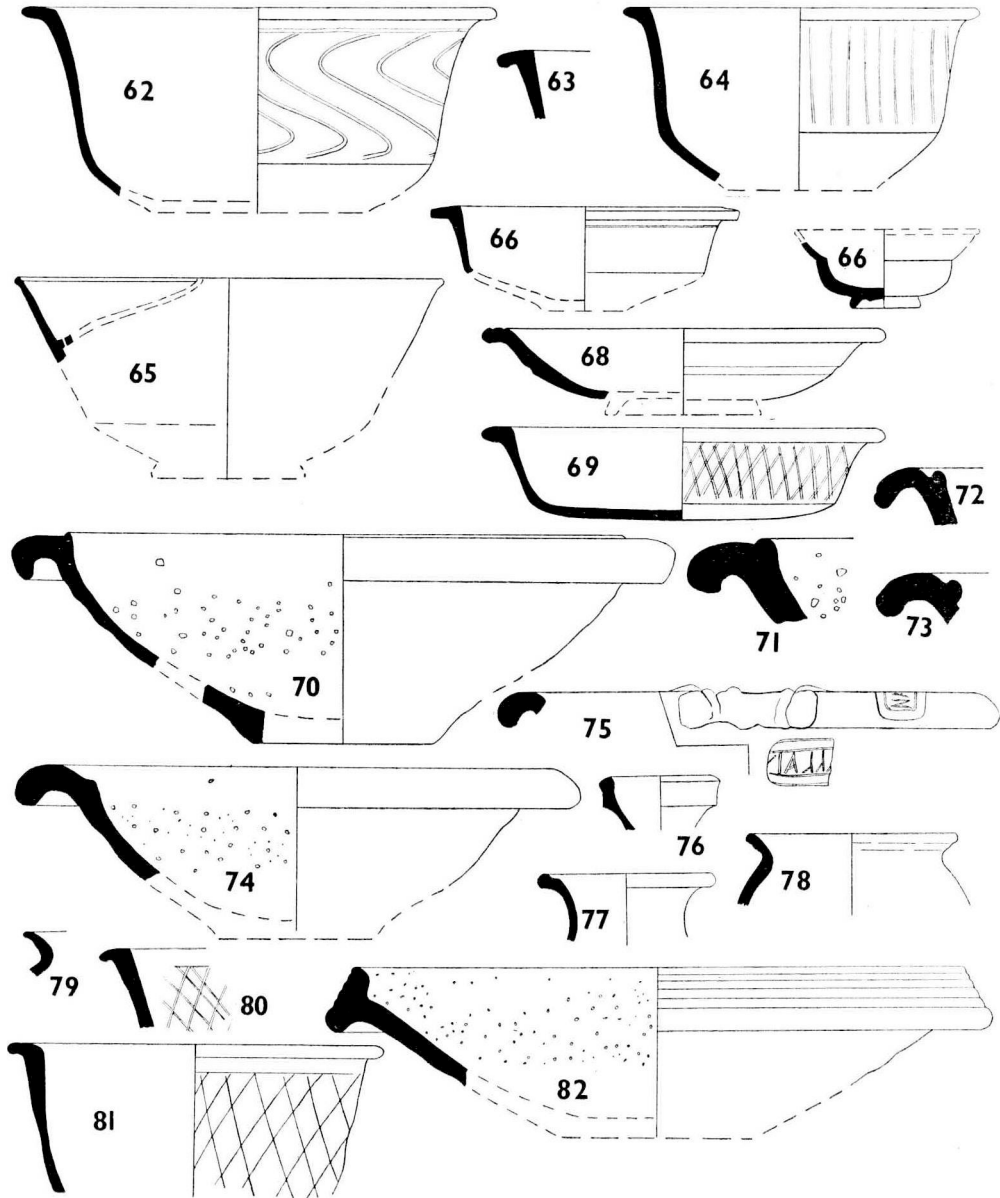


FIG. 11. Coarse pottery (quarter size).

66. Cup imitating Samian form 27 in orange-brown mica-dusted fabric. The form was made at Holt (*Holt*, 166) and the Heronbridge piece may safely be attributed to the legionary potters and to the Flavian-Trajanic period.
67. Carinated dish in grey fabric, lightly burnished surface. This is in essentials a simplified version of no. 61. Parallels are forthcoming from Birdoswald (*C.W.*, xxx, fig. 16, 64) and from a pre-fort deposit at Chesterholm (*Arch. Aeliana*, xv, fig. 2, 17).
68. Reeded-rim dish in red-brown fabric with mica dusting. A typical Holt product (*Holt*, 169-170).
69. Dish, black fabric with slightly burnished surface bearing lattice decoration. This is a typical dish of the series frequently found in Hadrianic-Antonine associations with the black burnished cooking pots and bowls (see notes on nos. 52-5, 62-4). For our present purposes it is sufficient to quote *C.W.*, xxx, fig. 16, 72 from Period Ia levels at Birdoswald as evidence for Hadrianic use of the type.
70. Mortarium in buff fabric with white grit. Parallels may be seen in *Holt*, 10 and *Jenkins Field* fig. 34, 108 (A.D. 70-110).
71. Mortarium in grey-brown fabric with white grit. Diameter 15ins. The heavy rim and wall are common features of Holt mortaria (*Holt*, 4, 6, 8); a closer parallel is provided by *Prysg Field*, fig. 59, 258 (early second century).
72. Mortarium in orange-brown fabric with traces of a brown surface wash, small white grit. Diameter 14ins. This is a Hadrianic-Antonine type, cf. *C.W.*, lii, fig. 6, 21 (Milecastle 79) and references cited there.
73. Mortarium in orange-red fabric with thick white slip. Cf. *Holt*, 13 which is in similar fabric and *Arch. Aeliana*, xxvi, 187 and fig. 2, 40 ai; (by MESSORIVS MARTIVS, see no. 74).
74. Mortarium in red fabric with grey core, thick cream slip. Grit abundant, black and white. This piece is perhaps by MESSORIVS MARTIVS (cf. *Arch. Aeliana*, xxvi, 187 and fig. 2, 40, which is of the same shape and fabric).
75. Mortarium rim in buff-brown fabric, moderately sandy texture. Stamped JLLAN[(retrograde) on each side of the spout. Mr. Eric Birley has kindly examined a rubbing and suggests restoration as LALLANS. He notes other examples from Silchester, London, Otford and Castor, so it looks as though LALLANS was a Midland potter. The rim alone survives and it is not possible to date the piece typologically.
- 76-81 FROM PITS 1 AND 2 OF SITE III (p. 22).
For the associated Samian see nos. 26 and 27. There is a marked contrast between this group and the material from pre-dock levels. All the pieces could well be of Antonine date, which agrees with the associated Samian (of c. A.D. 150-180).
76. Flagon, orange-brown fabric, cream slip.
77. Wide-mouthed flagon in coarse, sandy, brown fabric.
- 78 and 79. Jars in black burnished fabric.
- 80-81. Bowls in black fabric with burnished surfaces and lattice decoration.

FROM THE FILLING OF THE DOCK (see p. 20).

82. Hammerhead mortarium in pipe-clay fabric with dark brown and bluish-grey grit. Traces of brown paint on the flange. The hammerhead mortarium first appeared in the early-third century (Kenyon, *Leicester*, p. 79) but seems to be especially common in the military zone in the late-third and early-fourth century. Within these limits it is difficult to date individual pieces closely, and it can only be suggested that this piece belongs to the second half of the third century.

III. (c) SMALL OBJECTS (by Katharine Kaine) (Fig. 12).

1. Gem stone in red jasper, bevelled on the underside. The stone is damaged but the engraving is almost complete and shows Aphrodite standing to left holding a spear in the right hand and a helmet in the left. She wears a *chiton* and a *chlamys* hangs down from the left shoulder. On the head is a fillet. A larger but similar Aphrodite engraved in red jasper is figured by Walters (*Cat of Gems in B.M.*, LXX, 1448), though in this case the helmet and spear are in the opposite hands and the *chlamys* is absent. It is interesting to note that an Aphrodite with similar stance and attributes is found on coins of the Julian house (*Daremberg and Saglio*, V, p. 733 and fig. 7402). Red jasper was commonly used for gems from the first century A.D. The present example is small while the engraving, as is commonly the case with gems of the second century, is crude.

Found in Pit 1 on Site III with pottery of exclusively Antonine date (c. A.D. 150-180).

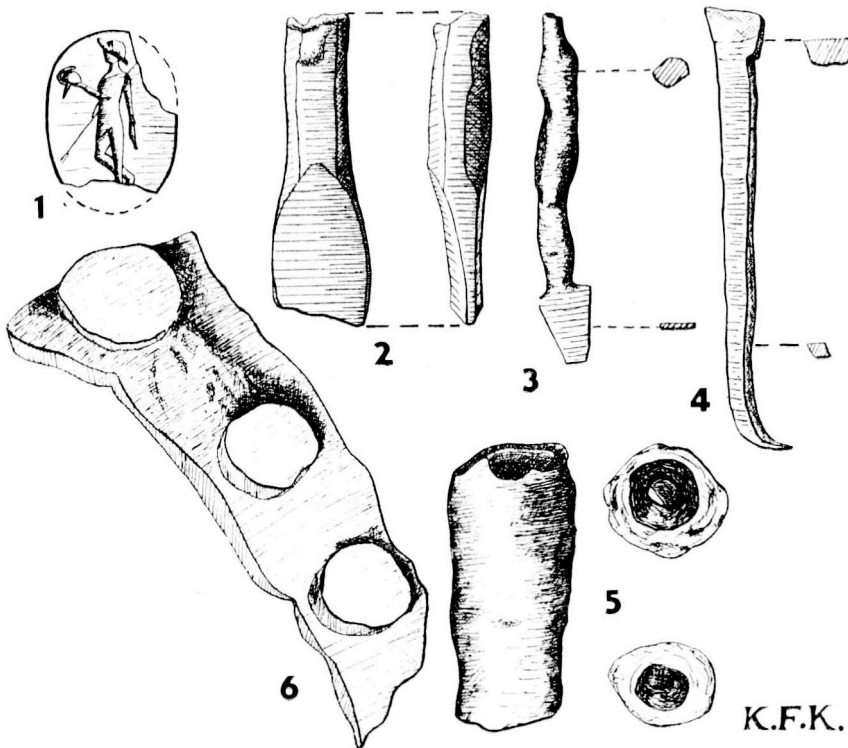


FIG. 12. Gemstone and lead objects. No. 1 $\frac{3}{4}$ Nos. 2-6 $\frac{1}{4}$

- 2-5. A group of lead objects from below the pitching north of the dock.
2. Model of a small chisel or metal-worker's tracer. Though chisels must have been used by masons and metal smiths few have been recorded and no other model in lead can be cited.
3. Roughly modelled object with approximately cylindrical shaft and flattened, sub-triangular head which may well have been pointed originally. This may perhaps have been intended for a model spear though there are other possibilities, such as a stylus, surgical implement or fine metal-worker's graver.
4. Full-sized model of a nail with roughly rectangular head. Another similar example was found.

5. The nozzle of a pipe with tapering bore, broken off at the wider end. This should probably be grouped with the preceding objects as a model, since the bore appears to be too narrow for it to have served as a water pipe while no other functional use can be suggested.

This small group of lead objects raises some interesting problems. Though the precise nature of the objects being copied is not always certain, the use of lead makes it clear that we are dealing with models and not with functional tools. Models of tools and weapons have been found at many British and Continental sites, (For a recent list see *Oxoniensia*, XIV, 32 ff), but these are usually in bronze, though sometimes iron, bone, or even silver were used. As Miss Kirk points out in her paper on the Woodeaton bronzes, many of these models must have had a religious significance. The use of lead for such models appears to be uncommon, the only instance known to the writer being a hoard of fifty lead axes from Uriage, there clearly intended for votive use. (J. Toutain, *Les cultes païens de l'Empire romain*, vol. III, 366ff).

While the Heronbridge pieces could be votive copies of a metal-worker's equipment there are other possibilities to be considered, children's toys for instance come to mind, though the presence of lead nails does not encourage this view. Again, the models may be merely the result of a lead-worker's idle half-hour, though they may have had more a direct connection with metal-working, as the use of lead dies for making bronze-workers moulds is not unknown, (cf. *Lydney*, 15 and Pl. VI). It is not impossible that we are dealing with dies of this sort, though the nails once more suggest otherwise.

It is clearly impossible to determine between the various possibilities on the evidence available. As an important metal-worker's settlement, Heronbridge might be expected to have had a temple or temples at which the tools of the craft might suitably have been dedicated. The part of the site in question, however, yielded no indication of religious usage and the matter must be left open.

6. A crudely worked strip of lead, roughly symmetrical and decorated with three raised, circular, flat-topped studs. Though again the object may have been a die, the impression received is rather that it was intended for use on a lead casket or the like.

Found in the filling of the drainage channel below the pitching north of the dock.

III. (d) GLASS.¹²

The pre-dock levels produced a dozen pieces of glass, all fragmentary and of little intrinsic interest. Except for No. 1, which is almost colourless, all show marked green tints due to the relatively high iron content.

1. Fragment of the wall and base of an *olla* or jug. Probably of first-century date.
2. Rim of a bottle, the type usually associated with the rectangular variety.
3. Handle and body fragment of cylindrical bottle.
3. Handle and body fragment of a cylindrical bottle.
4. Several fragments, probably from the neck of an *unguentarium*.
5. Body fragments of rectangular bottles.
6. Fragment of roller-moulded window glass.
7. Fragment of a gaming-counter with segmental section in dark green glass.

Dr. Harden considers that all these pieces are of first or second century date, an opinion that agrees well with general date assigned to the pottery (A.D. 90-140).

III. (e) COINS.¹³

Only two coins were found, both unstratified.

1. Constantine I. Reverse: VICTORIAE LAETAE PRINC PERP (Cohen 633) A.D. 307-337.
2. Trajan—Sestertius. Obverse illegible. Reverse: SPQR OPTIMO PRINCIPII. Victory standing right, fastening a shield inscribed VIC DAC on a palm tree. A.D. 103-111.

¹²This list is based on notes by Dr. D. B. Harden who kindly examined the material.

¹³Kindly identified by Mr. Graham Webster.

III. (f) SLAG, ETC.

Dr. J. A. Smythe has kindly examined and reported on various metallic bodies submitted to him. The following notes are extracts from his report:—

1. Two pieces of sheet lead (28gm.). These were heavily encrusted with carbonate of lead. They were melted with a reducing agent and the metal cast. The S.G. was 11.37, which is the value of pure lead and of much Roman lead that I have examined.
2. Two pieces of black, vesicular slag (25 gm.). The slag was hard and magnetic. It was gelatinised with concentrated hydrochloric acid and was found, analytically to be essentially composed of ferrous silicate. It thus has the properties of a bloomery slag, formed by the reduction of iron ore.

 ABBREVIATIONS

Ant. J.: *Antiquaries Journal*.

Arch.: *Archæologia*.

Ariconium: Jack G. H., *Excavations on the Site of Ariconium*.

Baddeley: *Baddeley St. C., Chedworth Roman Villa*.

Buckman and Hall: *Notes on the Roman Villa at Chedworth*.

B.B.C.S.: *Bulletin of the Board of Celtic Studies*.

C.A.J.: *Chester and North Wales Archæological Society Journal*.

H.S.L. & C.: *Historic Society of Lancashire and Cheshire Transactions*.

Holt: Grimes W. F., *Holt, Denbighshire (Y Cymmrodor XLI)*.

J.R.S.: *Journal of Roman Studies*.

Lydney: Wheeler, R.E.M. and T.V., *Excavations in Lydney Park*.

Oxon.: *Oxoniensia*.

P.S.A.L.: *Proceedings of the Society of Antiquaries (2nd series)*.

P.S.A.S.: *Proceedings of the Society of Antiquaries of Scotland*.

P.S.A.S. (Bath): *Proceedings of the Bath and District Branch of the Somerset Archæological Society*.

Richborough: Bushe-Fox J. P., *Excavations of the Roman Fort at Richborough*.

S.J.: *Saalburg Jahrbuch*.

Segontium: Wheeler R. E. M., *Segontium and the Roman Occupation of Wales (Y Cymmrodor XXXII)*.

Templebrough: May T., *The Roman Forts at Templebrough (Templeborough near Rotherham)*.

Tiddington: Fieldhouse, May and Wellstood, *A Romano-British Industrial Settlement near Tiddington*.

Westmorland: *Report of the Historical Monuments Commission on Westmorland*.

Wilderspool: May T., *Warrington's Roman Remains*.

Wroxeter I-III: Bushe-Fox, J. P., *Excavations at Wroxeter 1912-14*.

Wroxeter IV: Atkinson D., *Excavations at Wroxeter (Viroconium) 1923-7*.

