

ROMANO-BRITISH POTTERIES ON THE UPCHURCH
MARSHEs

By I. NOËL HUME

IT cannot be denied that the archæology of the Upchurch Marshes presents problems that are considered in some quarters to be well-nigh insoluble, or that the enthusiasm of the nineteenth century antiquaries has failed to live on in those of the present generation. It has often been felt that marsh finds can be of little value and so, unhappily, the Upchurch sites have been left to the ravages of the tide and the pot hunter. In an attempt to overcome this apathy two sites have been watched, between 1949 and 1954, with results that have proved unexpectedly satisfactory. Evidence has appeared which proves that the marshes supported pottery-making communities, the wares from which varied from the finest to the very poorest qualities. An examination of the vessels recovered during the last hundred years would have made this fact clear without the corroborating evidence of the new finds, but for some unexplained reason that examination has never been properly made.

Early antiquaries invented the term "Upchurch Ware" and it is one that has persisted into the present century without having any real significance. It has been applied indiscriminately to anything from poppy-head beakers to native copies of Samian decorated forms. While it is true that these and many other wares have been found on the sites, there is no evidence to suggest that the Upchurch potters specialized in particular shapes. It would clearly be unwise to attribute basic forms to any one pottery or group of potteries, for popular designs must have been copied wherever markets could be found for them. An example is provided by the bitumen-varnished wares decorated with groups of incised lines and concentric circles, *Silchester*, Pl. LXXI, Type 164, which have been variously described as "Upchurch," "London" and "Weymouth" wares. These and other sweeping generalizations have done much to reduce confidence in past work on the Upchurch sites. This is to be regretted for there is much that is of value in the earlier studies. Before discussing the recently discovered kiln evidence it is necessary to recall briefly the archæological history of the sites during the last hundred years.

While there have been many who have dabbled in the Upchurch mud, four names are particularly associated with the area—Charles

Roach Smith, George Payne, the Reverend C. E. Woodruff and Cumberland H. Woodruff. Between them these antiquaries recovered some hundreds of virtually complete vessels, many of which are preserved in the British, Rochester and Maidstone Museums. Unfortunately their records are not sufficiently detailed to substantiate their claims to have found kilns, and their catalogues of finds apparently no longer exist. One is left, therefore, with an impressive collection of pots and little knowledge save that they were all found at unspecified points on the Upchurch marshes. However, there is reason to suppose that a large proportion of the nineteenth century finds were recovered from Otterham Creek. In his *Collectanea Cantiana* (p. 79) Payne quoted a letter from Mr. Cumberland Woodruff, who stated that :

“ . . . the greatest number of the vessels in my collection came from Otterham Creek ; the right bank for about three-quarters of a mile, halfway between Otterham Quay and the mouth of the creek has yielded a large number of specimens—they have also been found on the Motley side. It is on the right bank that I have seen the clearest traces of kilns. . . . ”

To-day no evidence remains, an examination of each bank producing only three Roman sherds and an early sixteenth century purse frame. One of the sherds, of third century date, was similar to Fig. III, No. 4, a factor which adds weight to the suggestion that the two late wasters in Rochester Museum were found on this site.

The marshes still hold a persistent fascination for the treasure-hunter and in recent years the remaining sites have received much unwelcome attention. It must be explained that the saltings in the Upchurch area are private property and are carefully maintained for the preservation of game. Much money has been spent in an attempt to hold back the sea that annually encroaches on strayways linking the now almost isolated marsh tracts. Unfortunately this process of encroachment has frequently been speeded by thoughtless attacks on the clay banks by those who seek intact pottery. The damage has on occasions been two-fold, for the advent of expeditions in force during the nesting season has wrought havoc with the bird life. For these reasons the writer has been requested not to provide map references to the find-spots. It must be sufficient to state that the two sites under consideration are situated in the Slayhills and Milfordhope areas, and are divided by two stretches of salting and a wide creek.¹ While there is no evidence to suggest that they ever formed part of a single settlement, the finds from each are identical in their range. The same is true of material from another small site to the north of the Hamgreen Saltings, an area almost entirely eroded and practically inaccessible.

¹ The location of the sites is known to the Editors, who agree that it should not, in all the circumstances, be made public. (*Editors' Note.*)

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From an archæological point of view all the exposed marshland sites present a similarly difficult proposition, for they will not respond to any accepted excavation technique. The sea has removed the original land surfaces, leaving small islets rising, at most, eight feet above the surrounding mud flats. Here alone is it possible to trace any signs of stratification and then only in lengths too short to make possible the drawing of useful sections. Again, at points where longer faces of strata are exposed in the banks of strayways, they are so uneven as to badly distort any possible sections. Even the pin-pointing of exact find-spots is made well-nigh impossible by the lack of map detail and the constantly changing outline of the firm ground.

The fact that the existing surface of the flats lies below the Roman land surface ensures that there can be little hope of recovering any stratified material save that which lies in rubbish pits cut into the natural clay. While structural remains may still exist in the form of deep foundations, none have been noticed in recent years, although roofing tiles and pieces of ragstone have been found at Slayhills, and roofing, flooring and hypocaust tiles have been recovered from Milfordhope. Reference is made in the *V.C.H., Kent*, p. 132, to traces of a ragstone building having been found to the north of Slayhills on the bank of Sharfleet Creek. The loss of the Roman land surface reduces the chance of locating kiln remains to a minimum, for even if traces of stoke-holes or furnace beds are still *in situ*, the prevailing conditions would prevent careful excavation. Both Slayhills and Milfordhope have displayed fragments of briquetage flooring and on the latter site a single floor covered an area approximately 70 feet by 40 feet. The surrounding and overlying clay had been eaten away by the sea on all sides so as to leave a weed-covered platform standing some five inches above the mud flats. A section cut through the briquetage showed it to be roughly 12 inches in thickness and resting on a 3 inch bed of charcoal which in its turn overlay the natural clay. This may, perhaps, be compared with rather similar finds on the Red Hill sites in Essex (*Pro. Soc. Ant.*, XXIII, p. 76).

The absence of any kiln structure makes it necessary to rely entirely on the evidence of pottery and kiln furniture. The latter is represented by numerous pieces of clay that have been fired to a soft biscuit, i.e., at a temperature of between 600° and 700° F., firing in most cases having taken place in an oxidizing atmosphere. The lumps or pads of clay vary in size from one inch to four in diameter and some are impressed with clear finger-prints. Fig. 1, No. 1 illustrates an example which after being worked in the hand was pressed against coarse grass and slashed with a knife. The purpose of firing these pieces of waste clay is not clear, but one fact at least is certain and that is that the objects would not have been carried far from the kiln site. It has been suggested

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that sedge-impressed pads, as shown in Fig. 1, No. 2, may have been used in the construction of oven roofs.

Among other examples of fired clay are flat fragments of various sizes which have been pierced by sharpened sticks having an average width of $\frac{3}{4}$ inch at the top. The pieces vary in thickness from $\frac{1}{4}$ inch. to 1 inch, and are fired, under oxidation, to differing degrees of hardness. It has been thought that such pierced fragments once formed part of an oven floor. The recently found pieces do not show any signs of overburning, a feature that would have been expected had they been used for that purpose. Overburning does appear, however, on a fragment of briquetage from Milfordhope. The piece has been exposed to a temperature sufficiently high as to produce complete vitrification of the exposed areas (paralleled *Pro. Soc. Ant.*, XX, p. 184). Of more obvious significance is an edge fragment from a clay slab $5\frac{1}{2}$ in. by $7\frac{1}{4}$ in. and $\frac{3}{4}$ in. in thickness, which was found at Milfordhope. The slab has been smoothed at the edge and on the upper surface, but remains rough beneath in the manner of the common Roman building tile. While its purpose is not known, its importance lies in the fact that the fabric contains small flint chips and is pale grey in colour oxidized to a pale pink in patches. The ware is identical with that of the principal products from the Milfordhope kilns. Further evidence from this site is provided by a "squeeze" of waste clay of the same ware, Fig. 1, No. 9, which may have served as a kiln pad. The presence of such waste material along with innumerable sherds of vessels of an identical ware may be thought sufficient evidence of local potting without the support of irrefutable wasters or kiln structures. True wasters have, however, been found on both the Milfordhope and Slayhills sites and these will be discussed in their proper place.

An examination of the mud flats under favourable tidal conditions has, from time to time, made possible the partial excavation of rubbish pits which lie sealed beneath the more recently deposited alluvial clay, and on these occasions it is possible to recover dated pottery groups. Of the numerous pits examined only two have any direct bearing on the present problem and these were both encountered at Milfordhope.

PIT A. A.D. 50-70

This pit, of indeterminate proportions, contained a small number of pottery fragments of grey ware flecked with flint chips. With these was half a large, bead-rimmed olla of the same ware, Fig. 2, No. 1, inside which lay a rather similarly potted, bulbous pot (Fig. 2, No. 2), marred at the base by the loss of a flake which is thought to have been detached in firing. It seems likely that the pit represented a refuse tip from a kiln producing this characteristic grey ware. Unfortunately the excavation had to be abandoned in the face of a rapidly flooding tide.

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PIT B. A.D. 90-120

This pit, diameter approximately 9 feet, was partially cleared under conditions which permitted a more careful examination of the stratification. Beneath an upper filling of mud, 1 inch in thickness, was encountered a 6 inch deposit of burnt daub and wood, in which were found a number of broken *tegulae* and the corner of a large tile, 3 inches in thickness and polished on all its exposed edges. This is a feature unusual among Roman tiles, for the undersides are invariably rough having been laid in sand. While the tile is inordinately thick it is not without parallels (see Brit. Mus. cremation interment from Windsor Great Park, *B.M. Guide*, p. 98), but tiles of this size are rarely polished. The only potsherd from the level was a fragment of a Samian Drag. Form 33 of good quality, possessing the median groove characteristic of the shape in the second century. The wall has a slight external concavity but the fine quality fabric would suggest a date in the last decade of the first century or the first of the second. Below these finds lay a 3 inch filling of clay under which were found the remains of coarse grass. The clay at the base was seen to be honeycombed with root-impressions which showed that the grasses had grown there and had not merely been thrown into the pit as part of the filling. It was made clear by this evidence that some time elapsed between the digging of the pit and the advent of its clay filling. Payne referred to a similar feature, *Coll. Cant.*, p. 78, when he suggested that pots had been "thrown into a rush grown swamp or pond, probably one of the places from which the clay used in their manufacture had been excavated . . . underneath there is often a layer of sedge or peat." At the bottom of pit "B," resting on the organic matter, were found two incomplete pots of widely differing forms. The first, a fine quality beaker (Fig. 2, No. 7), had five blisters on the body, one of which broke through the side leaving no doubt that the vessel was a true waster. The second pot (Fig. 2, No. 6), a well-made but common cooking-pot form, was found to contain a shoulder fragment of an identically shaped and decorated vessel of a slightly larger size. The surface and polished ornamentation of both had been perfectly preserved and showed no sign of the pots having been used. Such a coincidence certainly suggests that the pots were rejects from a nearby kiln. But while no irrefutable waster of this shape has been found, the ware is paralleled by a badly blistered rim fragment from Slayhills (Fig. 1, No. 7).

The combed olla (Fig. 2, No. 1) from Pit "A" is representative of a wide range of wares of similar paste and decoration which might be termed if anything can, "Upchurch" or "Medway Ware," for these alone are peculiar to the marsh sites. The combed ornamentation which may be applied in combinations of latitudinal and longitudinal groups is principally employed on bead-rimmed cooking-pots but

occasionally appears on finer wares. (For full details see *Rich. II*, p. 97ff, and Pl. XXX.) The Upchurch examples when correctly fired in a reducing atmosphere are of a hard grey ware containing flint chips (Fig. 2, No. 1), but when oxidized they range in colour from purple to various shades of pink. In the latter instances many of the fragments are so badly cracked that it would have been impossible for the vessels to have been used. A pit at Slayhills was found to contain quantities of charcoal, briquetage and large numbers of cracked sherds from bead-rimmed ollæ, many of which bear the characteristic combed decoration. It has been suggested that the cracking and oxidation may have been caused by the sherds having been subjected to excessive heat at some time subsequent to their manufacture. Experiments conducted with this in mind resulted in both local and complete oxidation of reduced sherds but they did not produce cracking. Examples from the above-mentioned pit were submitted to Mr. A. Markes, a director of the Avoncroft Potteries, Stoke Prior, Worcestershire, and he replied as follows :

“ I think it unlikely that the multiple cracking was caused by being thrown into the fire. After examining the sample sent to me, I am sure that it is a waster.”

While, on this assumption, bead-rimmed ollæ are represented by numerous wasters, only one sherd cannot be disputed. This is a rim and shoulder fragment (Fig. 1, No. 8), which has been completely flattened during firing, possibly by excessively tight packing or by another vessel having fallen against it in the kiln. The waster was found at Slayhills in a layer of burnt debris from which numerous Claudian sherds were recovered.

Only one further true waster has been found during the observation period and this, a base fragment of sandy grey ware, came from Slayhills. The sherd, overfired and twisted (Fig. 1, No. 10) appears to have formed part of an early second century olla, but unfortunately it is not large enough to be of any real value.

The number of wasters found are very few indeed when compared with the mass of sherds that have been examined, but this may be partly accounted for by the fact that distortion can rarely be detected unless a large proportion of the vessel is recovered. Similarly, cracked pots when thrown aside would invariably break along the cracks, a feature that can only be discerned under careful examination. Further evidence can, however, be provided by the parallels of ware in the kiln waste and finished products. But by so doing it is possible to attribute scores of different vessel-shapes to the local industry. While there is reason to suppose that the Upchurch potters *did* manufacture an enormous range of wares, such an assertion requires further evidence. It will be remembered that the Upchurch sites have been described in

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expansive terms before ; it has even been said that " in this obscure corner of Kent existed one of the most important industries of Roman Britain." No one would suggest to-day that the Medway potteries catered for a national market. Few examples reached as far as London, but there is little doubt that they had a considerable distribution in the South East. This is a matter that waits further study, but it is enough in the first instance to record that the wares reached Richborough in very large quantities. It may be wondered whether the products were further distributed from this centre.

An examination of the suggested local wares reveals the hands of both skilled and less talented craftsmen, some of the products being of the finest quality while others are ill-balanced, poorly turned and elementary in design (Fig. 1, No. 11). The fragments represent most of the shapes common in the first and second centuries, and also include the more specialized forms, incense cups, lamp holders, spindle whorls (Fig. 1, Nos. 3-5), models (Fig. 1, No. 6), colanders and lamp fillers. There is no evidence to suggest that ewers were manufactured in the area although a number of intact examples have been found. These are of white ware or more commonly a pink ware coated with white or yellow slip. Incomplete mortaria and amphoræ have been encountered but these were presumably imported.

SOCIAL IMPLICATIONS

It seems likely that numerous small settlements were scattered along the clay shores of the Medway and that their inhabitants were concerned with the manufacture of pottery, the raising of stock, and to a lesser extent the extraction of salt from sea water. It may well be that the saltings collectively known as the Upchurch Marshes were the centre of the potting industry. On the other hand there were many equally suitable sites around the Medway and Thames marshes which may have housed potteries that have passed unnoticed or still await discovery.

The vegetation of the Upchurch marshes seems to have changed little, for then, as now, the water dictated the nature of the land. As mentioned earlier, few traces of buildings have been found¹ but the discovery of partially decayed ozier rafts and the bases of wooden posts indicate that numerous light structures had existed at Slayhills. While innumerable timbers are to be found on the sites only a small proportion can be safely attributed to the Roman period. Thick depositions of burnt clay, potsherds and charcoal at both Slayhills and Milfordhope suggest that kiln waste was laid down as hard core over the wet clay. Post-holes appearing on these levels and penetrating through them add further weight to this assumption.

¹ For a note on possible foundation deposits see *Arch. Cant.*, LXIV, p. 170.

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From the scanty evidence available it would seem that the communities were, on the whole, poor but that there existed among them an occasional family of substance. The roofing, flooring and hypocaust tiles might perhaps have come from the house of a master-potter. Such a person would have appreciated the merits of fine, imported wares and this might account for the stray fragments that are present on the sites. The remains of Belgic stamped dishes have been found, possibly the prototypes from which a wide range of local dishes were copied. Samian ware is extremely rare and averages less than 1 per cent. of the total number of sherds examined. Among fragments of 38 vessels recovered five decorated Form 37's were represented, all of Hadrian-Antonine date. One of these, of poor quality, had been repaired by riveting. A rim fragment from an Antonine Form 33 had been similarly mended. (See also *Coll. Cant.*, p. 80.) On the face of the existing evidence, it would appear that Terra Sigillata of any quality was highly prized by the inhabitants of the Upchurch settlements. This may be thought curious in view of the high standard achieved by many of the local products.

OCCUPATION SPAN AT SLAYHILLS AND MILFORDHOPE

Geographically and archæologically the two sites can be treated as one although, as mentioned earlier, there is no evidence to suggest that the settlements were ever joined. It seems likely that occupation began in the years directly preceding the Claudian invasion and continued until the last years of the second century. The opening date is suggested by the presence of *Swarling* types and the closing by the fact that no third or fourth century sherds have been found on either site. Such negative evidence is, of course, open to dispute as is the date of the previously published cavetto-rimmed olla from Slayhills (*Arch. Cant.*, LXIV, p. 170, Fig. 8, No. 1). Three hoards from Slayhills are of significance, two noted by Payne, *Coll. Cant.*, pp. 74-76, both of which contained silver jewellery of Antonine date, and the third, a small pot containing thirty-two bronze coins (*J.R.S.*, XLIII, p. 127), found in 1952 and probably deposited in the closing years of the second century. It might be thought possible that some single event caused the abandonment of both Slayhills and the Milfordhope sites.

OTTERHAM CREEK

While Romano-British occupation debris is no longer to be found on either bank, previously collected evidence cannot be ignored. Two true wasters in Rochester Museum, Fig. 3, Nos. 4 and 5, are thought to have been found on this site, and they are both of third century date. It is suggested, therefore, that potting continued on the banks of Otterham Creek for some time after it had ceased at Slayhills or Milford-

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hope. It may or may not be significant that Otterham Creek affords greater shelter than could be obtained at either of the other sites.

Mr. N. C. Cook owns a copper plate for the reproduction of a nineteenth century drawing showing pot-hunting in progress in Otterham Creek. Among the pots shown in the foreground are two that are clearly of third century date and another that cannot be earlier than the fourth. This last is unlikely to have been of local manufacture and may well have come from another site. It is of interest that among fifteen pots illustrated, three are decorated with concentric semi-circles and vertical incised lines. It seems probable that the largest of the three was drawn from a vessel now in the British Museum (M.2670). Sherds of this type are rare at Slayhills and Milfordhope, but those that have been recovered are notable for their remarkably high-quality finish.

CONCLUSION

An examination of various Romano-British sites in the Upchurch area, notably at Slayhills and Milfordhope, has provided evidence to support the early contention that the inhabitants of the marsh settlements were concerned in the manufacture of pottery. There is every indication that a wide range of wares was produced over a long period, but that the life of the settlements varied for reasons that have yet to be explained. Pottery evidence from the two specified sites indicates habitation from about A.D. 40 to approximately A.D. 200, but that occupation or the pottery output became less intensive after about A.D. 130. The evidence suggests that a large proportion of the sherds from both sites is of local manufacture and that the industry was far too large to serve only local demands. It is therefore suggested that the products were intended for sale elsewhere, a contention borne out by finds from other sites. No Late Roman or Saxon material has been found, but a small number of thirteenth century sherds have been recovered from both Slayhills and Milfordhope.

FIG. 1. WASTERS, KILN WASTE AND POTTERY SMALL FINDS

1. Example of waste clay fired to a soft biscuit after being slashed with a knife. From a Claudian layer with Nos. 2 and 8. Slayhills.
2. Pad of clay with multiple grass impressions fired to a soft biscuit. Provenance as above.
3. Whorl of grey ware with oxidized surface. White, grit chips in the paste as in Nos. 8 and 9. Slayhills. Unstratified.
4. Whorl of hard, grey, sandy ware with local oxidation. Slayhills. Unstratified.
5. Crude whorl of hard, brown ware, paste as waster No. 8, Fig. 2. Slayhills. Unstratified.

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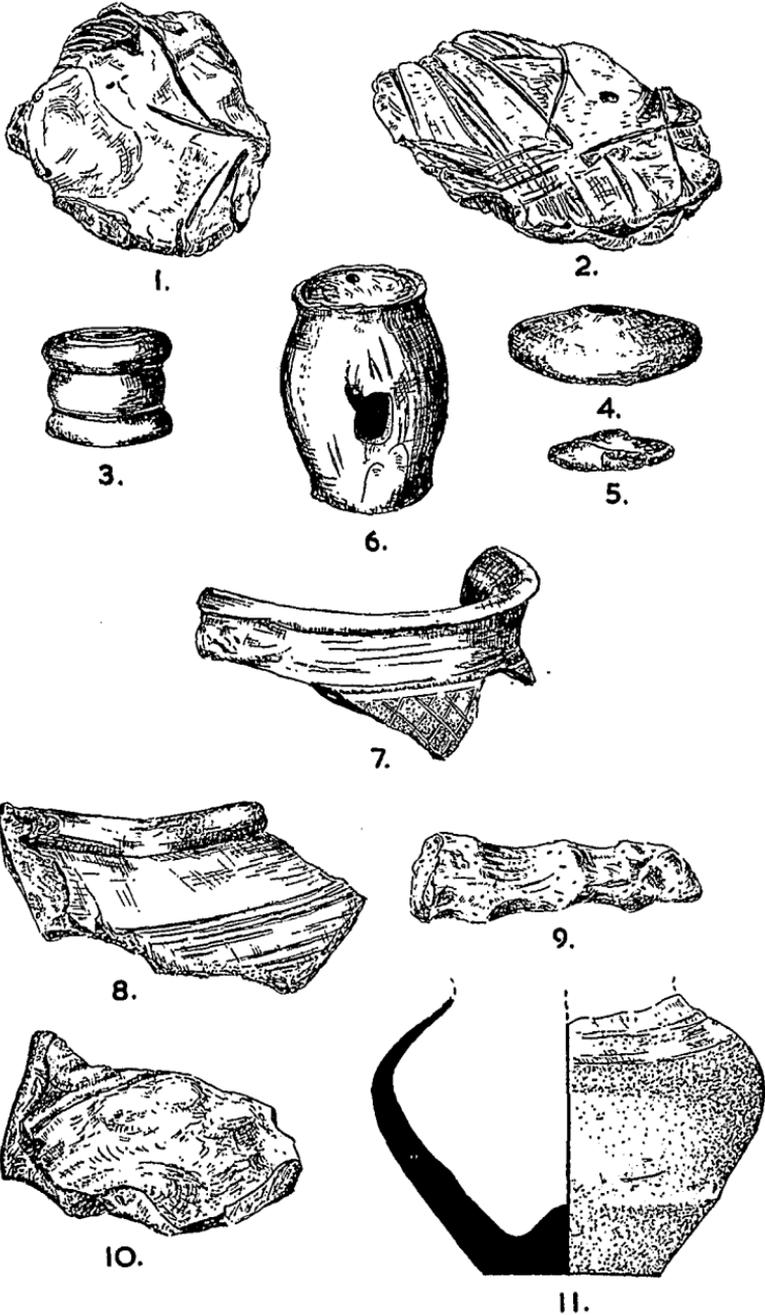


FIG. 1. Wasters, kiln waste and pottery small finds. (1/2)

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6. Model barrel of hard, brown ware marred by grass impressions. Ware paralleled as above. There is a small tap hole at one end and a disproportionately large bung-hole in the side. Slayhills. Unstratified.
7. Rim fragment of hard, grey, sandy ware with burnished, metallic surface to rim and hatching on the shoulder. The everted and slightly undercut rim is sufficiently blistered for it to be classified as a waster. Slayhills. Unstratified. Late first to early second century.
8. Rim fragment of bead-rimmed olla of hard, grey ware containing white grit chips. The juncture of the shoulder and body is slightly raised and the latter is ornamented with combing or furrowing. The sherd has become completely flattened in firing, possibly through being tightly packed in the kiln or by an adjacent pot having fallen against it. Found in a layer containing kiln waste (Nos. 1 and 2) with various other sherds of Claudian date. Slayhills. See also Fig. 2, Nos. 1, 3-5.
9. Squeeze of grey clay with white, grit chips bearing fingered impression. This is clearly an example of prepared clay as used in the manufacture of "combed" and other local wares. The object has been thoroughly fired and may have served as a kiln pad. Milfordhope. Unstratified.
10. Base of olla of hard, grey ware with small quantities of white grit in the paste. The fragment is twisted, and overfired. An irrefutable waster. Slayhills. Unstratified. Probably early second century.
11. Small pot of hard grey, sandy ware with flat base and rising knob within. An example of uneven potting. Fabric similar to No. 4. Slayhills. Unstratified.

FIG. 2. WASTERS AND SIGNIFICANT POTTERY FROM SLAYHILLS AND MILFORDHOPE

1. Bead-rimmed olla of grey ware with white, grit chips, slightly polished at rim and on neck, ornamented on the body with vertical combing. The bead is slightly undercut and the base flat and thin. The lower body is marred by deep scoring and pitting where grit has become detached in firing. This olla is typical of a large number of vessels manufactured at both Slayhills and Milfordhope. (See Fig. 1, Nos. 8 and 9.) Pit "A." A.D. 50-70. *Rich. II*, Pl. XXIX, Nos. 135-136, p. 97ff. *Jewry Wall*, p. 127, Fig. 34, Nos. 10-14. A.D. 35-50, also p. 130, Fig. 35, No. 15.
2. Bulbous pot of grey ware with fine, white grit. The collar-neck is slightly everted and flattened on the upper surface. The vessel has two weak cordons below the neck and a flat base. The surface,

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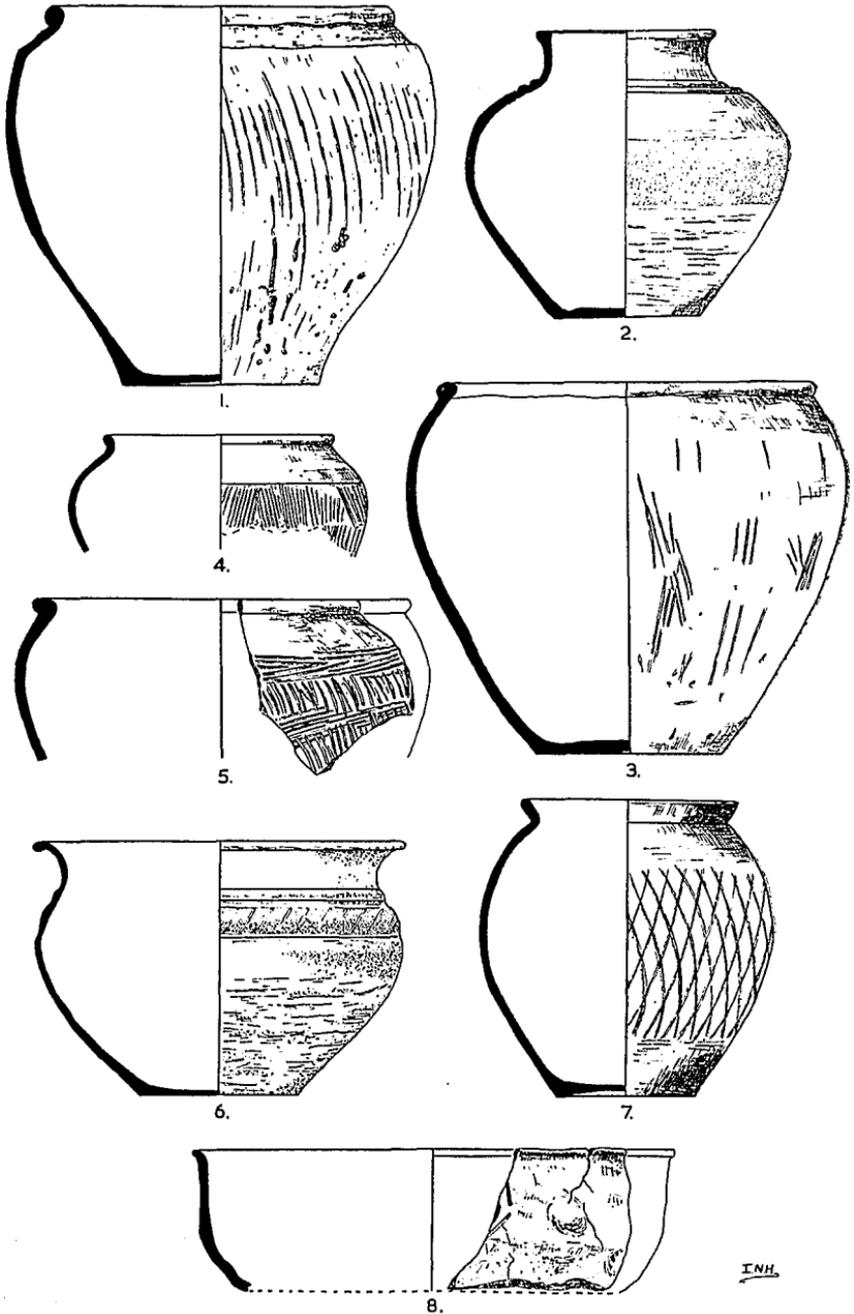


FIG. 2. Wasters and significant pottery from Slayhills and Milfordhope. (1/4)

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showing local oxidation, has been burnished leaving a sandy-surfaced median band by way of decoration. The base has flaked, possibly during firing. This vessel is Romanized but possesses pre-conquest affinities. Pit "A." A.D. 50-70.

3. Bead-rimmed olla of grey ware with white, grit chips. The pot which is locally oxidized on the exterior, is coated with a thin grey slip. Various cracks, and flaking at the base, are thought to have occurred during firing. The body is feebly combed. Pit "A." A.D. 50-70.
4. Rim and shoulder fragment from small bead-rimmed pot with fine, white grit, in the clay. The surface is grey, the core pink and the interior a blend of the two. The body is decorated with groups of combed lines. From Claudian deposit with bead-rimmed waster (Fig. 1, No. 8). Slayhills.
5. Sherd from olla with rolled and flattened rim. Ware grey with white, grit chips. The fragment illustrates the use of lateral and vertical combing. Slayhills. Unstratified.
6. Bowl of hard, grey, sandy ware with rim everted and smoothed beneath. There is a narrow and a wide cordon at the shoulder, the latter decorated with diagonal polished lines. The body incurves to a flat base and is intermittently burnished, thus achieving a silvery, metallic surface. (See waster, Fig. 1, No. 7.) Pit "B." A.D. 90-120.
7. Beaker of hard, grey ware with thick, slightly everted rim and gently rising base. The vessel is coated with a fine, silvery slip which has become detached in areas of local oxidation. The body is decorated with vertical hatching, and is marred by violent blistering at the shoulder. A true waster. Pit "B." A.D. 90-120.
8. Fragment of bowl of hard, brown ware marred by grass impressions. The surface, both interior and exterior, is extremely uneven and the rim has split in firing. Other small cracks are present on the body. The sherd is representative of a number of crude bowls of this type from Slayhills. Unstratified.

FIG. 3. WASTERS IN THE BRITISH, ROCHESTER AND MAIDSTONE MUSEUMS

Unless otherwise stated the following vessels are merely known to have been found on the Upchurch Marshes, no further details being available. It should, however, be borne in mind that the majority were recovered at a time when Otterham Creek was the principal source of finds. The drawings illustrate types and are not records of the wasters themselves, as many of these are too mis-shapen to be helpful.

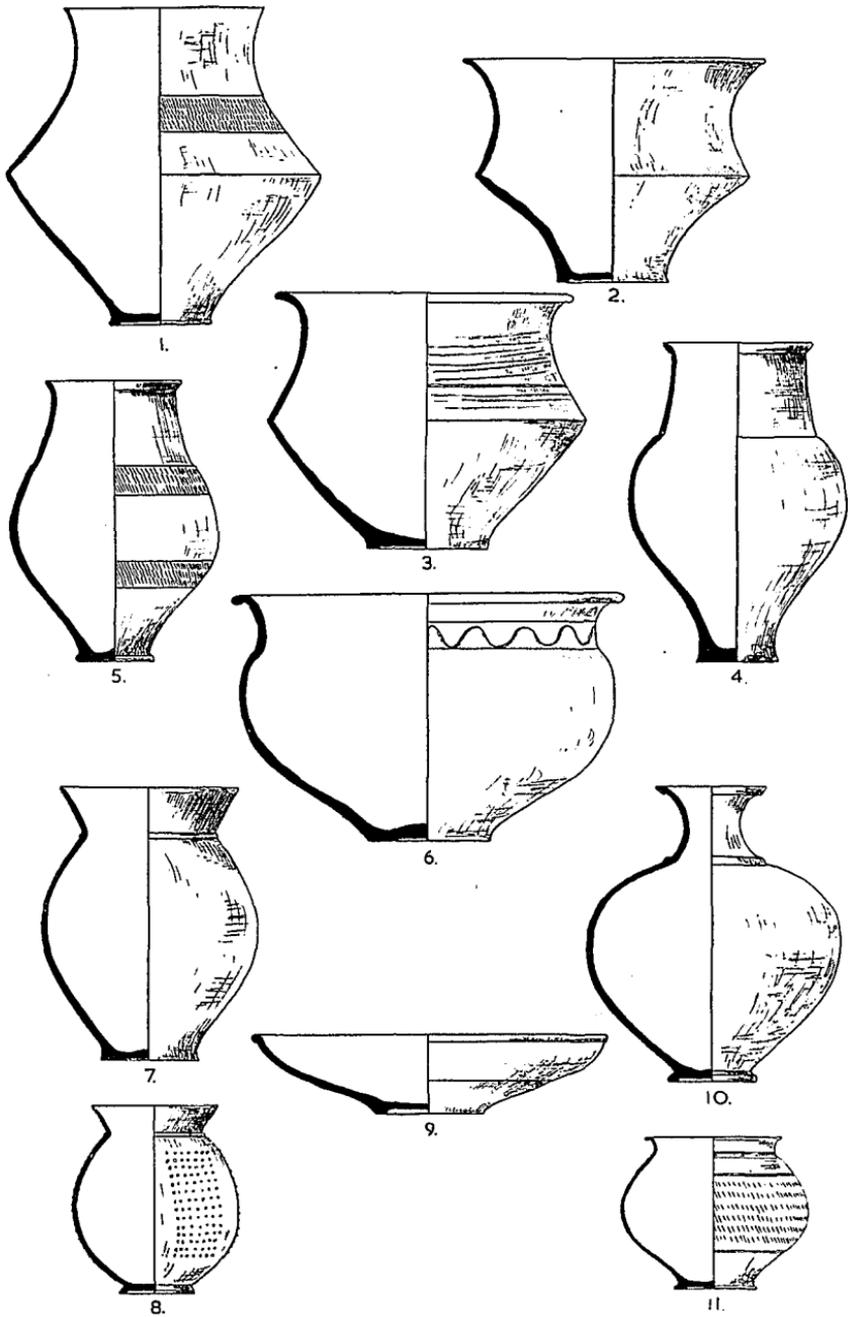


FIG. 3. Relevant wasters in museum collections. (2)

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1. Carinated beaker of grey, bitumen-varnished ware with moulded foot and decorated on the upper conical segment with a zone of rouletting within two light grooves. The pot is badly split at the lip. Brit. Mus. Mantell Collection, M.2700. Flavian. *B.M. Guide*, Pl. XII, No. 7. *Rich. III*, Pl. XXXVIII, Nos. 291 and 292. Intact beakers of this type have been found at Slayhills.
2. Carinated beaker of grey ware with brownish slip. The vessel has no foot-ring but possesses a slightly raised disc beneath. The waster, blistered and breached below the body angle, was found by Payne on the bank of Otterham Creek. Brit. Mus. No. 83, 12-13, 433. Early second century.
3. Carinated beaker of grey ware burnished on the exterior and on the internal lip of the rim. Burnishing on many vessels of this type and on poppy-head beaker forms may result in a surface blending from grey to light brown. The waster is squeezed, in the upper segment, into an ellipse and is blistered above and below the body angle. Maidstone Museum. Wickham Collection. 5 Vc. 8. First quarter of second century. *Rich. I*, Pl. XXVI, Nos. 75-77.
4. Bulbous beaker of grey, burnished ware with tall neck and sharply everted rim. There is an offset at the shoulder and the body tapers below the bulge to a thick, flat base. The waster is blistered on the shoulder and at the base. Found 1868. Rochester Museum. No. 196. A third-fourth century type.
5. Bulbous beaker of grey ware, oxidized in patches, with a tall neck and an everted rim. There is a slight offset at the shoulder and directly beneath it, a rouletted zone. A similar zone encircles the body towards the base. The beaker terminates in a well-formed foot-ring within which the base is slightly raised and projects internally. The surface bears traces of burnishing. The waster is squeezed inwards at the neck. Rochester Museum. No. 125. A third century form.
6. Wide-mouthed cooking-pot of grey-ware, locally oxidized, with outswept rim and a collar above the shoulder decorated with a single, wavy line. The vessel sags to one side and is blistered on the rim and body. This is a shape common on the marsh sites ; but the waster was found at Hartlip, where there was a notable Roman villa. Rochester Museum. A.D. 90-125.
7. Poppy-head beaker of grey ware with polished surface toning from grey to brown. The widely flared rim terminates in a cordon and the body is without the usual barbotine studded decoration. The base is well potted and rises slightly. The rim and upper body of the waster have been distorted inwards. Found 1830. Rochester Museum. No. 311. Mid-second century.

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A similar vessel to the above in the Payne Collection (Brit. Mus.) has flaked at the base, a blemish that might have occurred in firing.

Poppy-head beakers are not common at either Milfordhope or Slayhills, although a blistered rim fragment has been recovered from the latter site. (Not illustrated.)

8. Small poppy-head beaker of grey ware with dark, polished surface and decorated on the body with rectangular panels of applied clay studs. The beaker has a finely moulded foot-ring within which the base rises. The vessel is blistered at the rim but could have served as a "second." Rochester Museum. A.D. 90-125.
9. Dish of grey ware polished internally, slightly waisted, with bead rim and base raised within a ring. The rim is distorted but the dish might still have been used as a "second." Rochester Museum. Woodruff Collection, No. 291. Early second century. Dishes of various types are common at Slayhills but are rare at Milfordhope. Those recovered vary from dark grey with bitumen varnish to a pale, burnished grey. As a rule foot-rings are well formed, although differing in design, and rims vary from undercut beads to those that are flat and everted.
10. Bulbous flask of pink ware with sharply cut mouth and a pronounced cordon at the shoulder. The base rises within a well-cut foot-ring. The waster is badly blistered. Rochester Museum. No. 605. Belgic type flasks were well represented among the finds from the Roman cemetery at Ospringe and there dated from A.D. 100 to 200. However, the well-shaped mouth and the finely turned foot-ring of this example suggests a date in the first four decades of the second century. Flasks of this and Ospringe types are common at Slayhills, but are generally of grey bitumen-varnished ware. A sherd from one such vessel was reburied at a comparatively low temperature in an oxidizing atmosphere. The clay turned pink and the bitumen purple, indicating that both grey and reddish wares could emanate from the same kiln, the colour depending purely on atmosphere. *Ospringe*, Nos, 315, 318, 352, 395, 415, 427, etc.
11. Small pot of sandy, pink ware with everted and undercut rim, foot-ring and slightly raised base. There are two grooves below the neck and the body is decorated with multiple rouletting between two incised lines. The waster is badly blistered at the shoulder. Rochester Museum. No. 687. Late first to early second century.

ABBREVIATIONS USED IN REFERENCES

Arch. Cant.—*Archaeologia Cantiana*.

B.M. Guide—British Museum Guide to the *Antiquities of Roman Britain*, 1922.

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- Coll. Ant.*—C. Roach Smith, *Collectanea Antiqua* (7 vols. 1848-80), 1868.
Coll. Cant.—G. Payne, *Collectanea Cantiana*, 1893.
Jewry Wall—K. M. Kenyon, Society of Antiquaries Research Report on the Excavations at the Jewry Wall Site, Leicester, 1948.
J.R.S.—*Journal of Roman Studies*, 1953.
Ospringe—W. Whiting and W. Hawley, Society of Antiquaries Research Report on the Excavation of the Roman Cemetery at Ospringe, Kent, 1931.
Pro. Soc. Ant.—*Proceedings of the Society of Antiquaries*, 2nd Series.
Rich. I, II, III.—J. P. Bushe-Fox, *First, Second and Third Report on the Excavation of the Roman Fort at Richborough, Kent*, Society of Antiquaries Research Reports, 1926, 1928, 1932.
Silchester.—T. May, *The Pottery found at Silchester*, 1916.
V.C.H.—*Victoria County History of Kent*, Vol. III, 1932.

APPENDIX I

EXPERIMENTS WITH CLAY SAMPLES

Clay specimens removed from the bed of pit "B" were tested in the hope that they would support the theory that the pits had been dug to obtain clay for use in the manufacture of local wares. The samples were submitted to Mr. A. Markes, of the Avoncroft Pottery, Stoke Prior, Worcestershire, who very kindly provided the following information.

"The present colour of the clay, dirty grey, is no doubt due to the presence of carbonaceous matter. There are many clays of this colour all being classed under the heading of secondary clays. On heating the samples to a temperature of about 500°C., the carbonaceous matter was burnt out and the colour changed to red (due to the presence of iron oxide in the clay)."

Mr. Markes then fired samples at various temperatures with the following results :

Sample I. Fired in an open oven at approx. 700°C.

Atmosphere : oxidation. Result : very soft biscuit.

Sample II. Fired in an electric kiln at approx. 1020°C.

Atmosphere : oxidation. Result : hard biscuit.

Sample III. Fired in an open fire at approx. 1200°C.

Atmosphere : reduction. Result : clay on the verge of collapse.

On the strength of these tests Mr. Markes states that Romano-British wares made from this clay were fired at a temperature of between 950° and 1000°C. He also examined various sherds typical of the suggested local products and on these he made the following observations.

"The reason that some of the samples are mottled is due to the fact that all early kilns were crude and were probably rebuilt after each firing. That they were often inadequately sealed can be seen by the large number of dunted pots. If a draught of air had blown in during the early stages of cooling, it could have caused local oxidation on reduced pots. Conversely, if when packing the kilns, mats of gorse,

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broom, etc., were placed between the piles of pots, a mottled effect could be created by reduction on an oxidized pot. One of my tests was to fire a fragment of black ware in an oxidizing atmosphere (500°-550°C.). The fragment turned red which, I feel, proves that atmosphere and not temperature controls the colour. (This is only true of the temperature ranges under discussion : 500°-1200°C.)."

An oxidized sherd with multiple cracking of the fabric was among those examined by Mr. Markes. He considered that "the cracking was due either to the pot being fired while still damp or to the temperature being raised too quickly in the early stages of firing".

APPENDIX II

A NOTE ON THE FRAGMENT OF VITRIFIED BRIQUETAGE FROM MILFORDHOPE

The following tentative suggestion has been contributed by Mr. B. Butterworth, B.Sc., A.R.I.C., Building Research Station, D.S.I.R., and Mr. L. Biek, B.Sc., A.I.I.C., Ancient Monuments Laboratory, Ministry of Works.

The fragment seems to be a clay material which has been fired, in general, to a moderate extent, and whose surface has been melted by local overheating. One would have expected the body of the fragment to be better fired in view of the temperature to which the molten part must have been raised, but it is not impossible that the outside had a short period of intense heat, enough to melt the surface but not enough to make a more definite impression on the body. The presence of green material on both large surfaces could be explained by assuming that a kiln or similar structure was either repaired or relined with a layer of clay about the thickness of the fragment. This may have adhered to a surface, already similarly relined and then fired, with an appearance much the same as that of the fragment. When, at some time after firing, the fragment became detached, it brought down with it part of the previous surface which was essentially similar to its own.

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It remains to say that map references to the sites, and the relative wasters and pottery and clay samples fired by Mr. Markes and the writer have been deposited in Maidstone Museum.