THE EXCAVATION OF A ROMANO-BRITISH POTTERY KILN SITE NEAR HEDGERLEY

BY

KENNETH P. OAKLEY, C. E. VULLIAMY,
E. CLIVE ROUSE, F.S.A., and F. COTTRILL, M.A.

INTRODUCTION

The site which is the subject of this paper was first discovered by Mr. C. E. Vulliamy in the spring of 1934. He noticed extensive rabbit burrows in the middle of a ploughed field south of Wapsey's Wood, formerly part of the Bulstrode Estate. The earth thrown out was very dark in colour, and of a fine texture in contrast to the surrounding soil; and the surface, within an area of some 50 sq. yards round the burrows, was plentifully strewn with small sherds of pottery, which he was able to identify as Roman, some spread by the plough and mostly weathered. Other sherds were recovered from the actual upcast from the burrows, in good condition. This all suggested a considerable source of pottery and other material quite near the surface. Mr. Vulliamy kindly informed me of his discovery; and a close examination revealed the fact that the pottery was probably of 2nd century date.

It was clear that the site should be investigated; and an informal committee was formed, I being asked to take charge of the arrangements. In the summer and autumn of 1934 a preliminary excavation was carried out, mainly with a view to ascertaining the nature and extent of the site. Our member, Mr. G. H. Jack, kindly undertook to oversee the initial work, assisted by Mr. Vulliamy, Mr. A. E. Relph, and other helpers, the necessary funds for a certain amount of paid labour being raised by contributions from the excavators themselves and a few interested friends. Mr. R. Watson, the owner of the land, and Mr. Glennister, of Moat Farm, very kindly gave us every facility throughout.

A number of trial trenches were cut, and two excavations started. Everywhere black soil was encountered almost on the surface, the whole being thickly interspersed with sherds of a variety of wares, which increased in size as the excavations were deepened. The frequent occurrence of 'wasters,' blocks of 'vitrified' clay debris, charcoal, and finally traces of clay both yellow (unburnt) and red (burnt), left no doubt that we were dealing with a pottery kiln site. During the first season a vast quantity of sherds was accumulated and sorted; and a filled-in rubbish-dump, or more likely a stoking-pit, some 4ft. deep, was excavated. The kiln to which this pit was related was never located, and had probably been destroyed. From near the bottom of this pit came much hard blue 'vitrified' clay—the debris of kiln furniture as appears by analogy with later finds. There were also two fragments of interesting ware—a bowl of grey ware of finer texture than anything else found, apparently based on the Samian Form 46 (pl. X, 14); and a small carinated cup (pl. IX, 4). All these excavations were carried out to the north of the 1935 work (see map) except a trial-hole which revealed a clay floor and part of a kiln, apparently straight-sided, and a block of 'vitrified' clay shown on the general plan of the excavations.

During 1935 the main excavation was carried out; the work being done under the direction of our member, Mr. K. P. Oakley. Interim reports of the excavation have appeared in the *Records of Bucks*, xiii, pp. 60-61 (1934); xiii, p. 143 (1935); and xiii, pp. 191-4 (1936, by K. P. Oakley); and *Journal of Roman Studies*, xxvi, p. 259 (1936).

It was necessary to raise both money and assistance; and the Committee has many friends to thank in both respects, special thanks being due to Mr. C. E. Vulliamy, our member Prof. W. Wright, Mr. A. E. Relph, Mr. F. A. Lea and Mr. T. P. Oakley. Particularly generous donations from Mr. Richmond Watson, the owner of the land (in addition to his permission to dig and his kindness in fencing the site for us), our member Mr. R. H. Trench, the

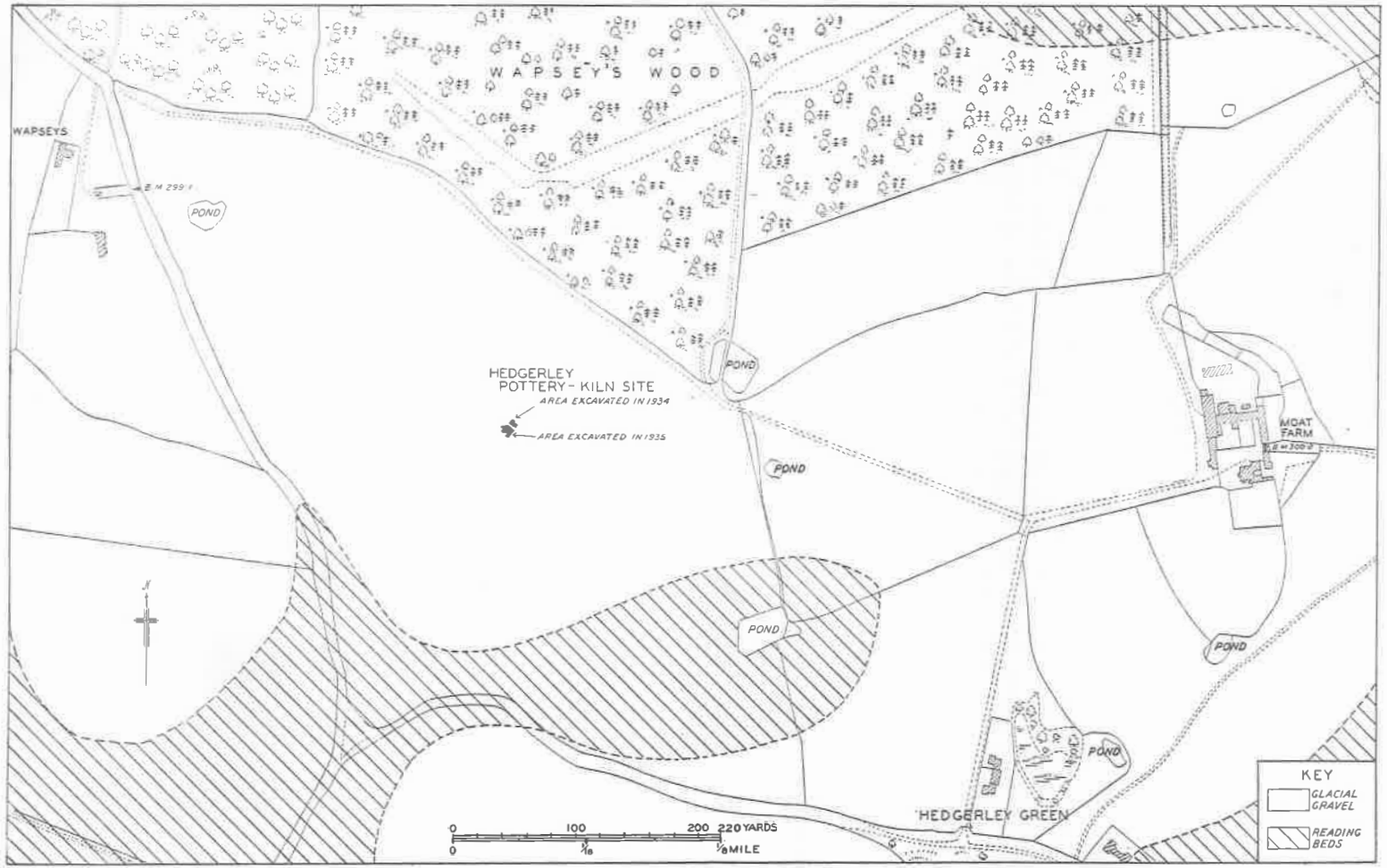
Chiltern Arts Club and others, not only paid for labour on the site, but also provided funds which enabled much of the best pottery to be mended and restored, and adequate drawings, plans, sections and photographs to be prepared. For assistance in surveying the site we have to thank Mr. Alec Dykes; and for photographs we are indebted to The Air Ministry, Mr. C. E. Vulliamy, Mr. A. Tidy, Mr. F. Coston Taylor, Mr. John Hill and Dr. C. A. Mitchell. Our thanks are also due to Mr. J. C. Maby for identifying the charcoals, to Dr. C. Davis Pryce for reporting on the fragments of Samian ware, and to the Misses Delia Parker and Ione Gedye for their work in restoring the pottery; while we gladly acknowledge the interest taken and advice given by Dr. R. E. Mortimer Wheeler, and for the facilities he allowed us at the London Museum, and subsequently at the Institute of Archaeology. We are grateful to Dr. W. F. Grimes, and Dr. N. Davey, for helpful discussion on various points; and finally, we must thank Mr. F. Cottrill for so kindly undertaking to prepare the report on the pottery.

The valuable results that the kindness and generosity of our members and friends have made possible have added an important chapter to our knowledge of Roman Buckinghamshire.

E. Clive Rouse.

General Survey

The Hedgerley pottery kilns were found clustered together on the highest part of the large field lying to the south of Wapsey's Wood, about half a mile (0.9km) north of Hedgerley Church, and two miles (3.2km) south-east of Beaconsfield. They were situated on a thin spread of Glacial Gravels, overlying Reading Beds (see map), at an elevation of 300 feet above O.D. The site lies in the fork of two dry valleys which fall south-eastwards and join the head of the Alder Bourne, a small stream entering the Colne below Uxbridge.



GEOLOGICAL MAP SHOWING THE SITE OF THE ROMANO-BRITISH POTTERY KILNS, NEAR HEDGERLEY.

(Based on Ordnance and Geological Surveys with sanction of H.M. Stationery Office.)

Little can be said of the historical setting of this small pottery-factory, which, from the evidence of the pottery obtained during the excavations, appears to have been established early in the second quarter of the 2nd century, and to have been in production until some time in the third quarter of that century (*i.e.*, roughly 130-170 A.D.). Some of the pottery reveals the persistence of a strong Belgic tradition in spite of over a century of Romanization. Early Iron Age culture, of course, had been established in this district for some centuries before the Roman occupation. The prehistoric ring-work known as Bulstrode Camp, lying a little over a mile to the east, has yielded pottery indicative of both Iron age A, and Iron age C (Belgic) occupation (C. Fox, and L. C. G. Clark, *Rec. Bucks*, xi, 1924, pp. 283-8; Hawkes *Antiquity*, v. 1931, p. 95).

The kiln site is not close to any known Romano-British settlement. A second-century coin-hoard was recently found at Chalfont St. Giles, 3 miles to the north (*Rec. Bucks* xiii, 1934, p. 60), but this does not necessarily connote permanent occupation. There was a country-house of some importance at High Wycombe, 7 miles to the W.N.W. (*V.C.H. Bucks*, ii, pp. 17-19), and a large farmstead at Chenies, 7 miles to the N.N.E. (*Hist. Mon. Com. Bucks*, i, pp. 9-10, ii, p. 88). Both appear to have been inhabited during the 2nd century A.D. There also appears to have been a more or less contemporary settlement of permanent character at Iver, 5 miles to the S.E., to judge by the discovery in this neighbourhood of a rotary-quern, of apparently second-century type (Curwen, *Antiquity*, 1937, p. 143, fig. 17), and the occurrence of Roman tiles in the tower of Iver Church. There was, however, no Roman town within twenty miles of Hedgerley. It is natural to ask, then, what sort of market was found for the products of the Hedgerley kilns. The comparative remoteness of the site, together with the small scale on which the industry was carried out, makes it seem most unlikely that the pottery was being produced for an urban market. For one thing, to reach the nearest highway

would have meant a trek of at least fifteen miles across undeveloped country. Most probably a local industry such as this would be designed to meet the needs of a scattered rural population without ready means of access to towns. Doubtless there were many small-scale farming establishments in the district, the sites of which await discovery, and it may be readily imagined that the pottery was hawked round amongst such local farmsteads. The general absence of coins on rural pottery-sites has given rise to the suggestion (Kendrick and Hawkes, *Archaeology in England and Wales, 1914-31*, p. 276) that this sort of trade was largely carried on by barter.

An air-photograph of the area showed no trace of any habitation-site in proximity to the kilns. Indeed, it is possible that the potters lived at some distance from the site. Probably the kilns would only have been used from time to time, perhaps seasonally. The orientation of the kilns suggests that they were designed for use when the prevailing wind had an easterly component, rather than a westerly one (*i.e.*, during dry weather).

All the essential requisites for pottery-making were at hand. Under natural conditions the area would be lightly wooded, and brushwood for fuel would consequently have been readily obtainable. The local Reading Beds provided suitable clay for the making of coarse wares and for the construction of the kilns, while water would have been obtained from nearby ponds.

Romano-British pottery-kilns were usually constructed as close as possible to a place where clay was readily accessible, but it appears that the nearest natural exposure of clay was nearly 200 yards from the Hedgerley kilns. It is just possible that the clay was reached by digging through the Glacial Gravel, which is quite thin in places. There are several ponds at no great distance from the site (see map), and at least one of these may mark the place where raw clay for the Hedgerley industry was extracted. The most probable site of the clay-pit is the pond in the south-east corner of the field, 250 yards from the kilns, since this is actually situated on the outcrop of clay. There is a

depression in the field immediately below the kiln site on the west, but this appears to be too large to be other than entirely natural. It may be mentioned that in more recent times the Reading clays exposed at Hedgerley itself have been dug for the making of bricks (Prestwich, *Quart. Journ. Geol. Soc.*, vi, 1850, p. 268), and at the present day they are worked for the manufacture of flower-pots.

Some interest attaches to the comparatively early date of the Hedgerley kilns since the majority of the rural pottery kilns which have been excavated in S. Britain belong to the period of economic revival of the late 3rd and early 4th centuries A.D. The half century or so during which the Hedgerley kilns were in production was the period of maximum economic prosperity in Roman Britain. It may be noted that there were no indications that the kilns had been suddenly abandoned, but rather that they gradually fell into disuse.

Only one other pottery kiln is known in Bucks, namely at Stone (*Hist. Mon. Com. Bucks*, i, p. 290), but nothing is known of its form or date. Several are known in neighbouring counties; two having been found at Radlett (*V.C.H. Herts*, iv, pp. 159-162), and one at Garston, near Watford, in Hertfordshire, (Davey, *Trans. Herts, Architect, Arch. Soc.* 1932, pp. 212-4), and two at Compton, near Newbury, in Berkshire (Harris, *Berks. Arch. Journ.* xxxix, 1935, pp. 93-95; Hardy, *Trans. Newbury Dist. Field Club*, vii, 1936, pp. 211 ff). One of these latter has been bodily removed and set up in the Children's Gallery at the Science Museum, South Kensington.

The 1935 Excavations at Hedgerley

In the time available for systematic excavation—consisting of short spells during the summer of 1935—it was only possible to explore a selected area of the site. The selection proved to be a fortunate one; the basements of two kilns and their respective stoking-pits, together with traces of another kiln and two ovens, were found within the small area chosen for excavation (general plan). Traces of a third kiln were apparent in

the south-east corner of the area, but this appeared to have been largely destroyed; neither time nor funds were available for complete investigation of its structure in 1935.

The Form of the Kilns; Methods of Firing

The two main kilns (Nos. 1 and 2) were of the oval, updraught type (Grimes, *Y Cymmrodor*, xli, 1930, p. 53[1]), each having a clay-lined combustion-chamber constructed below ground level, and a long clay fire-tunnel leading from the adjacent stoking pit. In each case the fire-hole faced approximately eastwards. Updraught kilns normally consist of two superimposed chambers: a basement or combustion-chamber, in which the fuel was burnt, and an upper chamber or oven on which the pottery was stacked, the two being separated by a raised floor of clay pierced by vent-holes. The raised floor in such kilns was usually constructed at or near ground-level, a position which facilitated the processes of setting and drawing the pottery. The floor was generally supported in one of three ways:—(1) by a central pedestal of clay (*e.g.*, in one of the Radlett kilns, *V.C.H., Herts*, iv, p. 160); (2) by a tongue-like column of clay extending from the back wall of the combustion chamber (*e.g.* in the second kiln at Radlett, *V.C.H. Herts*, iv., p. 161; and in the Compton kiln); or (3) by a series of clay pilasters lining the inside of the combustion chamber (*e.g.*, in some of the New Forest pottery-kilns; Grimes, *op. cit.*, p. 55).

In neither of the kilns excavated at Hedgerley, however, was there the slightest evidence of their ever having had permanent raised floors. There were no extensive pieces of 'vitrified' clay pierced by vent-holes, such as one would expect to find if the floors had been broken up by natural or agricultural agencies, nor were there any clear indications of permanent floor-supports. Two small obconical blocks of 'vitrified' clay were found close to the internal wall of the combustion-chamber of Kiln 1, and at first sight it would be reasonable enough

1 This paper gives a comprehensive account of Romano-British pottery-kilns.

to suppose that these were pilasters for supporting a raised floor, but against this is the fact that they are barely 9 inches high. In addition to these, several large rectangular blocks of the same material were found on the site (pl. V, A).[2] These blocks clearly represent some form of kiln furniture; they would seem to be out of keeping with kilns having permanent raised floors. It is possible, therefore, that they were used to support temporary clay floors, which were destroyed after each firing (cf. Grimes, *op. cit.*, p. 56, footnote 1). There is the further possibility that there were no true oven floors at all in the Hedgerley kilns, and that the pottery was stacked at the back of the combustion-chamber on a scaffolding constructed of loose bricks. Dr. Grimes has pointed out to us that this method, although hitherto unknown in Romano-British kilns, is employed in modern kilns of the type used by rural potters for firing flower-pots, the bricks being arranged so that ample space is left for the circulation of the hot gases. If this be the true interpretation of the construction of the Hedgerley kilns, they would have something in common with the horizontal-draught kilns, in which there is but a single chamber with a fire at one end and a flue at the other, the hot air being drawn through the pottery stacked in the centre (*e.g.*, the Farnham kilns: Wade, *Antiq. Journ.* viii, pp. 488 ff.; Grimes, *op. cit.*, p. 60).

The contours of the basement floors of the Hedgerley kilns suggest that the actual fire was placed well forward. The deepest part of the combustion chamber is almost immediately below the inner end of the fire-tunnel (section AA'A"). The floor rises towards the back of the chamber and also towards the sides, leaving a shelf-like area on which the pottery could have been stacked. The burning fuel would have been confined to the 'pit' below the end of the fire-tunnel. It is notable that in Kiln 2 (section EE'E") the shelf-like area at the back of the combustion chamber was covered by a clay floor—a feature

2 Two or three fragments of these found in 1934 had clearly marked perforations or vents, as if to assist circulation of the gases.

[Photo by A. Tidy.

HEDGERLEY POTTERY KILN SITE.

unknown in the type of kiln which has an oven separated from the combustion-chamber by a raised floor. Then again, the high percentage of over-fired pots amongst the kiln debris is perhaps a further indication that the pottery was fired in the combustion-chamber.

Whether the kilns had raised ovens or not, they would certainly have been roofed over above ground. Whereas the combustion-chamber of a kiln was a more or less permanent structure, the part above ground would have been wholly or partially demolished each time the pottery was drawn, and reconstructed again before the next firing. The superstructure was probably a dome-shaped construction, the framework of which consisted of bent and interlocked boughs covered eventually by layers of grass and of raw clay. A vent would have been left at the summit of the dome to create the necessary draught required for the firing. Innumerable fragments of hardened clay packing, with impressions of grass, representing the demolished domes of the kilns, were found amongst the debris filling the stoking-pits (pl. V, c).

Details of the Construction of the Kilns

The basements of Kilns 1 and 2 had been constructed in steep-sided trenches dug in the natural sandy gravel subsoil, approximately 7 feet long, 4-5 feet wide, and 2-3 feet deep, and leading from shallow stoking-pits. The end of the trench away from the stoking-pit had in each case been enlarged to allow for the construction of an oval combustion chamber. The trenches had been lined with specially prepared (' pugged ') yellow clay, obtained from the local Reading Beds. The original walls of the oval combustion-chamber were only 3-4 inches thick, and those of the fire-tunnel about a foot thick. In both kilns, however, the walls of the combustion-chamber had been re-lined from time to time, with the result that, ultimately, they were nearly a foot thick in places, and the area of the firing chamber had been greatly reduced in consequence.

The ' pugged ' yellow clay with which the kilns had been built had of course been changed in colour wherever it had been raised to a high temperature. The colour to which it had burnt varied from light red, through dark purplish-red to bluish-black, depending partly on the temperature to which it had been raised, and partly on the extent of penetration of reducing gases. The clay walls of the fire-tunnel of Kiln 2 had been burnt blue-black on the inside; this zone was succeeded by clay burnt red, passing outwards into yellow unburnt clay. In Kiln 1 the walls of the fire-tunnel had apparently not been subjected to very intense heat, the clay of which they had been constructed being practically unburnt, except on the inner surface. In both kilns the walls of the combustion-chamber, however, had been burnt right through, being brick-red on the outside and blue-black (' vitrified ')[3] on the inside, where they had been in direct contact with the fire. In cross-sections of the walls, successive re-linings showed up as a series of blue-black zones, usually separated by zones of clay fired red.

KILN No. 1 (see detailed plan; sections AA′, BB′, CC′; and pl. II). In this kiln, the long axis ran approximately E—W. The combustion chamber was pear-shaped, narrowing towards the fire-tunnel, and about 5ft. 6ins. long, with a maximum width of 5 feet. The fire-pit had a maximum depth of 3ft. 6ins. from the original ground-surface. The shelf-like peripheral area, on which the walls stood, was approximately 1ft. 9ins. from the surface. The walls sloped inwards towards the bottom, and had slightly concave inner surfaces. They had been re-lined at least twice, and possibly three times. The first re-lining was confined to the southern side of the chamber. During the second renovation the

[3] The use of the term 'vitrified' for the hard, bluish-black fired clay throughout this paper perhaps requires qualification, since this material does *not* exhibit visible signs of fusion. Moreover clay may assume a bluish-black colour through being fired in a reducing atmosphere without necessarily being raised to a very high temperature. It may be that some of the bluish-black zones in the walls of Hedgerley Kilns were produced in that way, but certainly the clinker-like consistency of, for example, the loose bricks seems to imply incipient vitrification. The colour is due to the development of ferroso-ferric oxide.

GROUND LEVEL

PLOUGHED ZONE

INFILLING OF KILN NO. 1.

RESTORED OUTLINE OF ROOF OF FIRE-HOLE

MAINLY COLLAPSED CLAY

KILN DEBRIS

CHARCOAL

INFILLING OF STOKING PIT NO. 1.

CHARCOAL

OVEN A

SECTION OF LATERAL BRIDGE PROJECTED ON TO LINE OF LEVEL SECTION

SECTION THROUGH KILN NO. 1 CONNECTED STOKING PIT AND OVEN, ALONG LINE A A' A"

SECTION ACROSS KILN NO. 1 ALONG LINE B B'

GROUND LEVEL

PLOUGHED ZONE

INFILLING

COLLAPSED CLAY

KILN DEBRIS

BLOCK OF VITRIFIED CLAY

SECTION ACROSS KILN NO. 2 ALONG LINE D D'

PLOUGHED ZONE AND FILLING OF POST-ROMAN TRENCH

KILN DEBRIS IN OVEN B

OUTLINE OF VITRIFIED BLOCK PROJECTED ON TO LINE OF SECTION

KILN DEBRIS AND CHARCOAL

CHARCOAL

GRAVEL

SECTION ACROSS FIRE-HOLE OF KILN NO. 1. ALONG LINE C C'

GROUND LEVEL

POST-ROMAN TRENCH

RESTORED OUTLINE OF FIRE-HOLE

CHARCOAL - FILLED FIRE-HOLE

LOOSE BLOCKS OF VITRIFIED CLAY (HACHURE BROKEN WHERE STRUCTURES PROJECTED ON TO LINE OF SECTION)

VITRIFIED CLAY LINING OF KILN-WALL

CLAY BURNT RED (HACHURED WHERE LINE OBSCURE OR IN COLLAPSED CONDITION)

UNBURNT (YELLOW) CLAY

GRAVEL

0 1 2 FEET

BOUNDARIES PROJECTED ON TO LINE OF SECTION.

RESTORED LINES.

BROKEN MARGINS.

APPROXIMATE BOUNDARIES.

GROUND LEVEL

PLOUGHED ZONE AND FILLING OF POST-ROMAN TRENCH

RESTORED SECTION OF ROOF OF FIRE-HOLE

INFILLING

KILN-DEBRIS AND CHARCOAL

3FT.

PLOUGHED ZONE

INFILLING OF STOKING PIT NO. 2

CHARCOAL AND BROKEN POTS

SECTION THROUGH KILN NO. 2 AND CONNECTED STOKING PIT ALONG LINE E E' E'

PLAN OF OVEN A

(POSITIONS OF LOOSE BLOCKS OF VITRIFIED CLAY ONLY APPROXIMATE)

DETACHED PIECES OF MOULDING

FIRE-BAR

SECTION ACROSS FIRE-HOLE OF KILN NO. 2 ALONG LINE F F'

GROUND LEVEL

RESTORED OUTLINE OF FIRE-HOLE

FILLING OF POST-ROMAN TRENCH

COLLAPSED PORTION OF ROOF OF FIRE-HOLE

CHARCOAL

HEDGERLEY EXCAVATIONS 1935

DEL. K.P. OAKLEY.

SECTIONS AND DETAILED PLAN OF OVEN A.

1

[Photo by K. P. O.

2

[Photo by C. E. V.

HEDGERLEY: KILN No. 1.

whole of the interior had been re-lined, but this lining had largely broken away. On the northern side a mass of red clay had been plastered against it. This clay had included within it, near the top, the greater part of an overfired olla, (cf. pl. IX, 5), and near the bottom a conical block of 'vitrified' clay (see section BB'). In the absence of a definite 'vitrified' surface it was difficult to determine whether this wad of red clay represented an attempt to patch up the wall (*i.e.*, a third, partial, re-lining), or whether it was part of the mass of collapsed clay which occupied much of the interior of the combustion-chamber.

As already mentioned, two conical blocks of 'vitrified' clay were found on the floor of this kiln, both lying close against the walls of the combustion chamber. They were both about 9 inches high; the one had a maximum diameter of 6 inches, the other, of 8 inches. A roughly rectangular block of the same material was found resting against the inner wall, in the south-western corner of the kiln. It measured approximately 7ins. x 5ins. x 3ins. The walls of this kiln had been partly destroyed in two places by a shallow trench running obliquely across the kiln from N.W.—S.E. It was clearly post-Roman, and most probably a field drain. Although the back wall of the firing-chamber had been thus destroyed in the axial line of the kiln, there were clear indications that it was originally continuous, and not breached by a horizontal flue.

The fire-tunnel of the kiln, extending from the firing-chamber like the bonnet of a car, was about 2 feet long. The fire-hole was about 1ft.6ins. wide, and had almost vertical walls. In the front, the arched roof of the fire-hole had caved-in (pl. II, 1). The inner end of the fire-hole was filled with a mass of collapsed red clay, and it was difficult to draw an exact boundary between this and the originally solid walls of the kiln.

The floor of the fire-hole sloped down towards the fire-pit at an angle of 20°. The front part of the fire-hole was filled with black sooty earth containing numerous pieces of charred wood. Three nearly complete pots (section AA' A", and pl. IX, 2, 7, 8) were

found in the fire-hole, one being buried in the charcoal layer, and the other two resting on it. All three had been under-fired, and had partly reverted to clay. The largest pot was found to be almost completely filled with clay; this material had apparently worked its way in from the collapsed roof of the fire-hole, which immediately overlay the mouth of the pot.

The firing-chamber had been largely infilled with kiln debris. The bottom of this kiln, unlike that of Kiln 2, was practically clear of sooty material, but was littered with broken pots, most of which had been overfired, and in many cases contorted through direct contact with the fire.

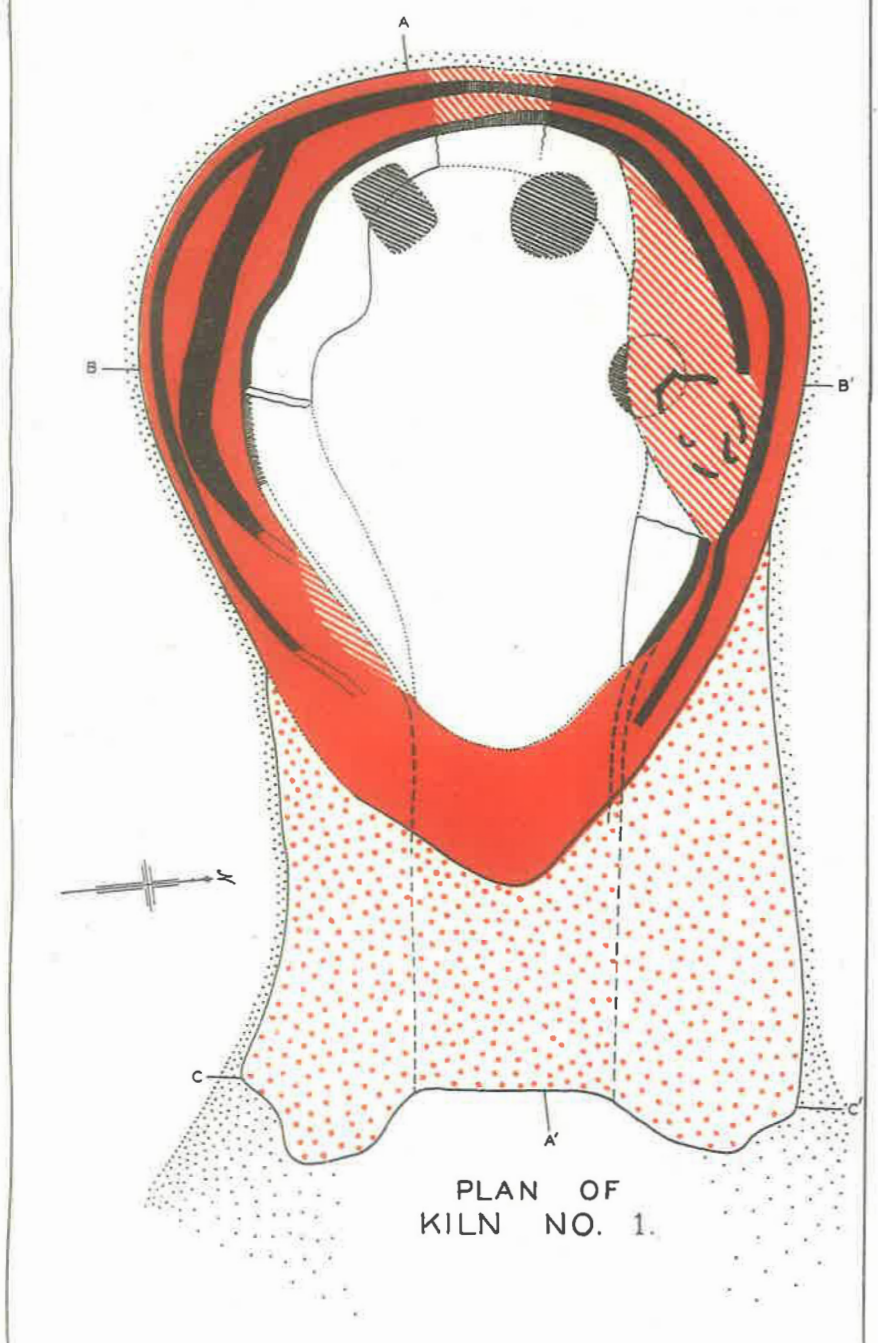
KILN No. 2 (see detailed plan; sections DD′, EE′, FF′; pls. I and III). The second kiln showed a number of peculiar features, one being its marked asymmetry compared with Kiln 1. It has an overall length of 6ft. 6ins., the combustion-chamber being about 4ft. 6ins. long, and with a maximum width of 4 feet. The long axis of the kiln ran E.N.E.—W.S.W., the fire-hole opening in a roughly easterly direction.

The firing-chamber was again pear-shaped in outline, but the fire-tunnel was so exceptionally wide that the two appeared to merge.

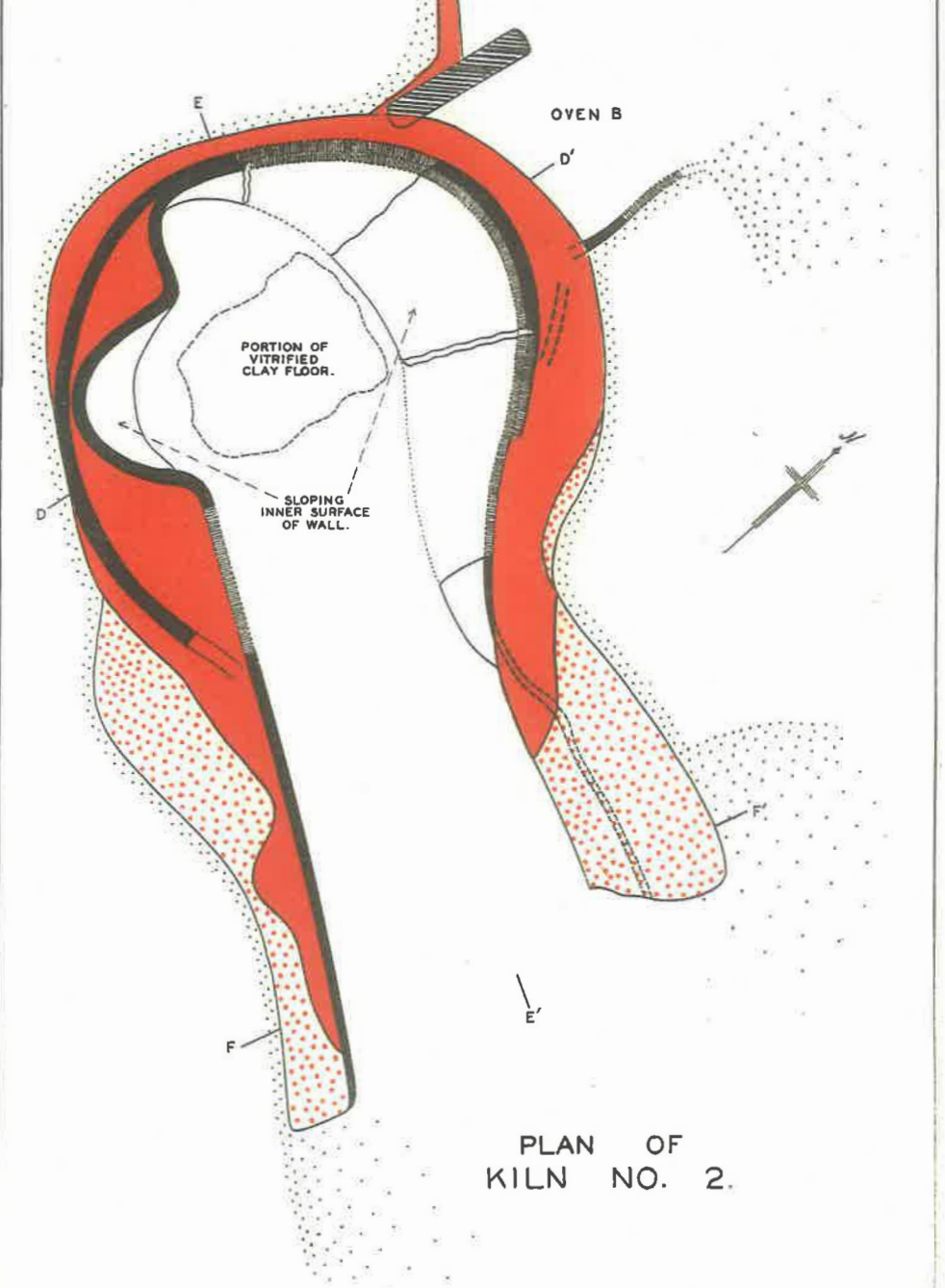
This kiln again showed indications of having been reconstructed more than once. Before filling in the excavations the walls of the kilns were partly demolished in the hope of finding datable potsherds in their make-up. At some distance below the top of the northern wall of the firing-chamber of Kiln 2, there appeared a portion of a 'vitrified' clay surface (shown by a dotted line in detailed plan, right). This was apparently all that remained of the original walling of the kiln; the two 'vitrified' layers seen in the southern wall would thus appear to represent re-linings.

During the second reconstruction the shape of the firing-chamber of this kiln had been radically altered. The southern wall had been greatly thickened at the front end, and again towards the back, so as to leave a

HEDGERLEY EXCAVATIONS 1935.



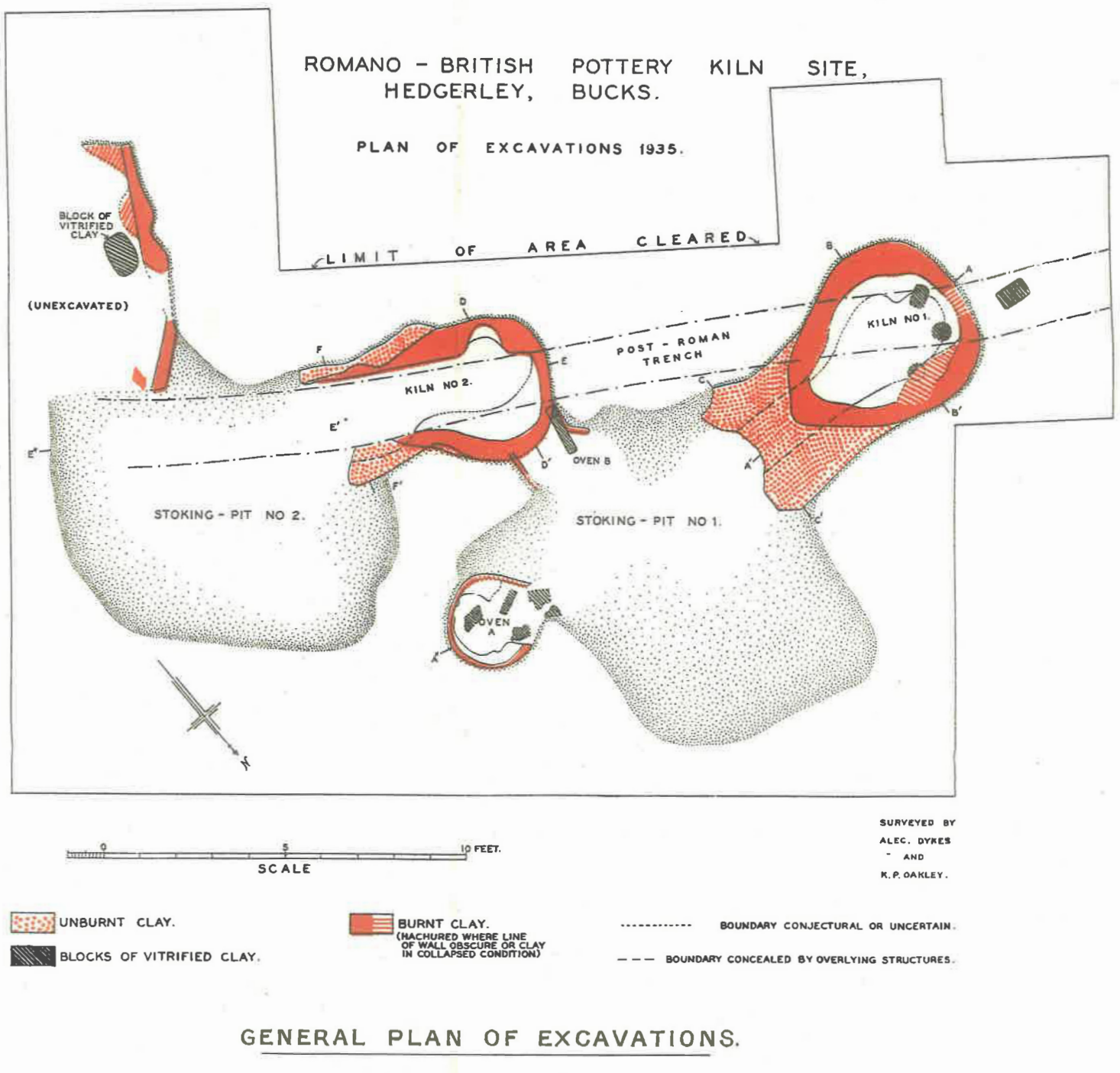
PLAN OF KILN NO. 1.



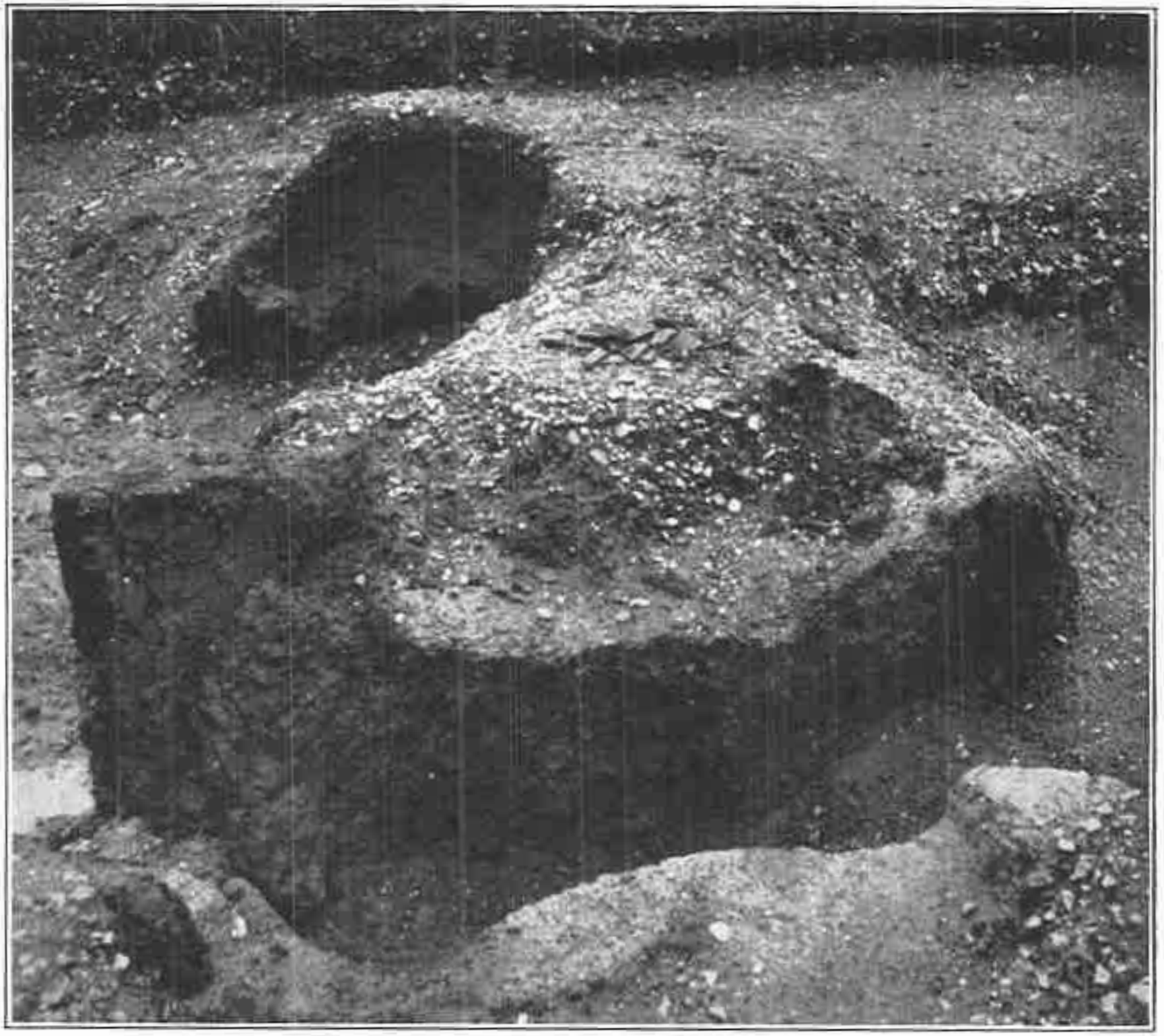
PLAN OF KILN NO. 2.

VITRIFIED CLAY (LOOSE BLOCKS).
UNBURNT (YELLOW) CLAY.
VITRIFIED CLAY LININGS OF KILN.
CLAY BURNT RED.
HACHURED WHERE LINE OF KILN WALL OBSCURE OR CLAY IN COLLAPSED CONDITION.
0 2 FEET.
---------- BOUNDARIES CONJECTURAL OR UNCERTAIN.
— — — BOUNDARES CONCEALED BY OVERLYING STRUCTURES.

DETAILED PLANS OF KILNS 1 & 2, AND OF OVEN B.



GENERAL PLAN OF EXCAVATIONS.



[Photo by J. Hill.

HEDGERLEY POTTERY KILN SITE.

steep-sided alcove in the middle section of the wall. There were no indications of a corresponding structure on the northern side. It might be suggested that the buttress-like thickenings of the southern wall were intended for the support of an oven floor, but the absence of a corresponding ledge or buttress on the other side of the kiln, is against this view. In any case there was no such provision for an oven floor at the time of the first reconstruction of the kiln. It seems more likely that it was the recess, between the thickened portions of the wall, which constituted the purposeful feature of the final reconstruction. If a vent had been left in the dome immediately above this recess, the latter would have tended to canalise the draught, an effect which may have been desirable for some reason or other. It may be pointed out that the thickening of the front part of the southern wall of the firing-chamber had brought it into line with the fire-tunnel.

In the north-western corner of the kiln an extensive piece of the penultimate 'vitrified' lining was exposed. It was preserved to a height of 2 feet above the floor of the firing-chamber. Directly in contact with it was part of the final lining (pl. III).

It appears that the shelf-like area at the back of the firing-chamber was originally floored with clay. Only a portion of this clay floor, which was in a ' vitrified ' condition, was found in place. Its contact with the underlying gravel was beyond all doubt original, so that there was no possibility of its being a collapsed portion of a raised oven-floor.

The fire-tunnel was just over 2 feet long, with a total width of 3ft. 6ins., and an interior diameter of 2 feet. The roof of the tunnel had been largely destroyed by the post-Roman trench, but a collapsed portion was found in the charcoal filling of the fire-hole. The fire-hole itself was originally a low, almost rectangular, arch.

Both the firing-chamber and the fire-hole were filled with black sooty earth. A few fragments of 'vitrified' brick were found in this material, but scarcely any pottery.

Kiln 2 appears to be of later construction than Kiln 1, since the trench in which it was built truncated the walls and charcoal filling of Oven B; and the latter, being connected with Stoking-pit 1, was presumably in use at the same time as Kiln 1 (see also p. 280).

The Stoking Pits

The pits connected with Kilns 1 and 2 were large and shallow (see general plan of excavations, and pl. IV, 2); they had shelving sides and narrowed towards the fire-holes. They varied in depth from 1ft. 6ins. to 2ft. Their floors sloped down in the direction of the fire-holes. The stoking-pit which was partly excavated in 1934 had a maximum depth of about 4 feet (see p. 253).

A layer of black sooty earth, about 6 inches thick and full of pieces of charred wood, lined the floor of each pit. Above this charcoal layer came about a foot of dark earth full of broken pots, 'wasters,' pieces of red clay, and thin slabs of the clay-packing which had been used in the construction of the domes of the kilns. This material, almost devoid of stratification, filled the pit up to the ploughed zone.

The abundance of pottery and charcoal in the filling of the two stoking-pits excavated in 1935, suggests that they had been filled intentionally, rather than by natural agencies. They may well have been used for the disposal of ashes and waste pottery, after the kilns with which they were connected had been abandoned in favour of new ones—for it seems unlikely that the two so far explored represent the total number of kilns on the site.

Drying Ovens

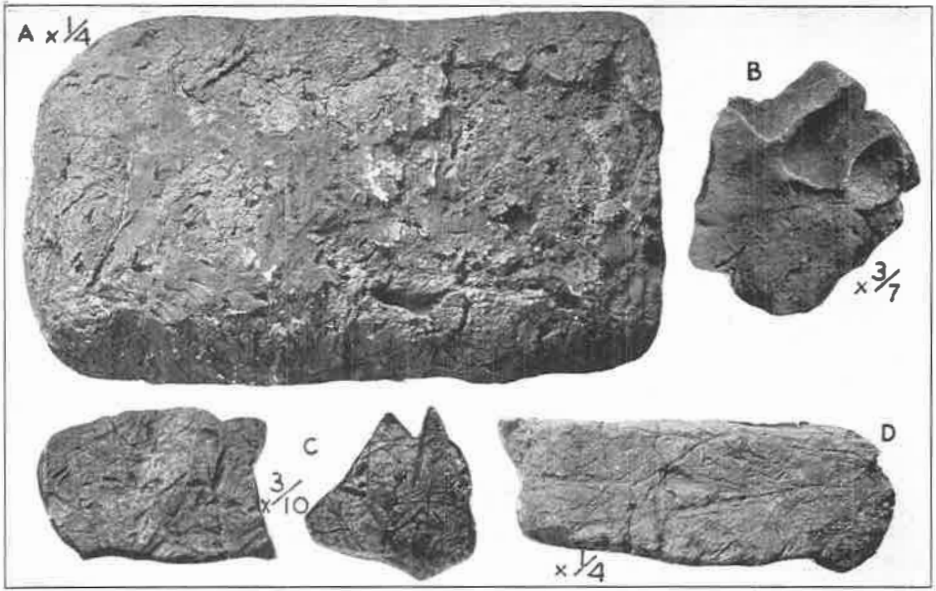
Oven A. (Pl. IV). The base of a small circular oven with vertical walls was found in the north-eastern corner of Stoking-pit 1. This oven had been constructed in a recess excavated in the natural gravel. It had a diameter of about 2ft. 6ins. The front and the greater part of one side had been destroyed, but the back was preserved to a height of 1ft. 6ins., and showed a slightly

1

2

[Photos by A. Tidy.

HEDGERLEY POTTERY KILN SITE.



MISCELLANIES FROM KILN AND OVEN DEBRIS.

concave inner surface. The clay walls were about 2 inches thick, and burnt red on the outside, and bluish-brown on the inside. The sandy-gravel in contact with the walls had also been reddened by the heat.

Towards the front of the oven there were remains of a solid bridge or platform of burnt clay, with a concave moulded inner margin and a flat upper surface. Originally this almost certainly crossed the front part of the oven, in which case it would have been breached in the mid-line by a horizontal flue. The back wall of the oven appears to have had a projecting, moulded foot. The oval space between the platform and the back wall was in all probability crossed by fire-bars as in a modern ' bucket-grate.' One of these bars was found in the debris which filled the interior of the oven (pl. V, D). The space below the fire-bars, assuming that our interpretation is correct, would have been only 3-4 inches high; it is probable therefore that fuel was burnt on the fire-bars as in a grate, and that the space below, which would have been connected to the exterior by a horizontal flue, was merely for the purpose of creating an upward draught. The oven was presumably closed in front by a pack of raw clay, and would have been roofed with a clay dome provided with a vent-hole. The slab of hardened clay, with spreading basal edge, which lay in two pieces close to the front, probably formed one of the cheeks of the oven.

It is thought that this oven, for which no exact Romano-British parallel can be quoted, was used for drying the finer wares before they were finally fired in the kilns. Clearly there was not room for both fire and pots in this small oven; it is possible, however, that the pots were placed inside after the fire had been drawn. They would thus have been rapidly dried out by the heat retained in the walls.

In order to minimise the risk of distortion of pots during the process of firing in the kilns, it is essential that they should first be thoroughly dried. Normally, the pots are left in the ' green ' state to dry in the air, but this is a relatively slow process, and it may be that

ovens of the sort here described were installed at Hedgerley to accelerate the preliminary drying, so as to increase the output of the plant.

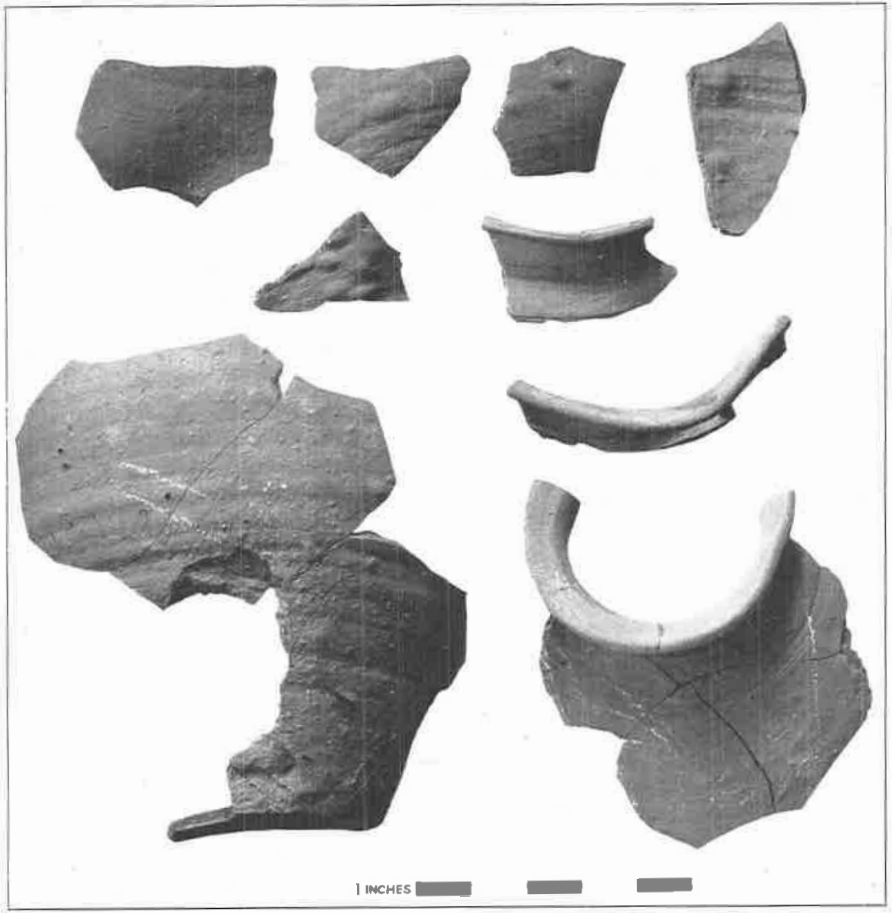
Oven B. (Pl. IV, 2, right; pl. VI; see also detailed plan of Kiln 2, and section DD′). During the excavation of Stoking-pit 1, a thick mass of black sooty earth, containing several broken pots, and other kiln debris, was found in the south-eastern corner, at the back of Kiln 2. This material was found to occupy a recess and appeared to extend underneath the wall of the kiln. The gravel walls of the recess were lined with burnt clay. At first it was thought that this structure represented the opening of a large horizontal flue connected with Kiln 2, but the excavation of the interior of that kiln showed that this was not the case; at any rate, not in the final form of the kiln, since the innermost lining of the wall was found to be continuous from top to bottom. The possibility that the kiln as originally built had such a flue cannot be entirely excluded, though its position would have been curiously asymmetrical. A section through the kiln-wall made it clear that it had in fact been built against, and partly on top of, the debris of an earlier structure; most probably it was another drying oven connected with Stoking-pit 1. The greater part of a large roll-rim jar (pl. X, 12), together with a large rectangular brick of 'vitrified' clay (pl. V, A), was found in the black earth of this presumed oven.

The Pottery (see also pp. 272-280).

Potsherds in prodigious quantity, including many 'wasters', occurred in the filling of the stoking pits, and also in the firing-chamber of Kiln 1. A few typical 'wasters' are illustrated in pl. VII. Five pots were sufficiently complete to make restoration possible, and these are illustrated in pl. VIII.

Mr. Cottrill's detailed study of the pottery on a comparative basis has shown that the time-range represented is shorter than was at first thought, the

HEDGERLEY: OVEN B. [Photo by J. Hill.



'WASTERS.'

earliest types on the site dating from the beginning of the second quarter of the second century, and not from the end of the first century as the preliminary review suggested.

The majority of the sherds found on the site no doubt represent rejected pots. It is therefore not surprising to find that much of the material is either overbaked or under-baked. Sherds belonging to the former category are distinguished by their blue-grey colour and by their hardness and metallic ring. The under-baked variety has undergone partial reversion to clay in many cases. This is to be attributed to the action of damp, aided perhaps by the acid character of the soil. It is notable that the broken pots found on the floor of Kiln 1 were all over-fired, while the three nearly complete pots in the fire-tunnel were under-fired.

Samian Ware

A few stray sherds of Samian Ware *(Terra sigillata)* were found in the infilling of Stoking-pit 1. They all occurred at the same level, about 1ft. 6ins. from the bottom.

Dr. C. Davies Pryce, F.S.A., has kindly examined them and reports as follows:—

"Form 33 (3 fragments). 2nd century, A.D.

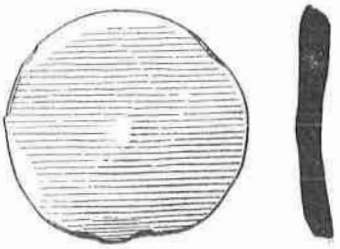
"Form 18/31 (1 fragment). This is the only fragment that is definitely helpful. It is, I think, Hadrianic—early Antonine (*circa* 130-150, A.D.)."

The presence of Samian on a site of this character is perhaps rather enigmatical. The fact that some of the pots made at Hedgerley were based on Samian forms, suggests the possibility that examples of this imported ware were brought to the factory to serve as models.

Other Finds

The only other finds were:—a small gaming-counter, made from a sherd of soft reddish-brown ware, found

in the filling of Stoking-pit 1; and part of an iron knife of normal Roman type, found in the surface soil.



GAMING COUNTER MADE FROM POTSHERD. 1/1.

Charcoals

Numerous short lengths of charred branches were found in the black sooty earth on the floors of the stoking-pits, and in the fire-holes of the kilns. 24 typical pieces were submitted to Mr. J. C. Maby, who reports as follows:—

"*Quercus robur* (Common Oak)—parts of small branches (15).

Fagus sylvatica (Beech)—parts of small branches or stems (4).

Corylus avellana (Hazel)—parts of small branches or stems (2).

Populus sp. (Poplar)—parts of small branches or stems (2).

"As far as one can judge from the structure, all the material appeared to be branch-wood (brushwood)."

None of the wood was large, the thickest branches of oak being 1.5 inches in diameter.

The presence of beech is worthy of note. In spite of Cæsar's assertion that *Fagus* was not to be found in Britain, there is no doubt that the beech is an indigenous tree. It probably reached this country at the beginning of the Atlantic period. Mr. Maby informs us that he has recorded beech from several pre-Roman and early Roman sites in Surrey and Sussex. Clarence

Druce *(Flora of Bucks*, 1926, p. 312) suggests that the *Fagus* mentioned in *De Bello Gallico* meant the chestnut and not the beech.

EXPLANATION OF PLATES I—X.

Plate I. General view of excavations at Hedgerley, looking west; Kiln 2 in foreground; Kiln 1 in background (half right).

Plate II. 1. Fire-hole of Kiln 1, with complete bowl (8) *in situ.*
2. Outline of firing-chamber of Kiln 1 as it appeared before the excavation of the interior.

Plate III. Kiln 2, showing partially excavated interior; Stoking-pit 2 on the right; Oven A in the background.

Plate IV. 1. Oven A, showing interior with fire-bar supports, etc.
2. General view of excavations, looking east; showing Stoking-pit 1, with Kiln 1 in foreground (right); and in middle distance, Oven A (left), and Oven B (right).

Plate V. A. Brick of 'vitrified' clay from interior of Oven B.
B. Piece of 'vitrified' clay showing finger-impressions; from Kiln 2.
C. Pieces of clay-packing (with impressions of grass) from a demolished kiln dome.
D. Fire-bar from Oven A.

Plate VI. Oven B (at back of Kiln 2), showing charcoal filling, and part of large roll-rim jar (12) *in situ.*

Plate VII. Sherds of over-fired pottery from the Hedgerley kilns, showing contortion and blistering.

Plate VIII. Selection of the more complete pots (restored) from the Hedgerley kiln site.

Plates IX-X. Drawings of pottery from the Hedgerley kiln site. The pots are referred to in the text by numbers, 1-21.

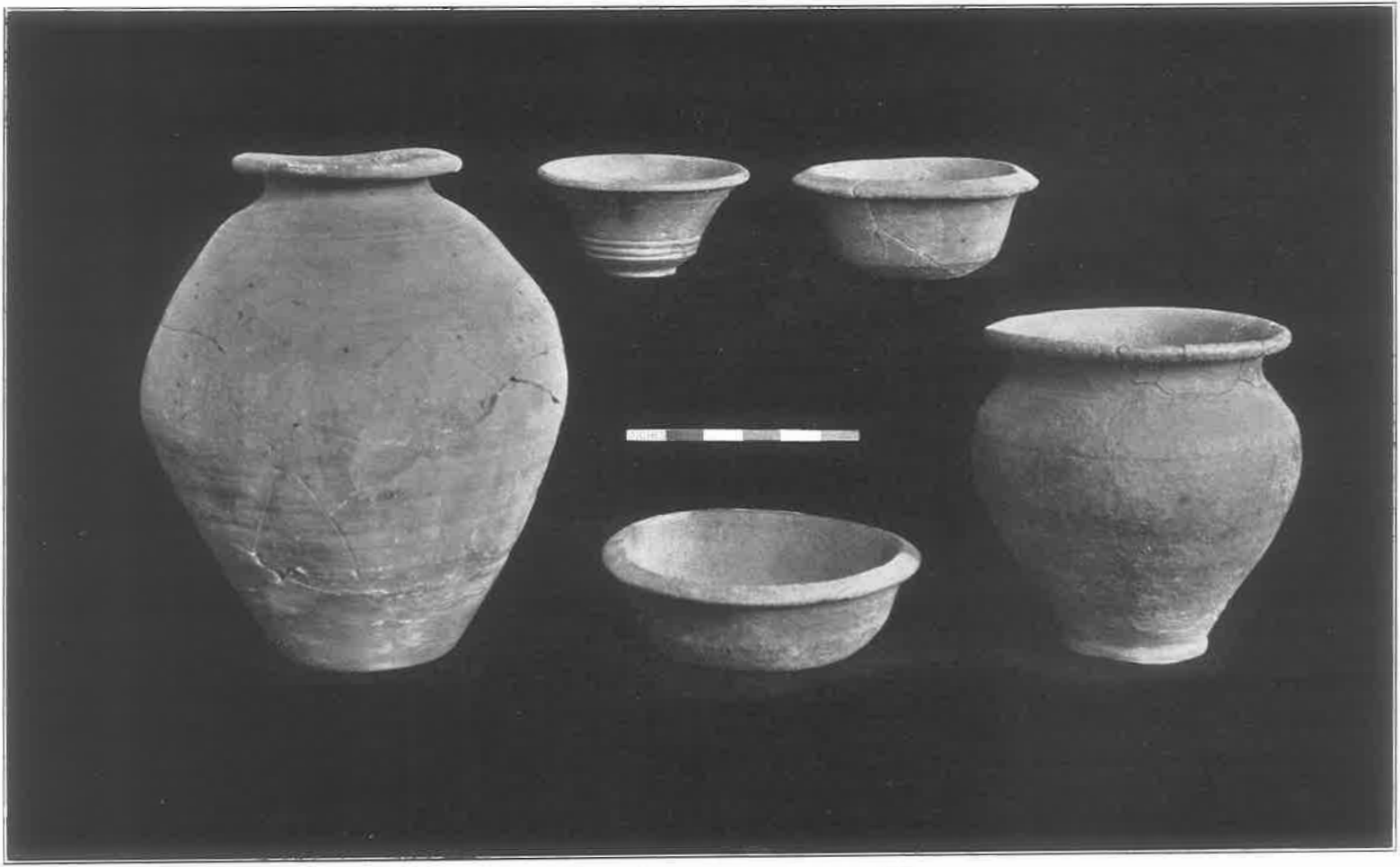
THE POTTERY FROM THE KILNS (Pls. VIII, IX and X).

BY

F. COTTRILL, M.A.

The products of the Hedgerley kilns found on the site mainly consist of jars (including both wide-mouthed and narrow-mouthed types), dishes (including many of the 'pie-dish' type), and bowls. Cups are less common, and a few other types, such as lids, colanders and beakers, are each represented by a few examples only. Jugs and mortaria are absent, although the spouted bowl (21) is probably imitated from a mortarium form. Types having a native pre-Roman origin predominate, more particularly among the jars (1-3, 11, 12, 16). Of types introduced after the establishment of close contact with the Roman world the 'pie-dish' (6-8) is the best represented, while other types of Roman origin, such as the imitations of Samian forms (13, 14), are comparatively rare. The survival of native traditions at a rural site such as Hedgerley need cause little surprise, since even at a large town such as Verulamium the Romanized descendants of Belgic forms are to be found throughout the second century. Both the technique of the Hedgerley potters and the quality of their ware are, however, thoroughly Roman.

Two main varieties of ware appear on superficial examination; one is hard and grey, the other is softer and buff-coloured. This distinction is not always clear, however, and it would in any case appear to result rather from different degrees of firing than from intentional differences of manufacture. Confirmation of this is provided by the fact that wasters, showing distortion and irregular surfaces due to overfiring, occur only in the hard grey ware. Vessels of the softer ware have normally had a smooth grey surface, although in many cases only slight traces of this have been preserved. A few of the jars, of types 1 and 11, have a white or cream-coloured slip. The ware,



POTTERY FROM HEDGERLEY KILN SITE.

(Scale represents 6 inches.)

whether hard or soft, is normally of good, even texture, but appreciably sandy. All the pottery is wheel-turned.

The examples figured have been selected from a much larger mass of sherds. They illustrate the leading types, as well as some unusual ones, and they also provide points of chronological significance.

Jars

(i) *Wide-mouthed jars*[1] (1, 2). Jars of this type are among the most common and distinctive products of the kilns. The type is a well-known Romanized derivative of a Belgic form, and survives at least until the end of the second century A.D. In the first century it has a good angular profile and well-marked cordons or grooves on the shoulder, and the diameter of the rim is considerably less than that of the body (*Archaeologia*, lxvi, p. 249, 21, 22). In the second century the diameter of the rim is increased, the profile becomes more curved, and the cordons and grooves diminish (*Verulamium Report*, fig. 35, 66; c. A.D. 110-140). To this later phase belong the Hedgerley examples. Two of the largest are figured; they show undercutting of the rim, a feature absent in smaller examples from the site.

1. Dark buff ware with grey surface. Between a feeble cordon at the base of the neck and a narrow groove is a zone decorated with vertical smoothed lines. This is one of three such pots from Kiln 1 filling. Of the other two (not figured) one is similar, but the rim is not undercut; the other has no cordon at the base of the neck, and instead of vertical lines there is trellis pattern.

2. Similar, but undecorated. Brownish-buff ware with grey surface. Entrance of Kiln 1. *Verulamium Theatre Report*, fig. 10, 6 (dated end of second century; the Hedgerley example has a relatively narrower mouth and is earlier). Pl. VIII.

(ii). *Large narrow-mouthed jars* (3, 11, 12). This type is closely related to the last and has a similar

[1] Pots of this type are sometimes referred to as 'bowls.' In the present report that term has been reserved for wide vessels such as 17.

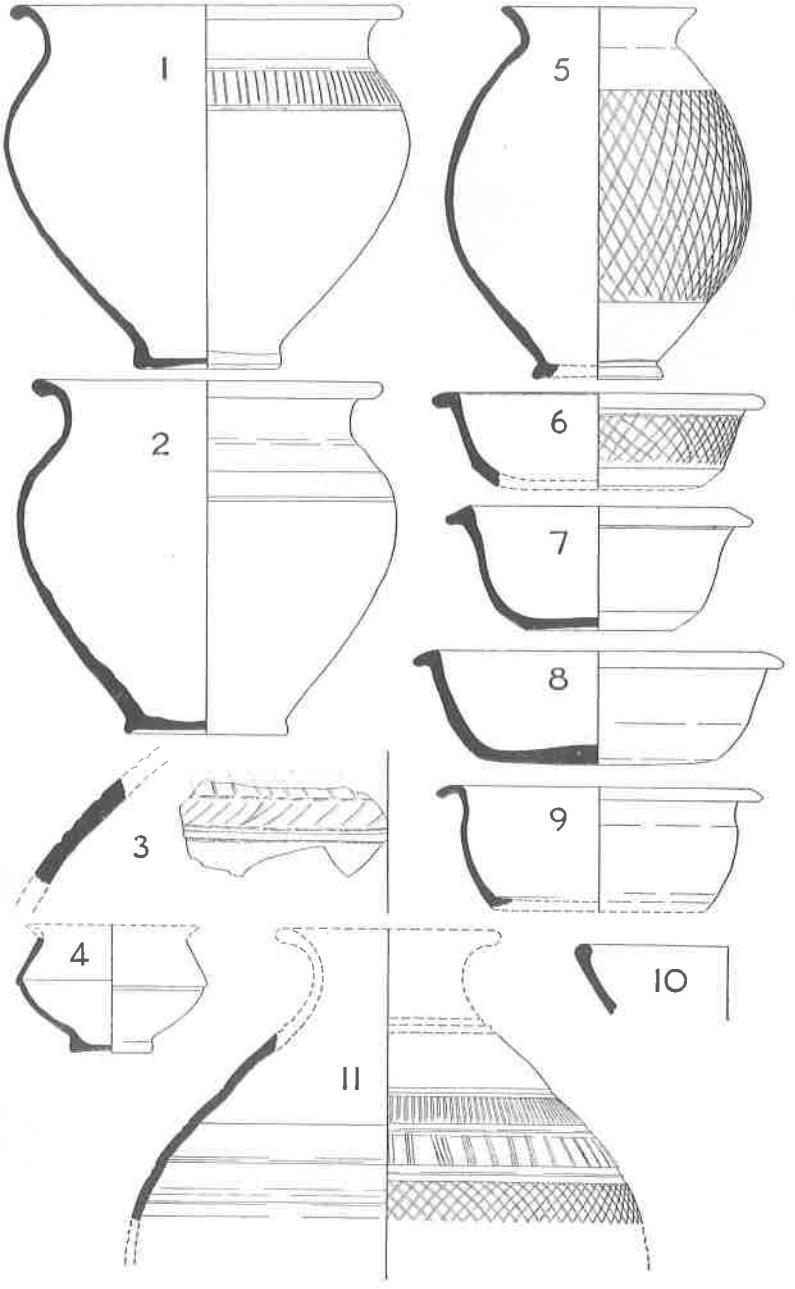
history, which may be well studied at Verulamium. Its Belgic prototype occurs at Prae Wood (*Verulamium Report*, fig. 34, 60), and is succeeded by Romanized forms (*ibid.*, 61, 62, dated Flavian and early second century respectively).

3. Sherd from the shoulder of a jar in hard grey ware, Stoking-pit 1. It is figured to show the decoration (oblique slashes between grooves), which is not otherwise represented on the site. For similar herring-bone decoration with grooves, cf. *Procs. Prehist. Soc. of E. Anglia*, vii, (part 2), p. 248, 32 (Runcton Holme, Norfolk).

11. The narrow neck, with strongly everted rim of this jar, may be restored from other examples. These are all of a pear-shaped form with at least three cordons or grooves on the shoulder, usually enclosing zones decorated with smooth vertical lines and trellis pattern. This example is one of the most elaborate and the decoration is carefully executed. The zones are divided by double grooves, giving the effect of cordons; below the uppermost zone, which is plain, are three zones decorated with smooth lines, the lowest zone having trellis pattern. The ware is hard and dark grey, and on the two upper zones is a thin cream-coloured slip, streaks of which run down on to the lower zones. Kiln 1 filling. *Verulamium Report*, fig. 35, 62 (early second century). *Journ. Roman Studies*, xxii, part 1, pl. xi, K2, K3 (from the Caistor kilns, first half of second century). Other examples include one from a high level in stoking-pit 2. The type also occurs in light grey ware with smooth surface, with similar vestigial cordons, but otherwise undecorated, from Kiln 1.

12. Large jar in hard grey ware, over-fired, from Oven B. The walls are noticeably 'rippled' from turning on the wheel. The plain base is restored from a similar vessel, also over-fired, from Kiln 1 filling. This undecorated type, with one vestigial cordon high up on the shoulder, besides the usual one at the base of the neck, is a simpler and coarser variety of the preceding one, and it may be compared with Antonine pots found

PLATE IX.



2ND CENTURY POTTERY FROM HEDGERLEY (¼).

in the Roman Cemetery at Ospringe, Kent (e.g., *Ospringe Report*, 394, 437). Pl. VIII.

(iii). *Plain large jars*, similar to the above, but with wider mouths, also occur, but do not call for special comment. The example figured (16), from a high level in Stoking-pit 1, is a brownish-buff ware, with a grey surface; it has a slight ledge at the base of the neck and a groove on the shoulder. It would have an ovoid body and a plain base like 12.

(iv). *Jars (Collingwood Type 72) decorated with trellis pattern*, are represented by a number of sherds, but the type is not very common on the site. The only complete section found (5), from Kiln 1 filling, is of buff ware with black surface. It has a cavetto rim rising from a slight ledge—features which show it to be not earlier than the second quarter of the second century. The body is ovoid and decorated with trellis pattern of smoothed lines. A departure from the normal Roman type is made in the moulded base, a feature obviously taken over from the wide-mouthed jars (1, 2). *Verulamium Report*, fig. 27, 14 (dated c. A.D. 160-190); the Hedgerley example is better formed and probably somewhat earlier.

Dishes

(i). '*Pie-dishes*' (6-8). The examples of this well-known second-century type form a large and distinctive group. They occur in a soft red ware, as well as in the usual buff or grey. Trellis pattern of smoothed lines is the only form of decoration, and many of them are undecorated.

6. Dish of light grey ware, decorated with trellis pattern. It has a well-defined chamfer at the junction of wall and base. Stoking-pit 1. Collingwood Type 45, Hadrianic and Antonine.

7 and 8. Dishes of dark buff ware, 7 having a black surface. Both from Kiln 1 fire-hole. They are undecorated versions of 6. 8 exemplifies a tendency, seen also in other examples, for the chamfer to widen and to merge into the wall, but this appears to be of little chronological significance. Pl. VIII.

(ii). *Other dishes* (9, 10).

9. Dish with double-curved wall and thin everted rim; buff ware with grey surface. Stoking-pit 2.

10. Rim of small dish with internal swelling; buff ware with grey surface. Stoking-pit 2. There are early Antonine parallels at Caerleon.

Bowls

17. Bowl, with rounded carination and two offsets inside the rim, and decorated with two lines of scored wave-pattern; buff ware. Stoking-pit 1. *The Roman Legionary Fortress at Caerleon*, Type 386 (dated Trajan-Hadrian). For remarks on wave-pattern see Dr. R. E. M. Wheeler's *The Roman Fort near Brecon*, p. 231, where its occurrence in the late first and early second century is noted—"the single wavy line may have outlasted the combed wave, but even that seems to be rare or absent on Antonine sites." At Hedgerley, however, double or single lines of it are occasionally found in conjunction with zones of trellis pattern on sherds representing jars of the type of 1 or 11, for which an early Antonine date is probable. See also 21.

There are a few other sherds of thick everted rims apparently belonging to carinated bowls similar to 17.

21. Spouted bowl with heavily flanged rim; grey ware. Stoking-pit 1. This was the only example found, and no parallel can be given from any other site. The spout has raised sides decorated with two lines of scored wave-pattern, and the vessel would appear to be an imitation in the local ware of a second-century mortarium form.

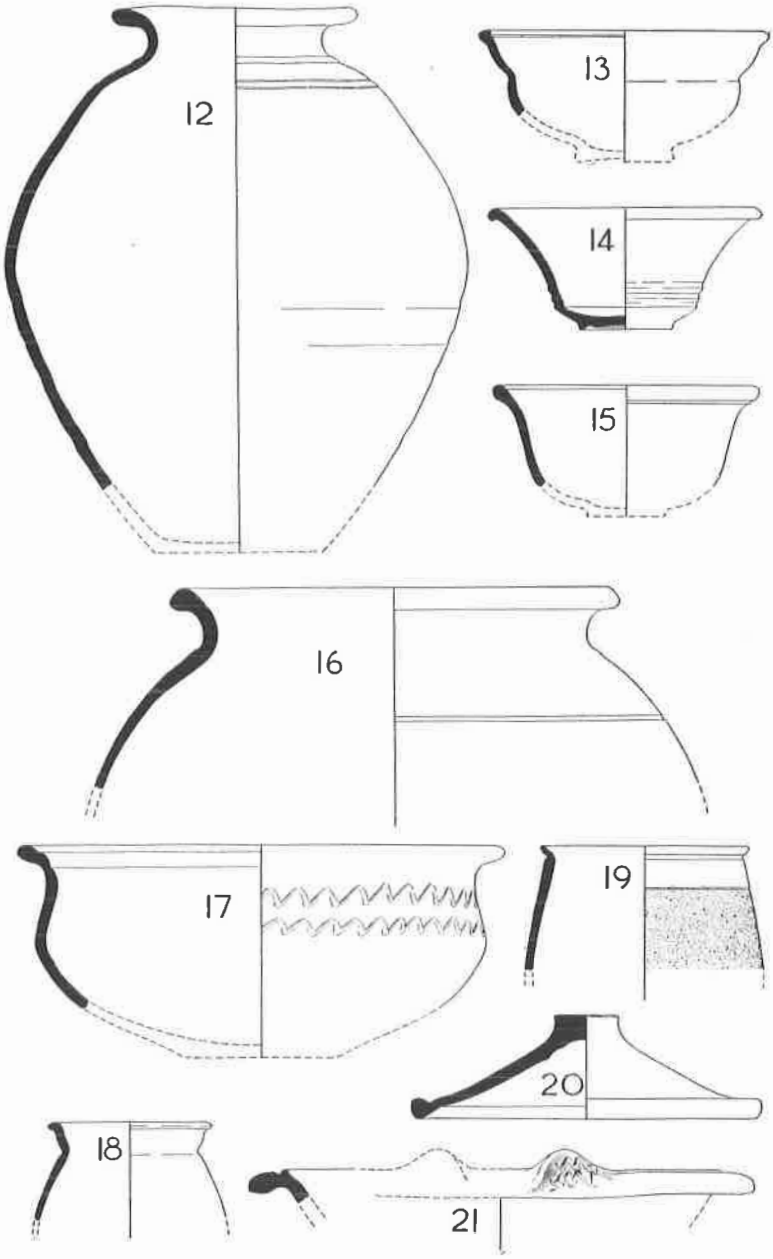
Cups

There are a few forms of these, and all except 13 are represented by single examples only.

(i) *Imitations of Samian forms* (13, 14).

13. Cup imitating Samian Form 27, in smooth buff ware, probably with a grey surface. High level in Stoking-pit 2, from which there are two other examples; one is in buff ware, the other is in smooth grey ware

PLATE X.



2ND CENTURY POTTERY FROM HEDGERLEY (¼).

similar to that of 14. Such imitations are not uncommon on other sites, and they long outlive their prototype. They are dated A.D. 80-120 at Caerhun, and Hadrianic and Antonine at Caerleon.

14. Carinated cup, with three grooves above the carination; light grey ware, with good burnished surface. 1934 trial pit. This is an imitation of the second-century Samian Form 46. Pl. VIII.

(ii). *Other forms* (15, 4).

15. Cup with rounded carination; buff ware with smooth dark grey surface. Kiln 1.

4. Carinated cup, or small bowl, with moulded base; gritty buff ware with smooth dark grey surface. 1934 trial pit. Similar forms occur in the first half of the second century at the Caistor kilns (*Journ. Roman Studies* xxii, part 1, pl. x), and there is a Belgic prototype (e.g., *Verulamium Report*, fig. 15, 38).

Beakers

18. Beaker, or small jar, with rim of pointed section and a slight ledge at the base of the neck; red ware with traces of a dark slip. Three sherds of this pot were found—one in the charcoal on the floor of Oven B, the other two at a high level in Stoking-pit 2. No other examples of its type occurred, and it would not appear to be a product of either of the kilns. The type is a common one in the second century, and the present example is perhaps early Antonine.

Rough-cast Beakers

19. Beaker with small everted rim; grey ware. Below a narrow groove the surface is covered with fine grey rough-cast. Stoking-pit 1. There are a few other sherds of angular everted rims belonging to similar beakers, and one of these sherds also shows rough-cast. The type (Collingwood 77) extends from the Flavian period to the Antonine. The flat curve of the wall in the Hedgerley examples is some indication that they belong to the latter period.

Lids

There are only two or three examples of these. The one figured (20), from Stoking-pit 2, is in light brown ware, and belongs to a well-known Roman type, which does not admit of close dating.

The Period of the Pottery

Kiln 1 may be dated from the pottery actually found in it. Kiln 2, for which no such direct evidence was obtained, can hardly be earlier than Kiln 1, as a pot from the latter is similar to one (12) found in Oven B, which was partly removed to make room for Kiln 2. The two pots may indeed have belonged to the same batch, in which case it would follow that Kiln 2 was constructed after the abandonment of Kiln 1. All the pottery from the two stoking pits and from the filling of Kiln 1 may be treated, however, as a single group of forms belonging to one definable period.

As may be seen from the dated parallels that have been given from other sites, the pottery found in and near these kilns must have been produced not long before or after the middle of the second century. Confirmation of this is provided by the associated Samian ware, which includes a Form 18/31, dated by Dr. Davies Pryce to the period c. A.D. 130-150 (see above, p. 269). Also foreign to the site is one sherd of a mid-second century ring-necked jug (similar to *Verulamium Theatre Report*, fig. 10, 3 and 4), from Stoking-pit 1.

Although the kilns may well have been established late in the reign of Hadrian (c. A.D. 130), their period of greatest activity is early or middle Antonine, and there is no evidence that they survived the third quarter of the second century.