Report on the Excavations on the Roman Pottery Kiln at Hallcourt Wood, Shedfield, Hampshire (1960)

by BARRY CUNLIFFE

INTRODUCTION

THE kiln[1] is situated in the north-east corner of Hallcourt Wood (Nat. Grid ref. SU 54921268), midway between Wickham and Botley and about ½-mile south-west of Shedfield. It lies 10 miles north-west of Portsmouth. The archaeological significance of the site was first recognised by A. G. Rogers, Esq., who reported the existence of a low mound and scatter of Roman pottery to the Portsmouth museum. In 1952, as a result of this report, Mr A. Corney dug a trial trench into the mound which revealed three gullies cut into the natural sand and a quantity of ash and potsherds, some of which were wasters.[2] All the indications suggested the existence of a pottery kiln in the area. Consequently an excavation was arranged from 10-18 July 1960.

THE SITE

The kiln is sited at 75 ft. above sea level, on wooded ground which slopes down to a stream 100 yards to the south. The geology of the area is of clayey Bagshott and Bracklesham sands, suitable for pottery making when mixed with the London Clay which outcrops about 1 mile to the north. Two Roman roads run within ½-mile of the site: the road from Winchester towards Portchester to the east and the road from Bitterne to Chichester to the south.[3] Thus the kiln is well supplied with the raw materials needed for pottery making—clay, running water and wood. In addition to this it is ideally situated near the junction of the two main roads of the area.

The kiln was built on a platform terraced into the natural slope of the land, the area to the south and east having been used as a dumping ground for the ash and wasters. A few feet to the south, on the downhill side of the kiln, a shallow gully (gully 1) 12 in. deep was dug into the natural. The purpose of this structure is not clear, it could (and in fact did during the excavation) drain the area of the south-west flue, but the water is not allowed to drain off downhill. In addition to this the clayey nature of the subsoil tends to retain the water. For this reason, it is suggested that it performed a dual function: to drain the working area in wet weather and to provide a reservoir of water for the process of pottery making. In the north-west end of the gully were found the fragments of two practically complete pots.

1. This should not be confused with the 'Roman Kiln' marked on the 6 in. O.S. Sheet 66 S.E. which lies 500 yards to the south-west of the kiln to be described. See below.

2. H.F.C. *Proc.*, Vol. 18 (1951-53), p. 377.

3. The line of this road from Botley to Wickham is largely unknown. Mr R. Maitland Muller claims to have traced it from SU 54041195 to 54051185 (information from Ordnance Survey). Mr J. Ford of Biddenfield Farm told me that a hollow way running exactly along this line has always been known to his family as 'the Roman Road'.

The 1952 trench sectioned two other gullies: gully 2, 9 in. deep and 12 in. wide, and gully 3, 12 in. deep and 2 ft. wide, neither of which appeared in the subsequent excavations.

THE KILN (Figs. 1 & 2)

The kiln is of the up-draught type (Grimes, Type A1[4]; Corder, Type IB[5]) consisting of a stokehole pit, flue and furnace with a temporary floor of fire-bricks. In plan it bears a superficial resemblance to the horizontal draught kiln,[6] but this similarity was caused by modification during the life of the kiln. Two major phases in the history of the kiln were recognised.

First Phase

In the first phase, the kiln consisted of a furnace, and the north-east flue and stokehole pit.

The Furnace

The furnace was approximately circular, 4 ft. 3 in. in diameter at the floor level. The walls, built of flints set in yellow sandy clay, survived to a height of 1 ft. 6 in. above the floor, in thickness they varied from 1 ft. to 2 ft. The furnace was floored with a layer of clay 2 in. thick, with small flints set into it: the walls were faced with similar material. No indication of the original height of the walls has survived but it seems unlikely that they stood to more than 1 ft. 9 in. above the level of the floor.

The Flue

The north-eastern flue, contemporary with the first phase in the kiln's history, was 3 ft. 6 in. long[7] and 2 ft. 4 in. wide at floor level, with side walls built of flints and roughly shaped sandstone blocks set uncoursed in yellow clay. No trace of the way in which it was bridged remained. Probably the roof consisted of clay supported on a wooden framework. On the first firing the wood would burn away and leave the clay baked in position. This suggestion was to some extent supported by the discovery, in the filling of the flue, of large featureless lumps of baked clay which may have represented the collapsed roof. The clay and flint floor of the furnace was not continued into the flue, the floor here being of the natural sandy clay lowered to 6 in. below the furnace floor.

The Stokehole

The stokehole was a simple hollow in the natural at the entrance of the flue. A layer of charcoal and ash filled it to a depth of 9 in. and extended into the flue. Some time after its construction the north-eastern flue was abandoned. The most likely explanation for this is that rain-water and surface run-off from higher up the slope accumulated in the stokehole and put the fire out. (This is well in accordance with the experience of the excavators.) That the period of time between the construction and abandonment of this flue was short is suggested by the facts that the floor of the stoke hole and flue show little sign of intense heating, and that the clay floor and walls of the furnace, though reddened by heat, are not baked hard as are the subsequent floors contemporary with the south-west flue.

4. Grimes, Holt: The works depot of the 20th Legion at Castle Lyons (*Y Cymmrodor*, Vol. XLI, 1930, p. 53).
5. Corder, The structure of Romano-British Pottery kilns (*Arch. Journal*, CXIV, 1957, pp. 13, 17).
6. Grimes, *ibid.*, Type B; Corder, *ibid.*, Type II.
7. The south wall was shorter due to subsequent collapse.

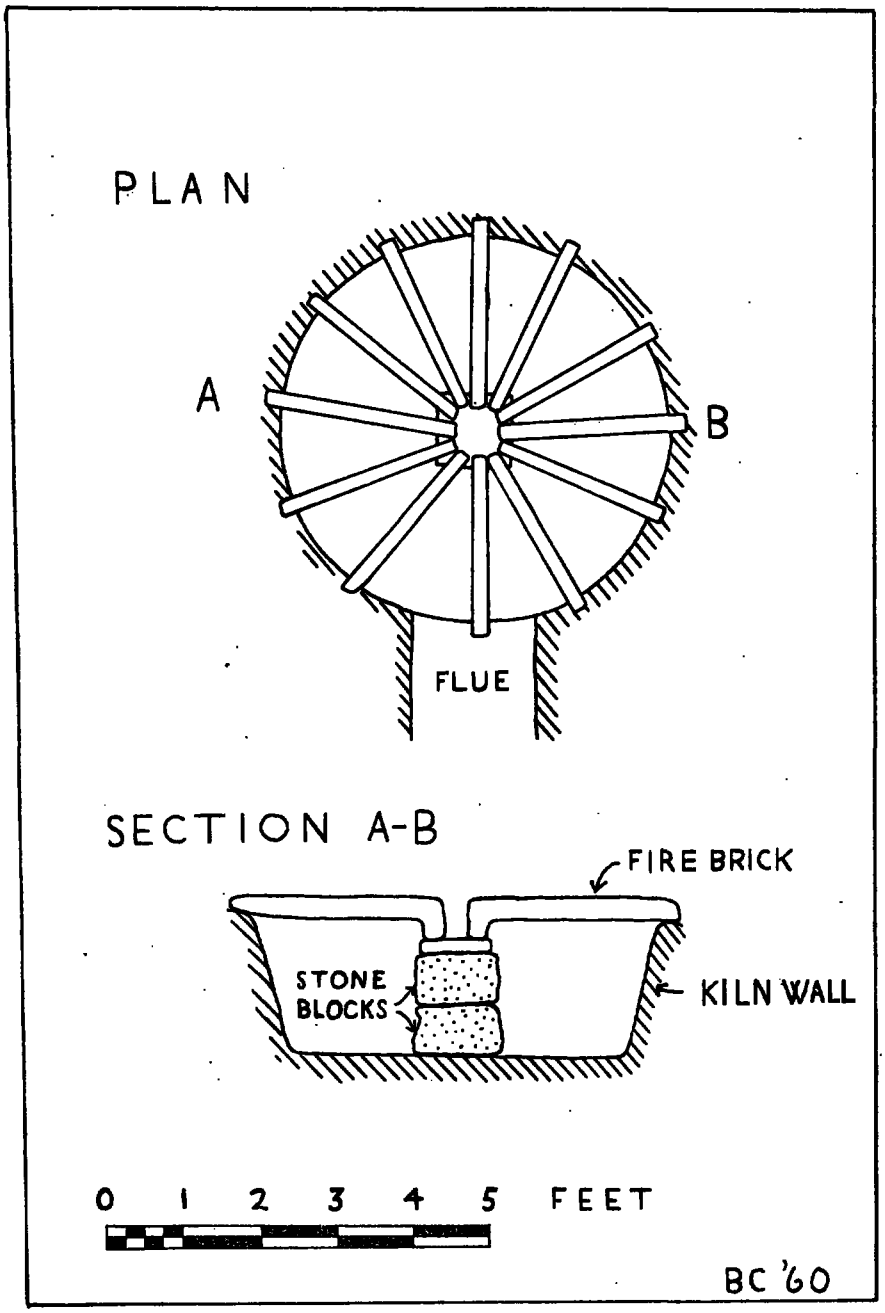


FIG. 1. Hallcourt Wood Kiln. Diagrammatic reconstruction of the kiln furniture

GARMONT I 1.36.C

EXCAVATIONS ON ROMAN POTTERY KILN AT HALLCOURT WOOD

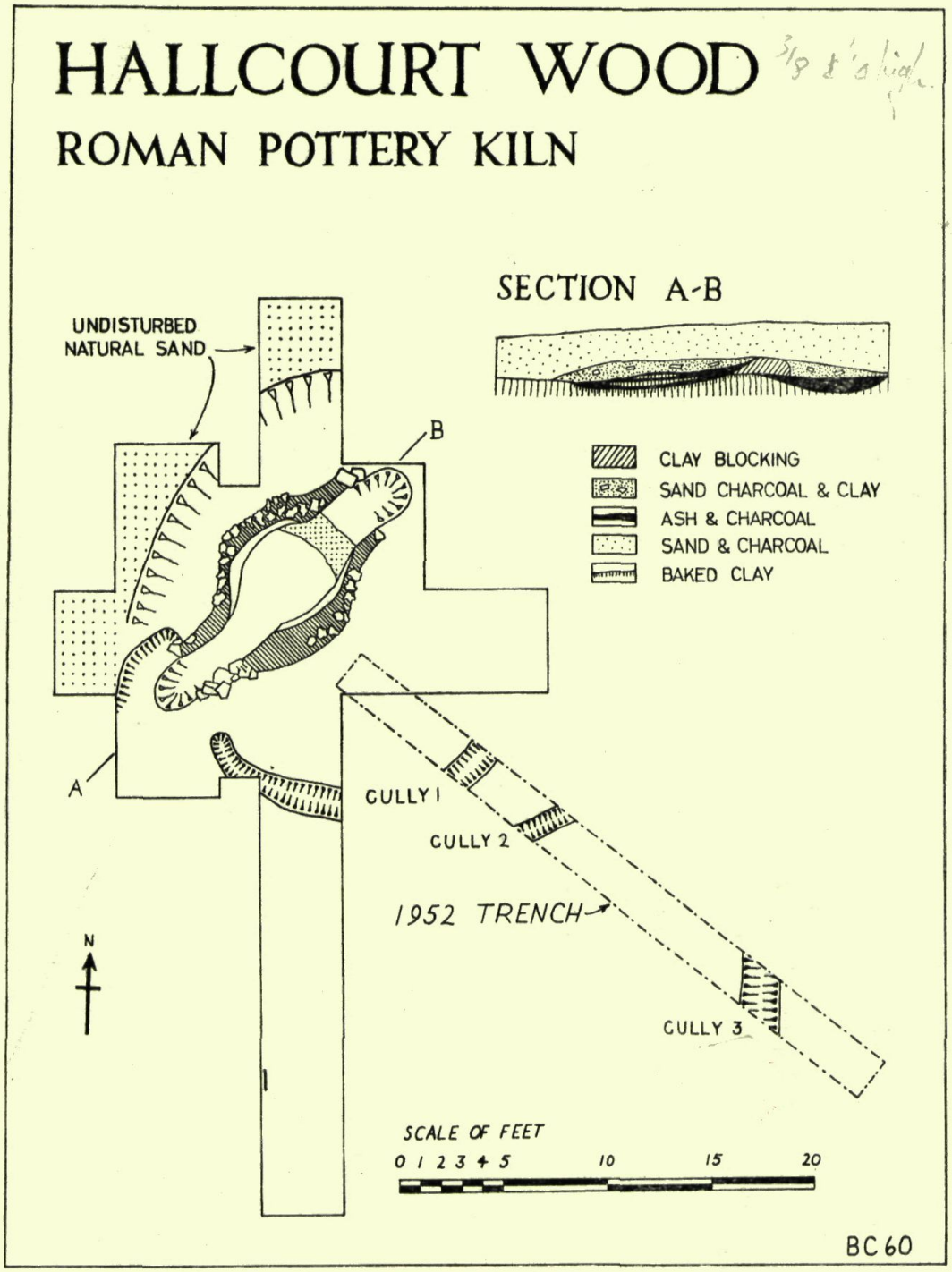


FIG. 2.

SECOND PHASE

The reconstruction of the kiln consisted simply of blocking off the north-eastern flue with a wad of clay and building a flue at the south-west to replace it.

The Furnace

The main body of the furnace remained unchanged. A new floor level was cut through, and to about 6 in. below, the surface of the original floor of phase one. The surface of the new floor was that of the natural clayey sand into which it was cut, baked hard and red by intense heat. Subsequently two other floors, 2 in. thick, were superimposed, separated in each case from the one below by a thin layer of charcoal. Both floors were made of clay incorporating large fragments of storage jar. Contemporary with the constructions of these floors, the walls of the furnace were relined. Above the last floor the furnace and flue were blocked with charcoal, broken fire bricks, potsherds and shapeless lumps of clay.

The Flue

The south-west flue was 3 ft. 6 in. long and 1 ft. 9 in. wide at the floor. Its walls, constructed of rough sandstone blocks, broken fire-bricks and large potsherds, all set in yellow clay, were built on a ½-inch thick layer of charcoal and ash which rested on natural and must have accumulated when the kiln was fired from its north-eastern flue. The fire-bricks and potsherds built into the flue indicate the secondary nature of this structure. The later floors of the furnace were extended into the flue.

The Stokehole

The south-west stokehole was similar to the north-east, a simple hollow cut into the natural sand.

THE KILN FURNITURE

What little that remained of the kiln furniture was recovered from the debris filling the kiln. Two types were recognised:

A. *Fire-Bricks*

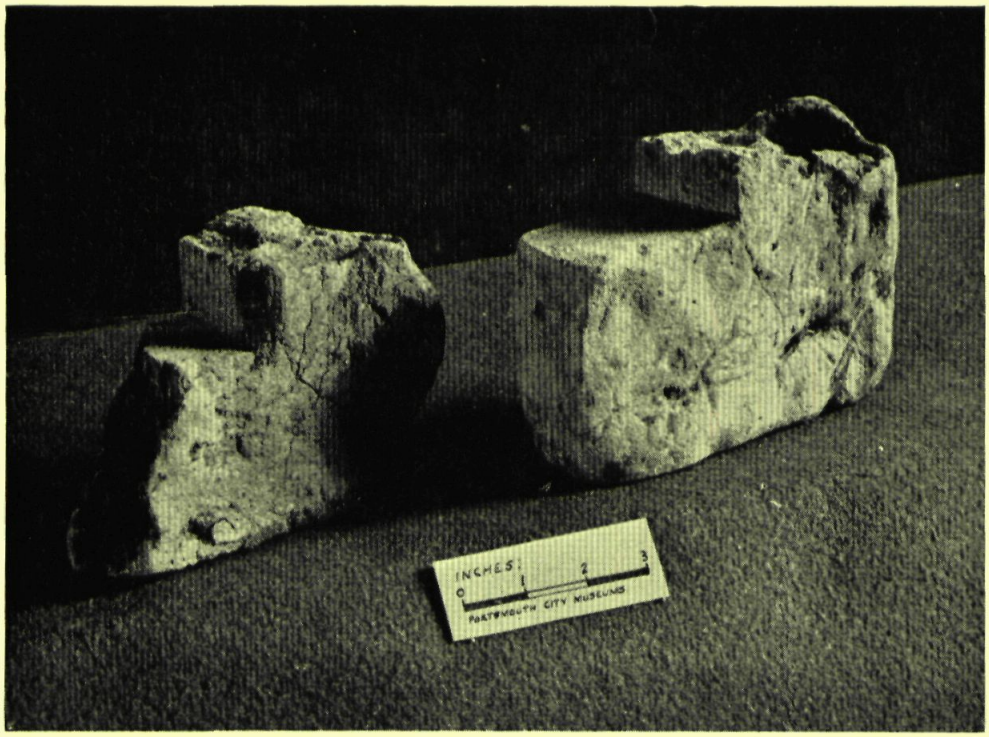
Fragments of several fire-bricks, of a hitherto unrecorded type, were found. In no case was it possible to reconstruct a complete brick, but fortunately the ends of two bricks survived indicating the general form which they must have taken. The bricks were L-shaped, the short arm measuring internally from 3·0-3·8 in., the long arm (if the reconstruction is correct) measuring about 26 in. In both specimens the long arm was broken off, the maximum surviving length being 5 in. In cross-section the bricks measured, on average, $2 \times 3\frac{1}{2}$ in.

In the suggested reconstruction the short arm would rest on the central support and the far end of the long arm would rest on the kiln wall. A group of bars arranged radially in this way would provide a surface on which the pots could be placed.

B. *The Central Support*

If the above arrangement were adopted and if the furnace wall is assumed to be 1 ft. 9 in. in height above the floor, the height of the central support, on which the short arms of the fire bars would have rested, must be 18 in. From the debris filling the kiln were recovered three fragments of a brick, 2 in. thick and 10 in. square. In addition to this was found a roughly shaped sandstone block, approximately 12 in. square and 7 in. thick. If we assume the existence of another block of similar dimensions (since removed) the central support would consist of a pillar built of two stone blocks capped by a brick to provide a regular surface on which to rest the fire-bricks.

PLATE IA



[Photo by A. Corney

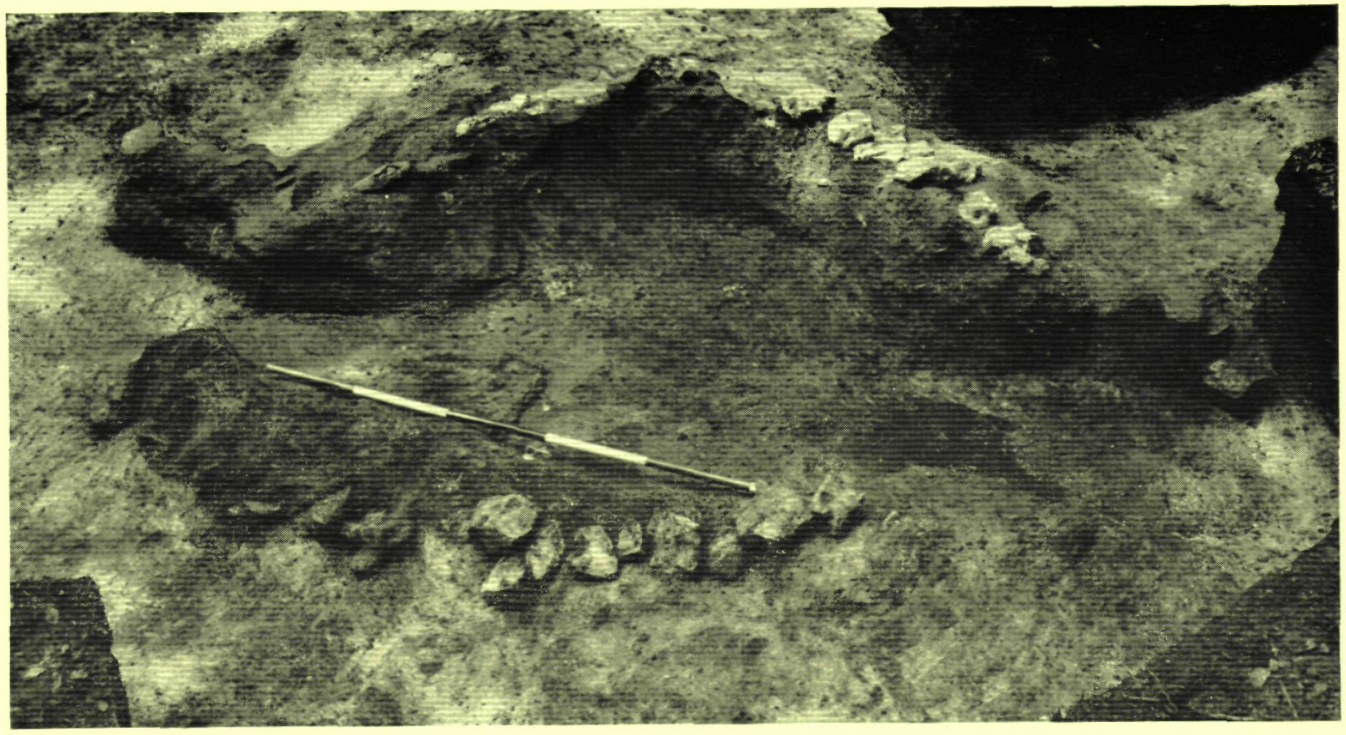
Hallcourt Wood Kiln, Fire-bricks

PLATE IB

[Photo by A. Corney

Hallcourt Wood Kiln. Broken pots in position in the end of gully 1

PLATE II



[Photo by A. Corney

Hallcourt Wood Kiln. View of Kiln when excavated

POTTERY

I. Analysis

Types and Percentages

From the large amount of pottery recovered, the following types occurred in sufficient quantities to indicate that they were the produce of the kiln:

Type A. Rope-rimmed storage jars.
B. Bead-rimmed carinated jars (*a*) large,
(*b*) small.
C. Cavetto rim jars (*a*) large (i) wide bodied,
(ii) narrow bodied.
(*b*) small (i) wide bodied,
(ii) narrow bodied.
D. Necked carinated jars.
E. Shouldered jars.
F. Dishes.

A brief explanation should be given of the statistical methods employed to arrive at the figures printed below. An important primary observation was that the density of pottery varied little over the area excavated.[8] Thus the pottery group may be regarded as a random sample. The total rim length of each type was measured; this divided by the average circumference of the pot type gives the minimum number of pots present. The figures for each group may directly be compared to give a series of percentages. This method is, of course, more accurate than a simple comparison of the numbers of rims present.

Type	Total rim length (cm.)	Average radius (cm.)	Average circumference (cm.)	Minimum No. of pots	%
A	272	20	126	2·16	8·0
B (*a*)	557	13	82	6·79	25·3
(*b*)	55	8	50	1·10	4·1
C (*a*) i.	157	12	75	2·09	7·8
ii.	323	12	75	4·31	16·0
(*b*) i.	77	8	50	1·54	5·7
ii.	197	8	50	3·94	14·7
D	195	13	82	2·37	8·8
E	190	13	82	2·32	8·6
F	20	13	82	0·24	0·9

Further Analysis

From the figures quoted above it might be hoped that further information could be obtained, e.g. the number of firings, output and life of the kiln. The calculation would proceed as follows:

Total area of pottery spread indicated by the excavations - - 1570 sq. ft.
Total area sampled, excluding the area of the kiln and undisturbed natural - - - - - - - - - - - 200 sq. ft.
(The depth and density is practically a constant throughout and can be disregarded in this example.)
Minimum number of pots in the area sampled - - - - - 27
Therefore minimum number of pots in the total area - - - $\frac{1570 \times 27}{200} = 212$

8. This statement is true with the exception of the area within the kiln. Here only rope-rimmed storage jars were found forming the basis for the floors. The rim length of 420 cm., compared with 272 cm. outside the kiln, was left out of the calculation because of the selective nature of this group.

Assuming that no wasters were removed from the site and that none were imported, the figure 212 must represent the *maximum* number of wasters produced in the kiln's history.

Assuming (for the sake of the example) that three good pots were produced for each waster:

The total number of pots fired = 848

If the capacity of the kiln at each firing was 40 pots then the total number of firings would equal 21.

The above figure for the number of firings is based on many approximations, the weakest being the number of wasters to one good pot and the capacity of the kiln. If the former is given a 2 : 1 probability of the figure falling between the ratios 1 : 2 and 1 : 4 and the latter the same probability between the limits 25 and 55, then there is about a 2 : 1 chance that the actual number of firings falls between 12 and 43, a figure which in itself is not very useful but does indicate an order of magnitude.

If a kiln could be found with the contents of its last firing *in situ*, then the error in the above calculation could be much reduced.

II. Description of the Pottery Types

A. *Rope-rimmed storage jars* (Fig. 3)

Large storage jars with a thick rim moulded by diagonal finger marks giving the appearance of rope. The body is globular and roughly smoothed externally with the fingers giving a corrugated impression. In some specimens this is absent and the body is smooth. Internally, just below the rim, there is a row of thumb impressions in most examples. The internal body wall (and sometimes base) is indented by rows of finger impressions, the fingers being drawn up towards the rim.

Examples of this form found on other sites often had small holes made through the body and base before firing. In only one example from this kiln has this feature been noted. In this a small hole, $\frac{1}{8}$-in. diameter, was made in the base of the pot.

The paste is generally of a hard sandy nature and includes, in many examples, large flint grit.

B. *Bead-rimmed jars* (Fig. 4)

Jars with a well-defined bead rim and a sharply carinated shoulder.

In 58 rims the angle between the bead and shoulder is not sharply tooled (2); in the remaining 38 it is.

The exact shape of the bead varies considerably from almost circular in section (3) to horizontally elongated (4) or vertically elongated (5). The illustrations (2-6) indicate the range of variation found in the group.

Variation in size also occurs. For the purpose of the analysis two groups were recognised; the large pots with an average diameter of 26 cm. are in the majority, small pots of average diameter 16 cm. account for only 14 rims.

The paste is hard grey ware, including flint grit in some specimens.

C. *Cavetto rim jars* (Fig. 5)

Four divisions may be recognised:

1. Large, average diameter 26 cm. (*a*) wide bodied, (*b*) narrow bodied.
2. Small, average diameter 16 cm. (*a*) wide bodied, (*b*) narrow bodied.

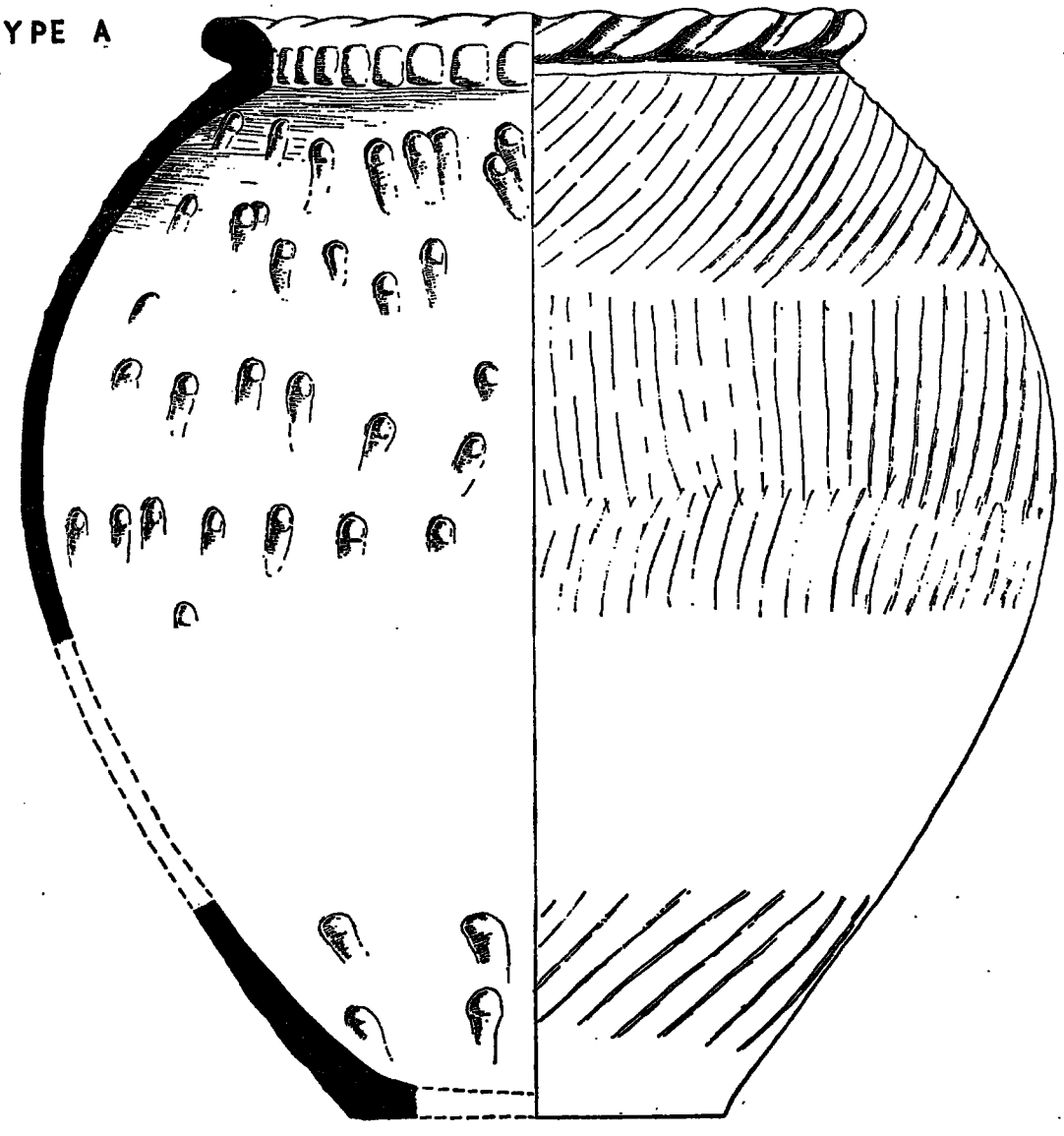


FIG. 3 (¼)

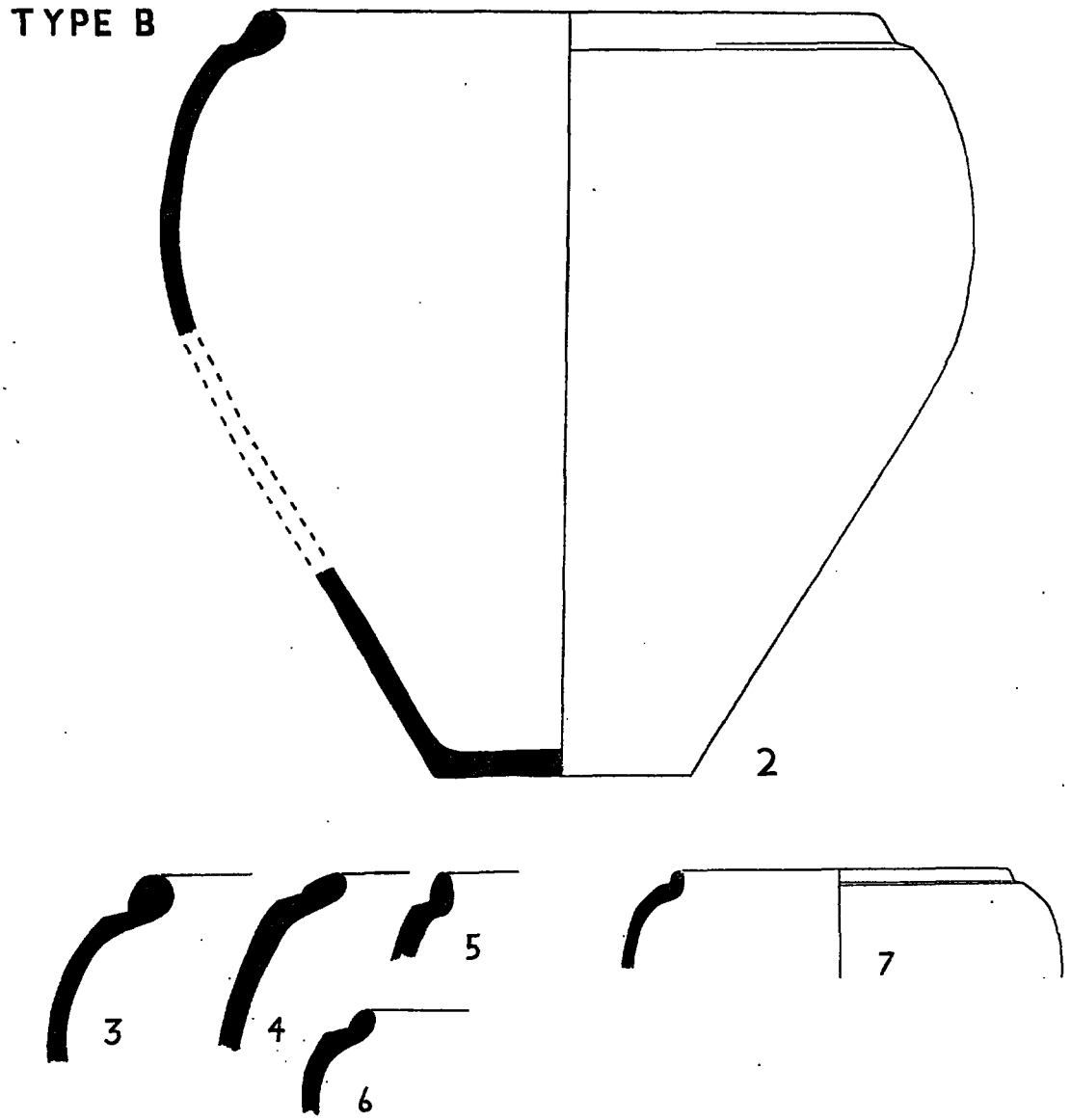


FIG. 4 (½)

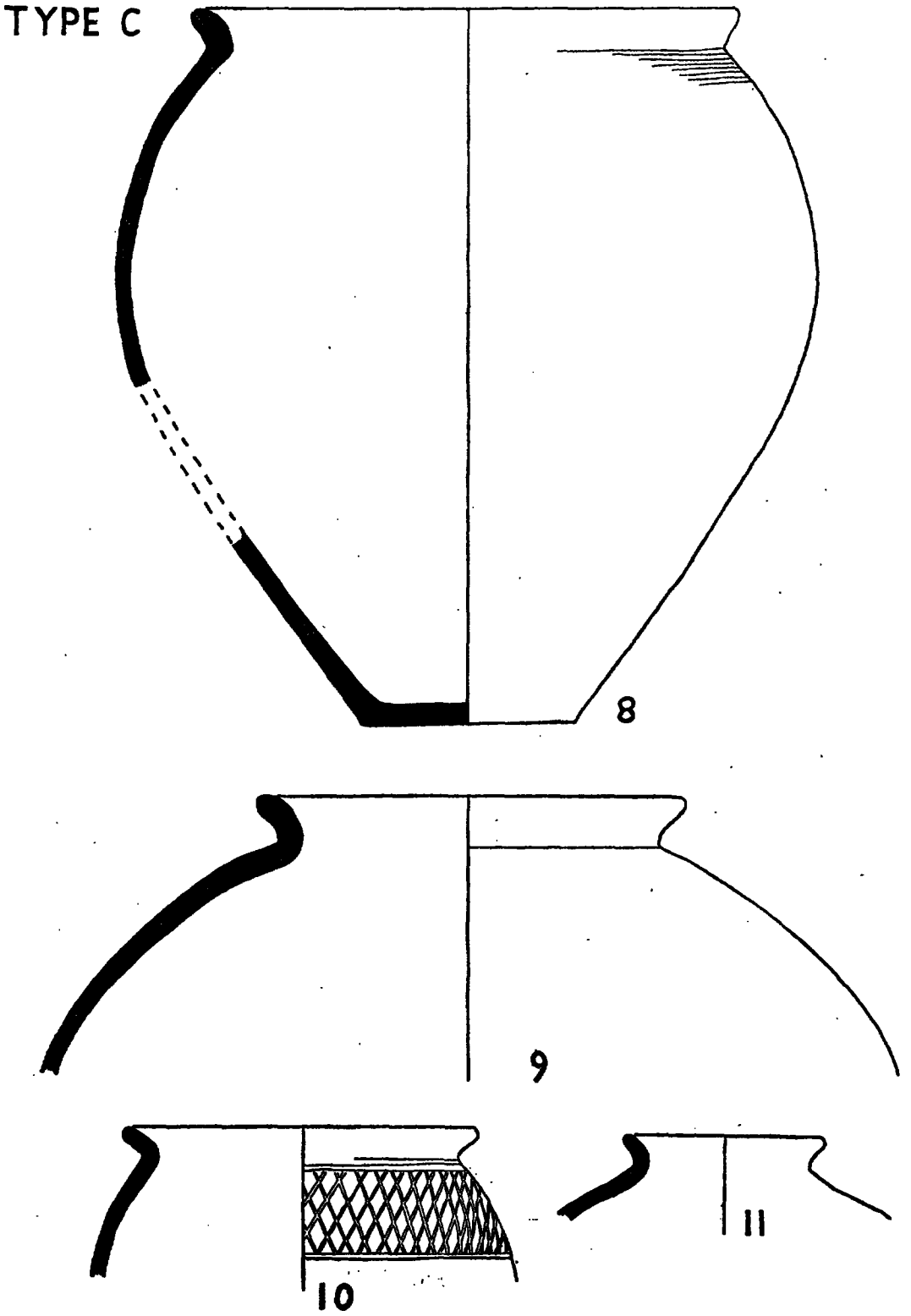


FIG. 5 (½)

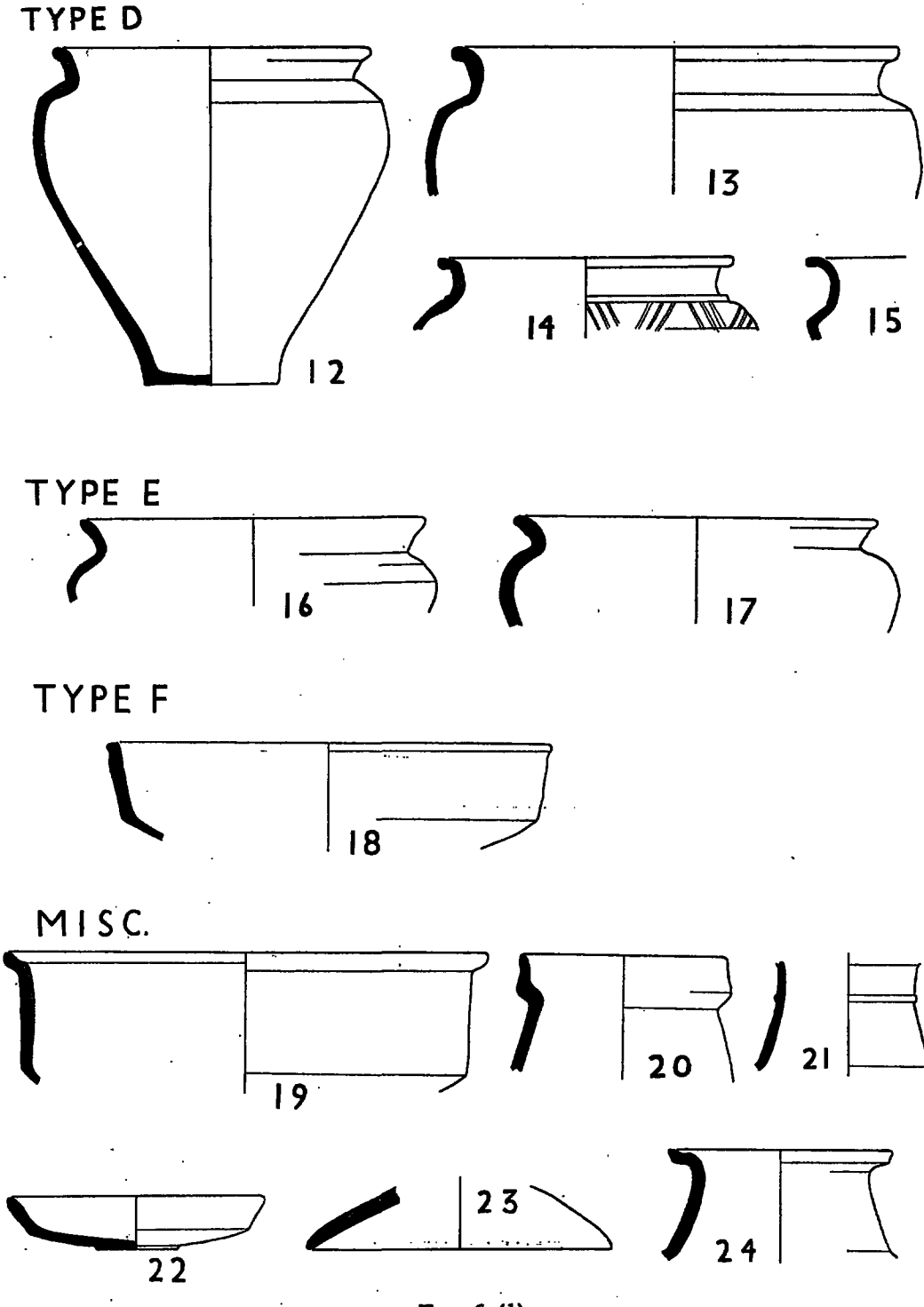


FIG. 6 (½)

The pots are practically characterless, consisting of a simple cavetto rim and evenly curving body.

Decoration is almost absent: a very few sherds have a roughly burnished zone below the rim (8). Only one sherd (10) has an acute-angled lattice zone on the upper part of the body.

The paste is hard grey, the larger pots having small flint grit tempering. Pale grey slipping occurs but is rare.

D. *Necked carinated jar* (Fig. 6)

The jars have a vertical neck with rim slightly everted at the top. The rims are vertically flattened externally in about half of the examples. Internally a slight horizontal flattening occurs in all the specimens. This is particularly marked in two specimens but this may be due to distortion in firing. A cordon between neck and shoulder formed by double tooling occurs in only one example (14). An incipient cordon formed by single tooling occurs in 10 of the 26 specimens (15). The shoulder is sharply angled in all but two examples.

Decoration consisting of groups of oblique shallow-tooled lines on the shoulders occurs in four specimens. Traces of a pale grey slip is found on nearly all the sherds. Paste of hard grey sandy ware was aimed at—some, however, are underfired and remain red/cream.

E. *Shouldered bowls*

Bowls with simple cavetto rims and high rounded shoulders without carination. On a few examples the shoulders showed faceting (16), which is best regarded as rough tooling.

The ware is hard grey and sandy but a few ill-fired vessels are of a pinky buff colour.

Most of the specimens still retain a pale grey slip whilst three of the 37 rims show a lightly burnished area on the shoulder.

F. *Dishes*

The dishes have an almost vertical wall, chamfered away below. The top of the rim is flattened. In the example illustrated (18) a tooled line below the rim gives a slightly beaded effect but this is not the general case.

Of the six rims recovered, all were in an ill-fired grey sandy paste suggesting that they were produced at this kiln.

Miscellaneous pots

This group consists of sherds which represent only a few examples. They are best regarded as imported from outside the kiln, although in most cases the ware does not exclude the possibility of a local production,

19 (one example). Vertical walled pie dish chamfered away below; with a rim internally recessed for a lid. There are vague traces of a lattice decoration on the external face of the body wall (too indefinite to be shown on the drawing). Hard grey sandy paste.

20 (one example). Rim of flagon with cupped mouth. Presumably the example had handles. In hard grey sandy paste.

21 (one example). Either neck of a cordoned butt beaker, cf. Hurstbourne Tarrant[9] dated to just pre-Claudian, or part of the base of a pedestal urn, cf. Camulodunum[10] dated to before A.D. 65. Hard grey ware.

9. Hurstbourne Tarrant. *Arch. Journal*, LXXXVII, 1931, Fig. 32, No. 1.
10. *Camulodunum*, Form 204, Plate LXXIV.

22 Platter (one example). Sandy paste fired grey inside, buff outside. It has a plain outward sloping wall carinated away below to a foot ring base.

This type is a native copy of a Gallo-Belgic platter which could best be dated to the second half of the 1st century. A similar example occurs at Clausentum dated to the Flavian period. Cf. Clausentum, Fig. 20, No. 3.

23 (three examples). Shallow domed lid with a plain rim. Hard grey sandy paste. Cf. Clausentum, Fig. 20, No. 19, dated to the Flavian period.

24 (one example). Flagon neck in hard grey paste.

(Not illustrated.) Samian. Base of a Samian, Drag. 27, dated to late 1st to early 2nd century. Very worn but probably early Lezoux.

III. The Date of the Pottery

A kiln the size of the Hallcourt Wood example would have supplied only a small local area. It is unfortunate, therefore, that in its area there is an almost complete lack of suitable published material. The only exception to this is the Clausentum Report[11] which must remain a standard work. The published material from Chichester[12] produces no close parallels whilst from Winchester nothing is yet published. Smaller sites from the intervening area are equally sparse and in all the examples so far published[13] the pottery is virtually unstratified and without datable associations. In view of the paucity of local sites it is necessary to draw on parallels from further afield.

Type A. The rope-rimmed jars are usually regarded as indicative of the late Roman period. Indeed, variants of this type have been found in the New Forest complex[14] and in the Farnham kilns.[15] However examples from Chalton, Havant, Fishbourne and Chichester (all unpublished) need in no case be regarded as late. One example occurs at Twyford Down[16] dated to the 'second half of the 1st century'. All that can safely be said of this form is that it had a wide geographical, and presumably chronological, distribution.

Type B. Bead-rimmed carinated jars are almost entirely found in 1st century contexts. Dr Cotton,[17] discussing the well-stratified Clausentum group, arranges them in a series based on the 'Romanisation' of the Belgic form. On the basis of this classification the Hallcourt Wood group could best be fitted into the Clausentum Type BBR4 assigned to the Flavian period. There is no reason why this type should not survive to at least the end of the 1st century.

Type C. The cavetto-rimmed jars are of little use for dating. The type survives virtually unchanged throughout the Roman period.

11. *Report on Excavations at Clausentum*, 1951-54. Gathercole & Cotton. H.M.S.O.
12. *Sussex Arch. Coll.*, XCIV, p. 111 ff.; XCV, p. 133 ff.
13. Worthy Down, H.F.C. *Proc.*, X, p. 178 ff.; Twyford Down, H.F.C. *Proc.*, XIII, p. 188 ff.; Buckswood quarry, H.F.C. *Proc.*, XIX, p. 147 ff.
14. Black Heath meadow, *Excavations in New Forest Roman Pottery Sites*. Sumner. Plate XXII, Nos. 4-6.
15. Surrey Arch. Coll. LVII, p. 56-57. The use of this type is discussed.
16. H.F.C. *Proc.*, XIII, Fig. VIII, No. 57. The drawing is poor but the actual sherd is on show in the Winchester City Museum.
17. *Clausentum, ibid.*, p. 70.

Type D. The necked carinated jars have many good parallels. At Twyford Down fragments of these vessels occur[18] dated to the second half of the 1st century. At Silchester types with a cordon at the base of the neck are dated variously from the conquest to *c.* A.D. 120.[19] At Worthy Down a type with a cordon but without the sharply carinated shoulder is dated to ' First half of 1st century A.D.'[20] At Farnham[21] this type is dated to about A.D. 120.

At Clausentum it was found down to A.D. 200. Cotton suggests that it is derived from a Belgic form, the later examples showing a progressive weakening of the carinated shoulder.[22] The sharply carinated shoulder of some of the Hallcourt Wood examples would place them early in the sequence (12, 13). It should, however, be noted that other types produced in the kiln at the same time have rounded shoulders. Thus too much reliance should not be placed on strict typology.

This form is widely distributed with many centres of origin.[23]

Type E. The shouldered jars may be regarded as a contemporary variant of the necked carinated jars described above. In chronological and geographical distribution they closely resemble this type.

Type F. The dishes have no clear local parallels.

Summary. Several of the types produced in the kiln appear to be derived from Belgic prototypes. The similarity in type would indicate a date not far removed from the mid-1st century A.D. The paste on the other hand is entirely Romanised.

In the absence of closely dated parallels from other sites, the dating can only be tentative but on the evidence quoted above, supported by the date of the Samian 27, a late 1st century date would appear to be most probable.

ACKNOWLEDGMENTS

The excavation was carried out by permission of Captain J. Franklyn, the owner of the land, to whom I am much indebted. I would like also to express my thanks to Mrs A. K. Ford and Messrs R. and B. Ford, the tenant farmers, for the many facilities they offered us and the keen interest which they showed in the excavations.

Mr A. Corney, of the Cumberland House Museum, Portsmouth, originally suggested to me the desirability of excavating the site. Not only did he arrange permission to dig, and provide tools through the Museum, but he also helped in the excavation and was responsible for the photography.

The excavation was financed by a generous grant from the Joint Archaeological Committee, who also provided some tools and surveying instruments. Mr and Mrs A. Rule, in addition to digging throughout the excavation, helped in many ways with administration and photography. The bulk of the digging (under adverse weather conditions) was carried out by Miss F. Dunn, Mrs A. Rule, Messrs G. Curtis, J. Goodall, R. Hyde, A. B. Norton and A. Rule.

Dr P. Corder kindly read the typescript and made many useful suggestions,

To all those mentioned above, I wish to extend my sincere thanks.

18. H.F.C. *Proc.*, XIII, Fig. VII, Nos. 37, 38, 39, 42, 43.
19. Report on the Excavations at Silchester. *Arch.*, Vol. 92, 1947, Fig. 12, No. 8, and Fig. 13, No. 21.
20. H.F.C. *Proc.*, X, Plate IV, Fig. 51.
21. Surrey A.C., Vol. LIV, p. 52, No. 3.
22. *Clausentum*, Type BN1A and 2, p. 70, Fig. 24, No. 14, 14a; Fig. 31, No. 3; Fig. 27, No. 1.
23. Silchester Kiln. *The Pottery found at Silchester.* T. May.

ROMAN POTTERY AND TILE WORKINGS IN THE BOTLEY, WICKHAM AND BISHOP'S WALTHAM AREA (Fig. 7)

For a considerable time, surface finds have accumulated indicating the existence of an extensive pottery and tile-making industry in the area surrounding the Hallcourt Wood kiln. This is perhaps a convenient time to summarise the evidence to date. In the future, no doubt, other finds will be made to provide a more complete picture of this industry.[24]

(Nos. refer to the Map, Fig. 7)

1. *Hallcourt Wood pottery kiln I*[25] (SU 54921268). This kiln has already been described above.

2. *Hallcourt Wood pottery kiln II* (SU 54541256). The *Archaeological Review*[26] records that in August 1889, 'In the course of some excavations in Hallcourt Wood . . . The site and remains of a Roman potter's kiln 7 ft. 9 in. in diameter have been uncovered, the base being overgrown with thick underwood. Fragments of pottery of the Roman period were also found in the wood.' Mr F. Cottrill[27] recently threw doubt on the dating of the kiln when fragments of grey glazed late Medieval brick, claimed to be from the kiln, were shown to him.

3. *Curbridge, brick and tile kilns* (centred SU 52501203). Scatters of Roman tiles were recorded in 1924[28] centred on the above area. At the two points indicated, fragments of Roman flanged roof tile, box tile, brick and pottery can still be found.

4. *Fairthorn Roman building* (SU 52061184). Roman tiles, a rough tessellated pavement and foundations of a building are recorded.[29]

5. *Locks Farm, ? tile clamp I* (SU 54971639). Discolouration of the soil and surface finds of Roman tiles, bricks and pottery in a vague rectangular patch, 20 in. × 40 in., suggest the possibility of a tile clamp.

6. *Locks Farm, ? tile clamp II* (SU 5431638). Surface finds of Roman tile in concentrations in two or three irregular bumps and depressions.[30]

7. *Braxells Farm tile clamp* (SU 51301518). Whilst levelling a hedge in 1956, Mr C. R. Cross discovered Roman tiles which he reported to the Winchester City Museum. Mr F. Cottrill visited the site and excavated the tile clamp situated there.

The clamp consisted of a rectangular structure, measuring internally 14 ft. 4 in. × 3 ft., walled on three sides by five or six courses of flanged roof tiles. The fourth (short side) was open. The tiles of the wall were laid in clayey sand which was discoloured by heat.

Associated in the debris of the clamp were flanged roof tiles, box tiles and bricks. A little to the south of the structure were found a few sherds of pottery listed below (not illustrated):

(1) Large bead-rimmed carinated jar (Hallcourt Wood type B (a)) in grey gritty paste.

(2) Small bead-rimmed carinated jar (Hallcourt Wood type B (b)) in grey sandy paste.

24. With the exception of No. 7, most of the information was provided by the Archaeology Division of the Ordnance Survey. For No. 7, Mr F. Cottrill, of Winchester City Museum, supplied details.

25. H.F.C. *Proc.*, XVIII, p. 377.

26. *Arch. Review*, Vol. IV, 1889, p. 64.

27. H.F.C. *Proc.*, XVII, p. 361.

28. *Ibid.*, Vol. IX, p. 399.

29. *V.C.H. Hants.*, Vol. I, p. 310; *Arch. Review*, Vol. II, p. 254; *Arch. Review*, Vol. IV, p. 68; *Hants. N. & Q.*, Vol. VI, p. 46-7.

30. Hants V. & Q., Vol. VI, p. 67.

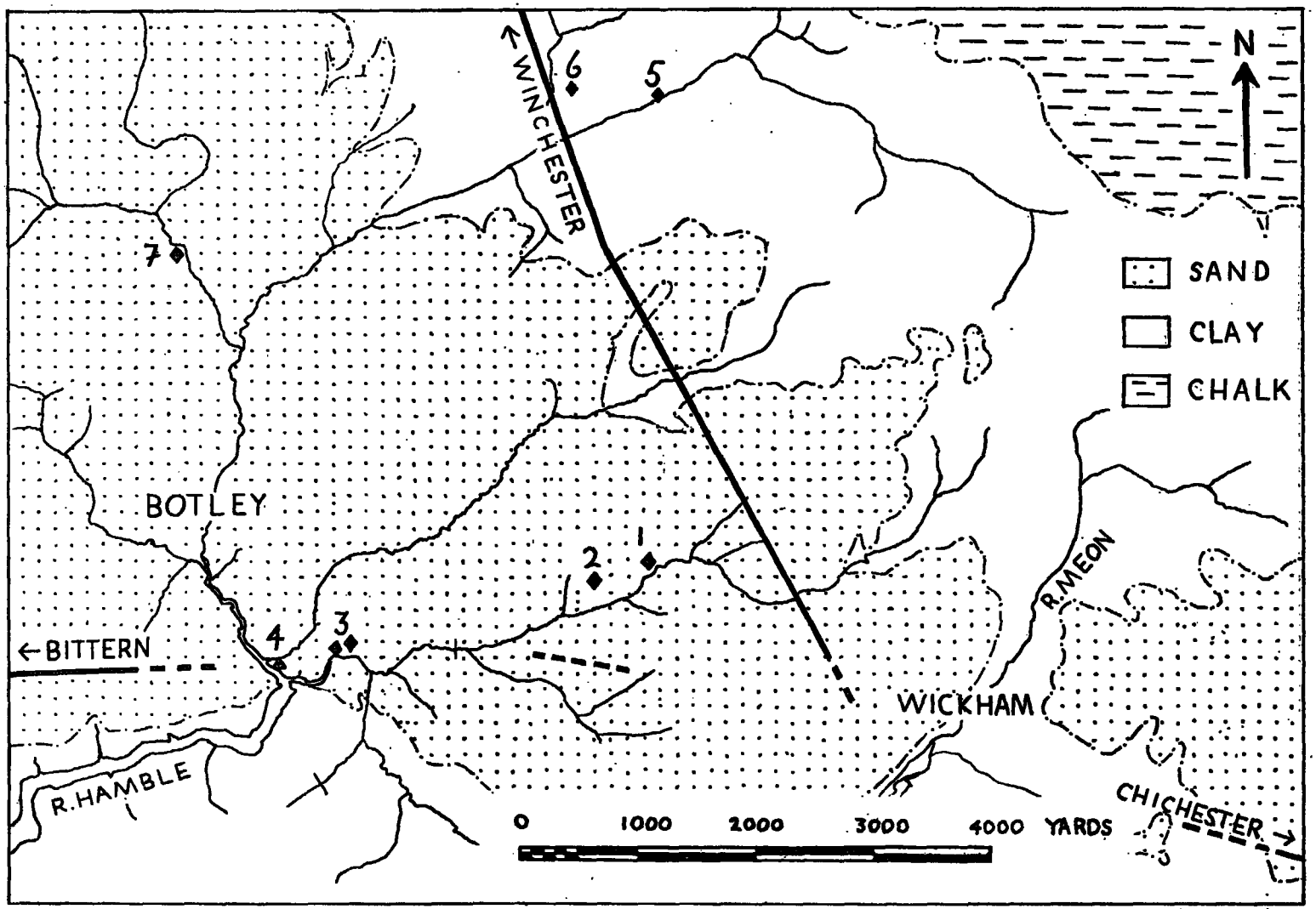


FIG. 7. Map showing the distribution of the Roman sites between the Hamble and the Meon.

(3) Lid/dish. Brown sandy ware with black surface. H.F.C., XVII, Fig. 3, No. 8; Clausentum, Fig. 21, No. 11.

(4) Wall-sided mortarium.

The inclusion of two types from the Hallcourt Wood kiln in conjunction with the other sherds suggest a late 1st century date.

SUMMARY

Of the sites so far discovered, all are sited near rivers and in close proximity to clay and roads. In the Roman period, the area must have been thickly wooded providing ample fuel for firing kilns and clamps.

Little can be said regarding date of the group; the two examples so far excavated (Nos. 1 and 7) appear to belong to the late 1st century. It may not be unreasonable to visualise here an extensive industry giving way, in the later part of the Roman period, to the New Forest group.

ARCHAEOMAGNETIC DATING

by GRAHAM CONNAH

It was hoped that some information regarding the date of this kiln might be obtained by measuring the direction of the magnetic field which would have been fired permanently into the kiln walls at the time of use. The research on this subject which has been carried out in recent years at Cambridge has involved the sampling of many similar structures, with a fair proportion of success. A preliminary report on the earlier part of this work was published in *Antiquity* in 1958.

The site was visited on 30 September 1960 and six orientated samples were removed (code letters " EC "). Subsequently all these samples were measured at Cambridge on an astatic magnetometer, but the overall scatter of results was too great to provide a satisfactory mean value for the magnetic declination and inclination at the time of firing. Only one sample gave a result which might just possibly agree with the excavator's date, but no reliance can be placed on this as dependable results can only be obtained by taking the mean direction of a whole series of samples.

The reasons for this unsatisfactory result are to be sought possibly in the fact that the site was extremely wet when the sampling was carried out. Not only was the work done in fairly heavy rain, which gave trouble to the instruments in use, but the kiln itself was flooded and the burnt clay of which the samples were composed was saturated to such an extent as to have become soft and friable. It is hoped that in the future other sites may be sampled in the Portsmouth area with more success.