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Research Report 10

CURRENT RESEARCH IN ROMANO-BRITISH COARSE POTTERY

Edited by Alec Detsicas

CURRENT RESEARCH IN ROMANO-BRITISH COARSE POTTERY

PAPERS GIVEN AT A C.B.A. CONFERENCE
HELD AT NEW COLLEGE, OXFORD,
MARCH 24 TO 26, 1972

Edited by ALEC DETSICAS, M.A., F.S.A.

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EDITOR'S FOREWORD

IN March, 1972, a weekend conference on 'Romano-British Coarse Pottery: Current Research', organized by the Council for British Archaeology, was held at New College, Oxford. The conference was very well attended and much new material was presented by the speakers as well as emerged in the discussion following each contribution; and, though much of the material presented was in the nature of an interim statement or a synopsis of wider studies, it was generally felt that a permanent record of the proceedings would be of value. The present volume, which the writer accepted to edit, is the response to this feeling.

In the time that has elapsed between the conference and the printing of this report new research and field work have added to our knowledge of Romano-British pottery, and contributors were allowed freedom to recast their original papers in the light of this new material and to incorporate both the results of discussion at the conference and new information. The papers included in this volume are printed in the order given during the conference, in some cases with slightly amended titles. However, it may well be worth stressing again the implication of the title of this report that it is an interim statement of *current* research.

The editor would like to avail himself of this opportunity of thanking all his contributors without whose wholehearted co-operation and assistance this volume could not have been produced, let alone within a year of the conference, and hopes that his own efforts on their behalf will compensate them for any editorial pressures he may have had to exert. Many thanks and warm appreciation are also expressed to Miss Beatrice de Cardi and her staff, for the quiet efficiency which ensured the great success of this conference; to Lady (Aileen) Fox, Professor S. S. Frere, and Mr. M. Todd who, together with some of the contributors to the conference, chaired its sessions and led discussions; and, last but not least, to the many fellow-workers, friends and colleagues in the study of Romano-British coarse pottery whose work, unstintingly shared, is incorporated in the contents of this volume.

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INTRODUCTION AND NOTES ON THE POTTERY OF THE FIRST CENTURY A.D. IN USE BY THE ROMAN ARMY

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MANY British archaeologists depend a great deal on pottery for their dating evidence. This is especially the case of the Roman period where a wide range of vessels was in use in the kitchen, the larder and the dining-room. The excavator of this period is likely to become embarrassed by the sheer quantity of sherds. Coins appear to have a greater value since they can be precisely dated, but the life of particular issues and values varies greatly. To date a deposit securely by coins, at least 10 or 12 are required, and this is rarely possible. Pottery on the other hand was in regular use and was normally broken and discarded within 10 or 15 years of its manufacture. Exceptional pieces, such as a dinner service and storage vessels may have lasted longer with less use and extra care in handling. Since large assemblies are collected from most deposits, pottery thus offers a better dating medium than coins if it can be properly assessed. There is, however, a further difficulty due to the displacement of material in the course of building and levelling up on most sites. It is common to find in the third and fourth centuries layers that more than half the pottery has come from earlier deposits.[1] It is very rarely that one finds a layer which is wholly contemporary. The best examples are destruction deposits and waster heaps from kilns. These give a range of vessels in use at the time of the disaster or made by a potter with a narrow range of time. Normally, an occupation site produces a wide scatter of pottery from most of its layers, much of it out of its original context and this of course applies equally to coins.

Bearing in mind these reservations, it is all the more essential that the excavator should know as much as possible about the pottery he or she finds. Although a vast quantity of Romano-British pottery has been published, very little of it is in well stratified and securely dated groups. But even with the help of these, caution is needed since the pottery varies greatly from one district to another. Knowledge of the wares of a particular site may be of little value on another twenty miles away. It is first desirable to consider the development of the industry and its condition during the period.

Pottery was in common use in the late Iron Age but the vessels were restricted to drinking vessels, bowls and jars for storage and cooking. There are great variations which at one time were thought to have been due to cultural differences between the tribes. Doubt has been thrown on this recently by Dr. David Peacock, of the University of Southampton. Mineral analysis of the Iron Age pottery of the West Midlands has shown that much of it was made in the Malverns and was distributed widely in Herefordshire and Shropshire (Peacock, 1969b, 414-27). The same applies to the pottery of the finely decorated wares of the south-west, known as Glastonbury ware (Peacock, 1969a, 41-61); thus, some groups of potters seem to have made and distributed their wares regardless of tribal boundaries. This may be found to be true of other areas when more

[1] This receives a comment by Professor S. S. Frere in his Verulamium report (Frere, 1972, 9-10) with an explanation that the large amount of residual pottery was built into the brickearth daub of the timber buildings.

detailed studies have been made. An exception may be the Iron Age pottery of Dorset and Somerset which is quite distinctive and includes vessels such as tankards and jars with lattice decoration which are not found elsewhere and the distribution of these wares does seem to conform to the area of the Durotriges (Brailsford, 1958, 101-19). Another group of very distinctive pottery is found in the south-east, especially in Kent and some areas north of the Thames, this is the so-called 'Belgic' pottery. These fine vessels were made on the wheel and are clearly derived from types made in Britain prior to the Roman conquest (Birchall, 1965, 241-367), and it seems possible that some of these wares were still being made at the Roman invasion period. None of the pottery of the Iron Age in Britain appears to have been made in the kind of kiln sunk into the ground typical of the later periods, as none has been found. Potters were using at that time and during the occupation a type of surface kiln, remains of which are merely burnt patches and these have now been recognized in several places (see p. 149 below).

There was a modest trade in pottery, as also in glass and metal ware, from Gaul prior to the Roman invasion, but it is doubtful if the quantity was ever great and its distribution seems to be confined to the south-east.[2] There has been a tendency of recent years to consider that some wares previously attributed to this period should now be placed in the post-conquest period. The wares at one time thought to come exclusively from Arretium in N. Italy, for example, are now seen to consist of varieties which include the so-called 'provincial Arretine' made in Gaul. There are certainly pieces from Italy found in Britain which came in as pre-A.D. 43 imports, but the discovery of sherds from the military levels on the site of the Fishbourne villa make it reasonably certain that wares from Italy were still in circulation and there were also provincial types imported during the conquest period and later (Cunliffe, 1971, 260-4; there is also a notable group of Lezoux ware, p. 266).

The coming of the Romans and in particular the army in A.D. 43 revolutionized the pottery industry, as it did other aspects of British life and economy. The army, the administrative staff and traders who came in their wake needed immediately vast quantities of pottery of better quality and greater variety of shape than the Britons could supply. There were two vessels new to Britain, the mixing-bowl or mortarium and the liquid-holding flagon, in addition to the fine wares for the dining table. The new demands were met in various ways. There was a flood of imports mainly the red-gloss samian, mainly from Southern Gaul, and the fine small drinking cups and bowls in cream ware with dark greenish brown shiny colour-coat, many from Lyons and other centres (see pp. 26-7, below), There were also the lead-glazed wares from St. Remy-en-Rollat with their soft apple green colour. The British potters responded as best they could, but many could do no more than produce the traditional wares which they were accustomed to, but in greater quantity. On many of the Claudio-Neronian military sites one finds that 70-80 per cent. of the pottery used by the soldiers consisted of these crude but serviceable wares for cooking and storage. These local Iron Age sherds are indistinguishable from those on purely native sites prior to the conquest, and this is especially true of Dorset where two forts have been extensively excavated, Hod Hill (Brailsford, 1962; Richmond, 1968), and Waddon Hill (Webster, 1960b). In this area, too, there is a Claudian kiln at Corfe Mullen producing flagons (Calkin, 1935), but whether this is a native or a Gaul at work or part of a military works depot it is difficult at present to assess.

[2] The oft-quoted statement of Strabo (Iv, v, 2) has to be seen as Augustus propaganda aimed at excusing the failure to follow up the achievements of Julius Caesar.

Potters also followed the army and took their own ideas with them. This led to a spread of so-called 'Belgic influence' into the Midlands and Gloucestershire. This has sometimes thought to have been due to the expansion of Catuvellaunian influence. But, as in the case above, it is very difficult to be sure one is dealing with a pre- or post-A.D. 43 situation. A site which illustrates this problem is Bagendon, near Cirencester (Clifford, 1961). This is a Belgic type oppidum but much of the pottery found in the excavations offers striking parallels with that from Camulodunum (Hawkes and Hull, 1947). This led the excavator to conclude that there was a strong trade link between the British capital and Bagendon in the first half of the first century A.D. Of the six periods recognized stratigraphically at Camulodunum only the first was considered to be pre-A.D. 43 and dated to c. A.D. 10-43. The thirty years is too brief a period of time in which to notice much change in the coarse pottery, and the great mass of it is virtually indistinguishable from the types and wares used by the Army. The only significant pieces are the various 'Arretine wares' and only five pieces were thought to have the characteristics of real Arretine. Since 1947, the date of the publication of *Camulodunum,* more examples of these wares have been found, and it would be interesting to have a new assessment to see how many of the Camulodunum pieces would now be considered as pre-conquest. Mr. Hull, in writing the chapter on 'The Red-glazed pottery found at Bagendon' (Chapter IX) showed great care in defining the various types of ware, and the pieces which he could definitely ascribe to the pre-Claudian period are very few indeed. Doubt is thus thrown on the claim that trade was extensive in pottery prior to the conquest.

If the Roman fort is found at Irchester, Northants, it may raise a doubt as to whether the pottery published as Belgic from recent excavations is pre-A.D. 43 or later (Hall and Nickerson, 1968, 80-90). Period ciii is certainly post-conquest since it is associated with South Gaulish samian. A more realistic view of pottery for the same area is taken by P. J. Woods (Woods, 1969, 8-9). The Neronian fort at the Lunt, near Coventry, occupied c. A.D. 60-80 has produced a large quantity of coarse native type wares evidently the product of potters working nearby to supply the army needs (Hobley, 1969, 85-104). It is noticeable in this group that the Belgic characteristics have become much weaker.

Where, however, there are legionary bases the situation is different. At Wroxeter, where one appears to have a legionary base c. A.D. 56-90, the pottery from the military levels is of a fairly high uniform quality, the vessels are all well baked, thin-walled and lack the thick coarse characteristics of the native tradition. The small quantity of pottery so far recovered from Lincoln appears to be of a similar quality.[3] The discovery and subsequent investigation of the large fort at Longthorpe on the Nene[4] has led to the suggestion that Lincoln may not have become a legionary base until *c.* A.D. 65. A native site adjacent to the Longthorpe fort has produced kilns making pottery probably intended for Legio IX (information kindly supplied by the excavators Dr. J. P. Wild and Geoffrey Dannell). The Flavian kilns recently investigated at Gloucester were producing fine mica-dusted wares, but they date from the close of the military occupation,[5] and it is not yet clear for what market they were intended. The best published collection of Claudian-early Flavian pottery is in the Camulodunum report. As indicated above, most of these wares are post-A.D. 43, and represent the pottery made first for the large

[3] Very little pottery has been recovered from the fortress levels and published apart from a small group, 1941-42 excavations (Webster, 1949, Fig. 2).

[4] *J. Roman Stud., 55* (1965), 74-6.

[5] Report by Mr. Bernard Rawes forthcoming in *Trans. Bristol Gloucestershire Archaeol. Soc.*

military base and then for the early colonists. It is almost all Belgic and Gallo-Belgic with many grades of imitation and much of it presumably made locally.

In spite of all this it does not necessarily follow that the legions had their own depots at this date. Since there is certainly no evidence of military tile works in Britain in the first century. None of the stamped tiles once associated with the early Roman advance can be proved to be of this date. Some indeed are certainly second century (Webster, 1960a, 51, fn. 1.), and it must be presumed that the tile works were established to provide the building material needed in the conversion of the forts and fortresses from timber into stone which began under Trajan (Frere, 1967, 124-5. The inscriptions are all from gates, and it is probable that it marks only the improvements to the defences. The vast rebuilding programme may have come later.) The conclusions drawn from what is at present a rather small body of evidence are that pottery associated with legionary bases seems to be of better quality and has a uniformity of character not applicable to that found with auxiliary units.

We know far too little about the pottery of the Claudio-Neronian period on civil sites for any satisfactory deductions to be made. Much here depends on the spread of the policy of Romanization which implies the setting up of centres of administration and justice and of markets. The most sophisticated living conditions are to be expected in the communities established by the Romans. The one example we know is at Colchester where a *colonia* or settlement for army veterans was set up about A.D. 50; only ten years later it was ruthlessly destroyed by the Britains under Boudicca. Excavations especially in the western part of the Roman city have produced evidence for the destruction in the form of burnt daub from the timber buildings. One of the most interesting discoveries was that of a pottery and glass shop or store in the rebuilding of Jacklin's cafe in 1927-29 (Hull, 1958, 153-8). Unfortunately, only a small part of the site could be investigated, but a great quantity of broken pottery and glass was recovered by the Museum. The earth was loose and so full of it that when touched it all fell out 'in a tinkling shower'. Most of the pottery had been burnt and the glass fused together in shapeless lumps, sometimes having solidified on the floor. The most extraordinary vessel was a *rhyton* or drinking cup in the form of a human head in very thin ware with a shiny brown colour-coat, probably from the Rhineland. All the sherds were very fine ware evidently intended, like the glass, for the dinner table.

It seems likely that elsewhere Romanization did not get under way until the Flavian period, but there are exceptions. At Verulamium there are indications of planning and a row of timber buildings sharing a common portico front was destroyed in A.D. 60 (Frere, 1972). The very destruction of Verulamium by the Britons indicates a strong pre-Roman element in the population of the city. The receipt of municipal honours under Claudius may have been in recognition of services rendered to the Roman cause. The destruction was thorough and according to Professor Frere it was at least fifteen years before rebuilding was started. The Forum then built just before or during the governorship of Agricola is certainly more Gallic in type than the usual stereotype plans of the other British *fora* (Cotton and Wheeler, 1953, 13-97; for the dedication under Agricola : Frere, 1956, 8-10). The recent excavation report deals very fully with the coarse pottery. The fine imported wares of the period of the early occupation, of which twelve examples are selected, may have come from the military site (Frere, 1957, 4-5), although there is some caution in this interim in accepting the rampart as military. The pieces of military metalwork published in the 1972 excavation report although not always identified, clearly show the way this material became scattered over the later town and usually appears out of context (objects Nos. 36, a

cuirass loop, 37-42, 49, 50, 125, 127 are all of military origin). The pottery from the levels up to the Boudiccan destruction clearly shows the amount of local Belgic influence as we would expect. The only other vessels are flagons, mortaria, imitation Arretine, samian and Gallo-Belgic wares and the bowl (No. 89) which was soon to become the carinated form with a reeded rim. A local pottery industry was established by the end of the first century at the city itself (Corder, 1941,271-98), and nearby at Radlett (Page, 1898, 261-70) and Brockley Hill (Applebaum, 1951, 201-28; Richardson, 1948, l-23). Elsewhere Romanization seems to have been a slower process and there were many centres like Exeter, Cirencester, Wroxeter and Leicester still under military occupation, probably until c. A.D. 76 and in the case of Wroxeter even later.[6] The two other *coloniae* at Lincoln and Gloucester were not founded until the very end of the first century.[7]

The establishment of these new groups of consumers and markets would have attracted potters; Lincoln it is known became an important production centre.[8] Too little is yet known about Gloucester, but it may be significant that the Severn Valley wares which by the mid-second century spread as far north as Wroxeter may have originated at the *colonia,* where at one time they were known as Glevum Ware (Green, 1943, 15-28), one of the main products centres was near Malvern *(W. Midlands Archaeol. News Sheet,* No. 12, 1969 and preceding numbers),

[6] The fact that the construction of the fortress of Leg. XX at Inchtuthil in Scotland was not completed demonstrates that the old base at Wroxeter was retained until as late as A.D. 86.

[7] Lincoln probably late in the reign of Domitian (Richmond, 1947,64-5); and Gloucester under Nerva in A.D. 96 *(Ibid.,* 70). These foundations may have been associated with the military reorganization following the withdrawal of Leg. II *Adiutrix.*

[8] Admittedly most of the evidence points to an industry in the third and fourth centuries. Over a large area at Boultham, south-west of the city, kilns and wasters have been found but ill recorded; this area has almost all been built over. Swanpool (Webster, 1947, 61-9) is presumably an outlier of this centre. The earliest kiln was that on the site of the Technical College, This produced mortaria of the early second century stamped by Vitalis *(J. Roman Stud.,* 27 (1937), 233); the Antonine kiln on the race-course found in putting in a post is probably one of a group to the west of the city (Corder, 1950).

POTTERS' STAMPS ON TERRA NIGRA AND TERRA RUBRA FOUND IN BRITAIN

VALERY RIGBY

INTRODUCTION

THE present paper is a summary of a study of potters' stamps on *terra rubra* (TR) and *terra nigra* (TN). The pottery examined was from British collections and excavations; Continental material has been studied mainly from published sources and so is excluded from this discussion. However, the British material has provided a compact and fairly representative sample for experiments in methods of deciphering, identifying, recording and classifying stamps, fabrics and forms.

The long-term aim of the project is to produce a chronology for the work of each potter, not just the approximate dates of his working life. A potter used several different dies to stamp his name or mark on his own products. Each die has special characteristics of size, letter formation and spacing. By identifying stamps made with the same die and by examining their provenances, it may be possible to distinguish dies which belong to particular phases of a potter's working life, and this would make the stamps a more accurate aid for dating pottery groups. In addition, the dies of different potters can show common characteristics in style which further research may show to be the result of regional, economic or chronological causes. With this information, a clearer picture of the origin, expansion and decline of the manufacture of TR and TN will emerge and its relative importance within the Gallo-Belgic (GB) pottery industry become apparent.

The main source of information about TR and TN in English is *Camulodunum* (Hawkes and Hull, 1947,202 ff.). In a short introduction to the section on 'Gallo-Belgic and other Roman Wares', the influences which affected the style and development of the industry are considered, with a brief account of the causes of its decline. Material for more detailed study of the topic is provided in lists of kiln sites and major collections excavated before 1940 in France, Germany, Holland, Belgium and Luxembourg. The forms and TR fabrics are classified, but it is not comprehensive since the study is based on the pottery from one site, supplemented where necessary by complete profiles of vessels from other sites. Despite its limitations, the classification of forms is in general use in Britain, and it was used in the early stages of the present project.

In a short paper called 'The Distribution of Terra Nigra in Great Britain', which includes a gazetteer of sites, mainly from published sources (1966, 27), Lloyd R. Laing questions some of the premises in the *Camulodunum* summary.

GENERAL BACKGROUND

In pottery reports in Britain, stamped TR and TN vessels are grouped under the heading of 'Gallo-Belgic Imports'. The term Gallo-Belgic is used geographically and chronologically for pottery made and chiefly marketed in Gallia Belgica, and in Germany during the early period of Romanization in the last two decades of the first century B.C. There has been some controversy over a generic term for the industry as a

whole and two have emerged, while Gallo-Belgic is used in Britain, in Continental publications it is referred to as the Belgic pottery industry.

The vessel types of the GB industry were derived from two main sources-the first, imported Italian tablewares, especially Arretine[1] cups and platters, the second, indige-

[1]For the purposes of this paper, Arretine includes the products of both Italian and provincial workshops.

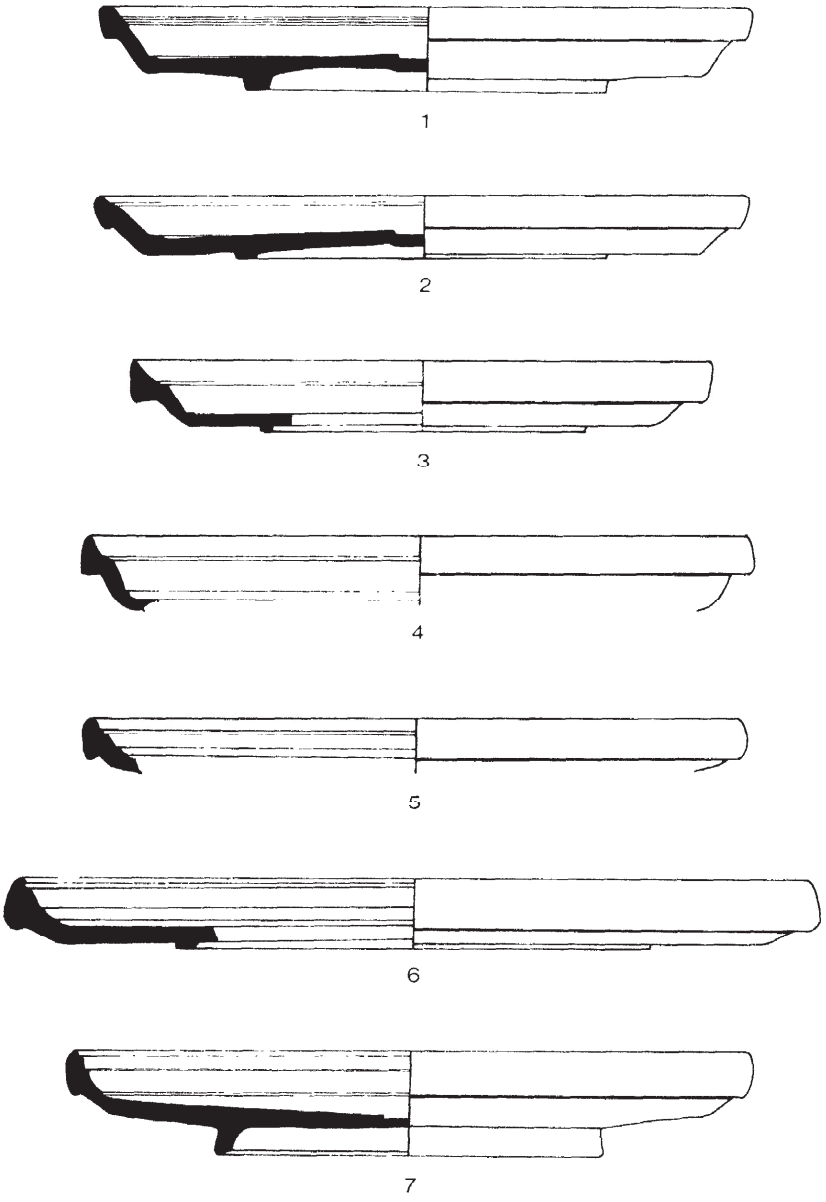


FIG. 1. Platters in TR and TN. (Scale: ½).

nous La Tène III forms, and when these forms are decorated, the patterns were copied. Some were remarkably exact copies of their prototypes, even down to the use of potters' stamps. Apparently, vessels with stamped prototypes were more likely to be stamped themselves, so certain cup and platter forms in TR and TN were stamped while others with unstamped originals, were not. The manufacturing techniques were Roman and were designed to produce standardized vessels in large quantities. A considerable degree of control of temperature and amount of oxygen in the kiln at the critical cooling stage was necessary to produce a successful kiln load. Fabrics whose surface colours vary from silver grey to blue/black and which were fired in a reducing atmosphere are called TN; those fired in an oxidizing atmosphere throughout and whose colours vary from creamy white to dark red, are called TR.

TN is easily distinguished from other contemporary fine-wares by its colour. In early pottery reports, before the general term *terra nigra* had been coined, it was classified and described according to the tone of its surface colour, e.g. black, blue/grey and grey wares. Although TN is now widely accepted, its use is still not universal, and the earlier method of classification is sometimes employed.

The direct relationship of TR and TN was obscured by the former's similarity to 'Arretine' wares; as a result of the confusion, TR was classified and described as 'orange-red *terra sigillata'* in the report on the pottery from the cemetery at Andernach (Koenen, 1880, 160). Once it had been demonstrated that it was related to TN, not *terra sigillata,* it was classified and described as 'light red ware' or 'orange-red ware'. Apparently the term *terra rubra* originated much later than TN and as, with TN, it is sometimes omitted, the fabric being classified and described by its surface colour.

GB potteries are listed on page 203 of *Camulodunum,* but only a few have produced evidence that stamped TR and TN were amongst their products and these include Sept-Saulx, Courmelois and Thuisy—grouped near Rheims, and Trier, Metz and Kobern situated in the Moselle valley (for the kiln at Metz, see Reusch, 1943, 146). On present evidence only Sept-Saulx was an important supplier of TN to the British market. Vertault, an outlier sited farther south on a tributary of the Seine, may prove to have been a very important pottery. No kilns have yet been located there, but a group of 410 stamps, representing 27 potters, was found in a single deposit composed entirely of TR and TN cups and platters (Bohn, 1922, 123). Stamps of eight of these potters have been found in Britain. At least one of them is known to have worked at Sept-Saulx at some time during his working life.

Cup And Platter Forms

Problems arose during the recording of the stamps which made it necessary to reconsider the classifications of both the vessel forms and of TR in *Camulodunum*. ***No*** alternatives are offered here because it is obvious that no comprehensive systems are possible until the finds from the kiln sites and major Continental collections have been examined, but certain comments can be made.

The range of vessels in TR and TN is more varied than the *Camulodunum* classification of 16 platters and six cups implies. The system is based on a small number of forms some of which are then divided into sub-types and has the advantage of stressing the similarities shared by some forms, especially those with 'Arretine' prototypes which, therefore, are grouped together using similar criteria as those chosen to classify the *terra sigillata* from Haltern (Loeschcke, 1909, 128). However, more recent stamped examples suggest that several sub-types, especially those grouped together as Forms 6 and 7, should be regarded as separate forms.

According to the *Camulodunum* classification, platters 1 to 7 and 10 are all variants of the same Form 7, but this overlooks important differences of detail in the moulding of their walls. At least three, platters 5, 7 and 10, are not variants of a single basic design, but follow closely their respective, 'Arretine' prototypes. The moulding of the remaining platters, with no exact prototypes, is sufficiently different and recurs frequently enough to conform to definite, individual patterns rather than merely variations on a single basic design. Certain patterns of moulding are known to be the products of specific potters and this should be considered when any system for the classification of forms is being evolved. Careful identification of the type of moulding is important since it follows that some rim forms are more closely datable than others,

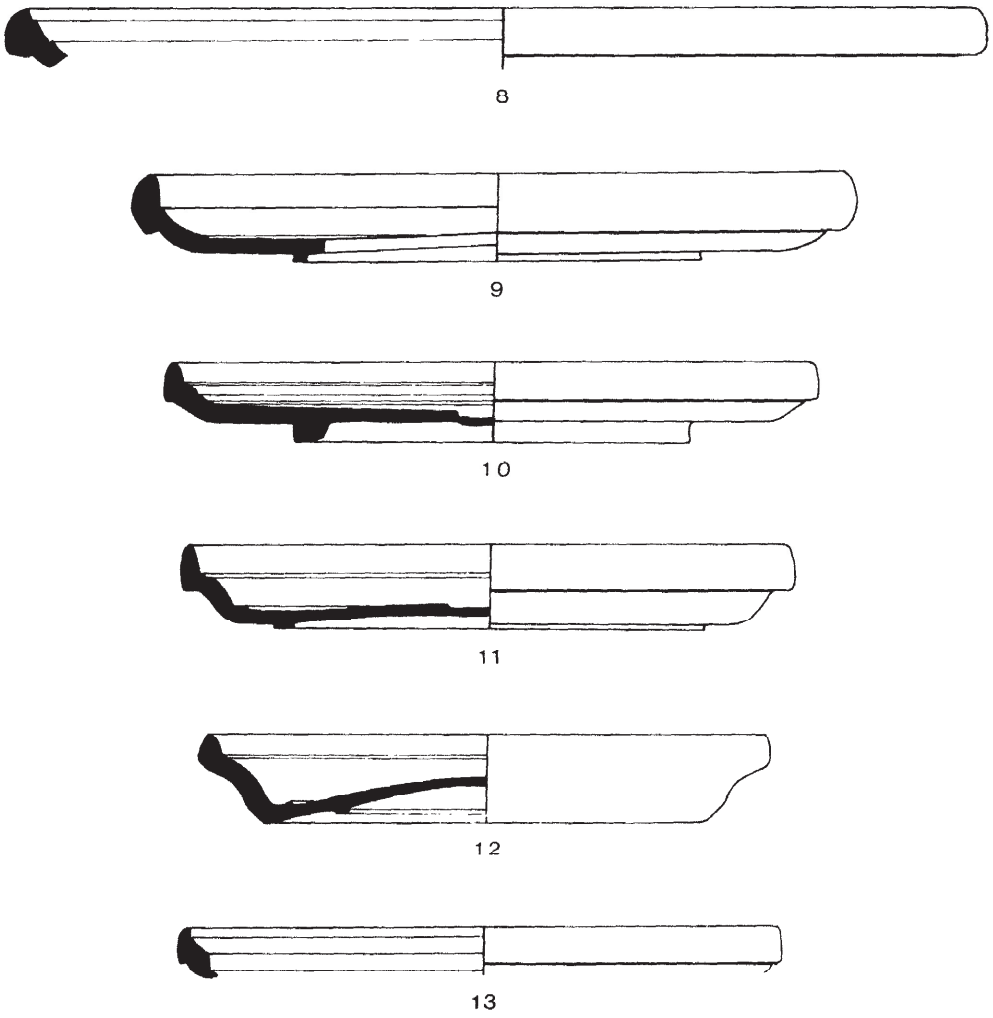


FIG 2. Platters in TR and TN. (Scale: ½).

Potters making cups and platters in TR and TN appear to have been selective in the forms which they copied; Arretine designs did not provide all the prototypes nor were all Arretine designs copied. Platters 14 and 15 have a fairly long history in southern Gaul following the import of Campanian wares from Italy in the third century B.C. (Hawkes and Hull, 1947, 202). It may be significant that platters 1, 21 and 22, for which no exact prototypes have yet been identified, occur in TR at the Augustan fort at Oberaden along with the Arretine prototypes of platters 5, 10, 17 and 26; there are no examples of the latter in TR and TN on that site. The most popular cup form in Britain was 37, in both large and small versions. It may be related to the Arretine cup Haltern 8b, but there is a much closer copy in TR, Haltern 78b, which has not been identified in Britain (Loeschcke, 1909, 272). In contrast cups 43 and 34, 35 and 36, which are rare in Britain, have all close parallels in Arretine wares and occur at Oberaden in both TR and Arretine, while cup 43 is the commonest form in TR.

Though TR and TN potters copied faithfully some details from their Arretine prototypes, others were discarded. The most notable difference was the replacement of the tall, grooved foot-rings by plain, shallow ones. Two features were preserved which the later South Gaulish samian industry dropped, the use of double-line stamps and marks and the arrangement of single-line stamps, usually three or five, radially on the bases of large platters, sometimes with a central one as well.

TR AND TN FABRICS

The analysis of a small amount of TR and TN has been undertaken using finds from the cemetery at Blicquy (Hainault, Belgium). It showed that clays of similar composition had been used for both, that a slip had been applied to the upper, visible surface of the TR but not to the TN and that the colour differences were due to the firing conditions and not to the composition of the TR slip (De Laet and Thoen, 1968, 4).

From observation, the variation in paste, texture and colour appears much greater in TN than in TR, and it may be necessary to analyse pastes and finishes in order to determine the criteria for classifying varieties of TN and also TR.

TERRA RUBRA

The division of 'true' TR into two varieties which were used for cups and platters proved inadequate for swift and standardized recording. Amongst the material examined there are four varieties, and if they are fitted into the *Camulodunum* classification without the use of sub-types significant differences are obscured.

TR 1(A)—has a fairly sandy paste, with sparse red grits; its colour is very pale—off-white, cream or pale pink. A dense red slip covers the upper surface and rim; some examples retain traces of the original highly polished finish, others are matt. Below the rim, the exterior surface is self-coloured, often streaked with pink from the grits and has a matt finish.

Used for large platters like 16, 17 and 21 and cups 35 and 43, no stamped examples have been found in Britain but they do occur sometimes on the Continent, usually in late-Augustan contexts.

TR 1(B)—has similar looking pastes to TR l(A), but the red slip covers the whole of the completed pot.

Used for small platters like 2,4, 5 and 13 and cups 34 to 38 and 43, the walls tend

to be rather thin so it is more friable than TR 1(A); it is usually stamped, Platter 2 is stamped VRITVES/CИCOS (Fig. 7, 48); cup 38 is stamped SCAN/ETI.

TR 1(C)—has a fairly sandy paste, with some red grits and is red or orange in colour, with a darker red slip covering the upper, visible surface and rim. Like TR 1(A), the exterior below the rim is self-coloured and smoothed, but not to such a high polish as the upper surface.

Used for almost all cup and platter forms, it is the most common variety of TR found in Britain; it is usually stamped. Platter 1 is stamped ACVTVS (Fig. 7, 41); platter 10 is stamped DVROTIX.

TR 2—has a dark orange or red paste, with some red grits and is fairly sandy in texture, for TR can be quite coarse-grained. The surfaces are self-coloured with a highly polished finish on the upper surface and rim which sometimes extends over the whole pot; otherwise, the exterior, below the rim, has a matt finish. This variety of TR is especially liable to flake.

Used for small platters like 3, 4, 6, 7, 11, 12 and 24 and cups 36, 37 and 40; it is usually stamped. Platter 7 is stamped DANNO/MAROS (Fig. 7,47); cup 37 is stamped SCANET and was made by the same potter as cup 38.

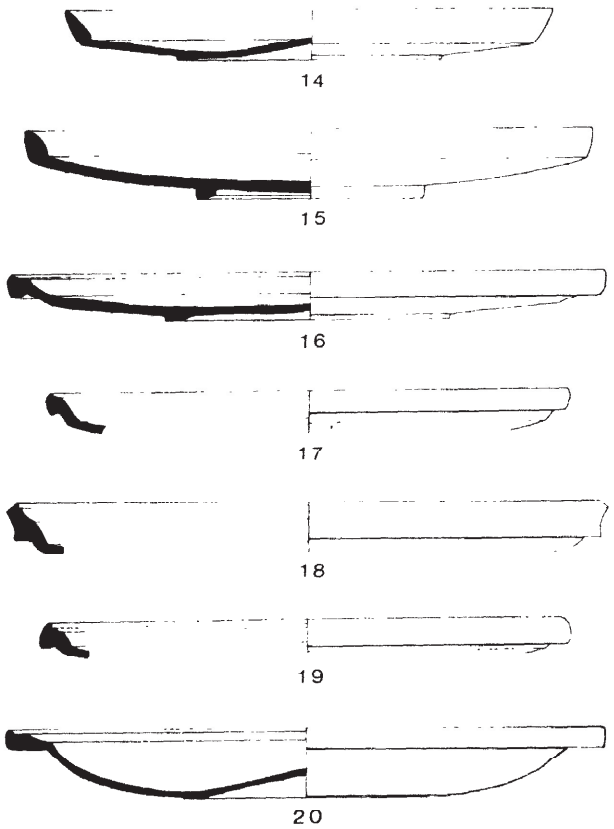


FIG. 3. Platters in TR and TN. (Scale: ¼.)

Terra Nigra

The possible combinations of colour, texture and degree of hardness are so numerous that the isolation of specific varieties of TN is difficult.

The paste can vary from very fine-grained and close-bodied to fairly coarse-grained and open-bodied; smooth to fairly sandy and rough; the fine-grained pastes tend to be among the hardest and the softest, the latter tend to flake under certain soil conditions so destroying the surface finish. Pastes show every degree of colour variation from blue/white to a fairly dark blue-grey; in some examples the paste is red, orange or brown. The surfaces can be any shade of grey, usually with a strong bluish tinge to it, the limits of the range are silver grey to dense, blue/black; variations as great as this can occur on a single vessel. Like TR, it is the upper, visible surface and rim which are given a highly polished finish that sometimes extends over the whole vessel, excluding the area within the foot-ring; otherwise, the exterior, below the rim, is smoothed and, consequently, lighter in colour.

The colour of the paste cannot be used as the sole criterion in deciding whether a fabric is 'true' TN or not. Whatever the paste or its texture, the same dense, blue/black and highly polished finish could be achieved; however, it appears that a fairly dark paste is usually coupled with the darkest possible blue/black surface while very light pastes tend to be associated with fairly light-coloured surfaces. Fine-grained, blue/white pastes tend to be soft and powdery, with surfaces that wear rapidly allowing the paste colour to show through. Some potters seem to have been able to produce a standardized TN, but others were far more variable in their results. Stamps from the same die are found on TN vessels which are completely different in colour, texture and hardness, and it is not clear if these differences in quality are deliberate or accidental results in the firing processes.

A few vessels show the use of a darker-firing slip like TR 1(A) and (C). Platter 7 is in slipped TN, the paste is hard, fairly fine-grained and sandy, with some grey grits. The slip covers the upper, visible surface and rim and has a highly polished finish; below the rim, the exterior is self-coloured and matt. It is stamped TORNOS/VOCARI F(ECIT), the same die occurs on cups and platters in more orthodox varieties of TN (Fig. 7, 46).

Another clearly recognizable variety of TN is that with a mica-dusted finish. The forms are slightly different from those of conventional types of TR and TN and they are never stamped (Fig. 5). The surface finish apparently deteriorates rapidly under most soil conditions, so it is difficult to visualize its original appearance, but on better preserved examples, the mica shows as a fairly dense scatter of individual flakes not a complete coating. The paste is light in colour, sandy and coarser-grained than usual for TN. In the absence of stamps, the exact connection between mica-dusted TN and the more usual varieties of TN is not clear, so it is left out of the discussion in company with 'Pompeian Redware', another highly micaceous fabric. Although numerous examples have been found in Britain, none is stamped and since the platter and lid forms are not found in TR, the connection 'Pompeian Redware' and TR is not clear; so it also is excluded.

Stamps found in Britain

TR and TN have been identified on 85 sites and stamps occur at 50 of these. To date, the total number of stamps recorded is 751, of which 560 are recognizable names and the remainder illiterate marks. Since the name stamps were impressed from 300 different dies, it means that, on average, each die is represented by less than two stamps

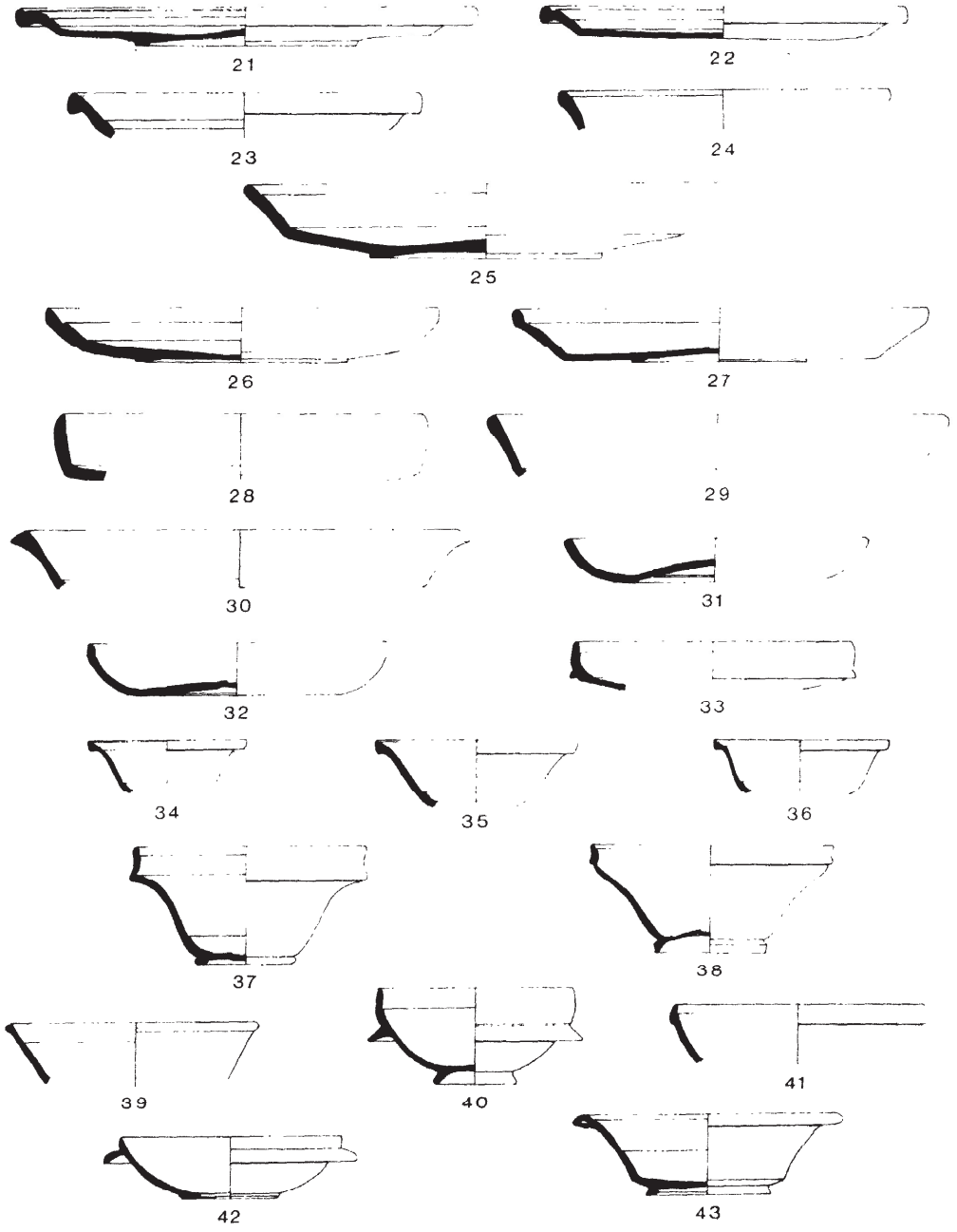


FIG. 4. Platters and Cups in TR and TN. (Scale; ¼.)

which cannot be an accurate guide to the working life of a die. There are 193 different names, so each potter is represented by an average of 2.9 stamps. From these figures, it appears that consignments of TR and TN imported into Britain consisted of the products of a large number of different potters, each of whom supplied only a small quantity; a study of individual potters rather modifies this idea.

Judging from his stamps, Julios was a major exporter to Britain, with nearly 6 per cent of the market. His products occur in nearly all the larger collections, and he was no less successful on the Continent. His output illustrates most of the characteristics of TR and TN production in general.

In Britain there are 44 stamps from 27 different dies, all on TN; 18 of his clearest dies are shown on Fig. 6 (1-3, 5-15, 23-26). He made plain platters like 15 and moulded forms like 11 and 21. Small platters were stamped once, in the centre, but the larger ones were stamped three times, radially. As guide-lines for the placing of his stamps on the base, as well as for decoration, he used a combination of rouletted wreaths and concentric circles. He concentrated on making cups like 37, a small version about 9 cm. in diameter and a large one about 14 cm. ; in addition, he did make a small quantity of cups like 40.

His name is rendered in four different ways—IVLIO, IVLIOS, IVLLIO and IVLLIOS, in addition, it was sometimes followed by AV, AVO or AVOI, abbreviations of AVOTIS, a Latin rendering of a word for 'made by' (Hawkes and Hull, 1947, 209). From his stamps, there is the suggestion that, at least for a short time, he worked with another potter-Atesati, who apparently never worked alone (Fig. 6, 2). It seems to have been unusual for two potters to work together to produce TR and TN for there are few stamps showing two different names.

The dies can be divided into five styles based on the letter formation, spacing and other features, but the differences in style do not correspond with those in the spelling. Certain IVLIOS, IVLLIO and IVLLIOS dies are clearly in the same style (8-15), while other IVLIOS dies are in a very different one (23-26), so the question arises of how did these differences occur. All the dies may belong to a single potter, Julios, who had them made by different die-cutters when he needed them. All may have been in use at the same kiln site or Julios may have had kilns at more than one pottery, for three sites have been suggested for him—Sept-Saulx, Vertault and Trier. Alternatively, the different styles may denote a number of individual master potters, each of whom made his own dies or commissioned them from a die-cutter. Possibly all the dies were the products of a single die-cutter working over a long period, whose style was influenced by dies used by other potters, perhaps because his production centre was transferred to another region where a different style in die-cutting was in current use.

A study of the dies of the potter (or potters) Julios raises the question of whether or not there were specialist die-cutters whom other potters could commission to make their dies. The task required both literacy and skill to produce a die which would make a correctly facing, clear impression when stamped on a vessel. Although the dies of Julios are not outstandingly good examples of the craft, the double-line stamp IVLIO/AVO(T)I(S), which has to be read from two opposite directions is ingenious, correct and clear (Fig. 6, 1). Some Julios dies share more characteristics with those of Illos and Sollos than they share with the remainder of his own dies (Fig. 6, 23-26, 27-31). The sharing of stylistic features by the dies of different potters is quite common and suggests that they did share the services of specialist die-cutters. An alternative possibility is that as a result of regional groupings a particular style was followed by a number of potters, and it may be significant that not only are their dies similar but the

potters' names and abbreviations are similar also. There is a close resemblance between the dies of Canicos and Nonicos, with the shortened versions CANIC and NONIC (Fig. 6, 16-20 and 22). In the same way, VELVCNIo, VERIIAMo and VERo—surely a shortened form of Veriiamo—are closely related, the forms of certain letters being identical, while VISEROS and LVLLO:S also share certain characteristic letters (Figs. 6, 27, 32, 34-36).

In Britain, Acutus is represented by 16 stamps, from nine dies and they pose the same problems as Julios, in particular whether or not they belong to a single potter and if they were made by specialist die-cutters. The most common die is ACVTVS which occurs six times, all on TR platters, at Braughing and St. Albans (Herts.), Kelvedon and Colchester (Essex) (Fig. 7, 41). It exhibits features in the die-cutting which set it apart from the remaining dies of Acutus (Fig. 7, 37-40). The letters are more carefully shaped, with no accidental tapering and no gaps where strokes join, they are cut to an even, shallow depth. Considering the small size of the face of the die, such letters required great skill to cut.

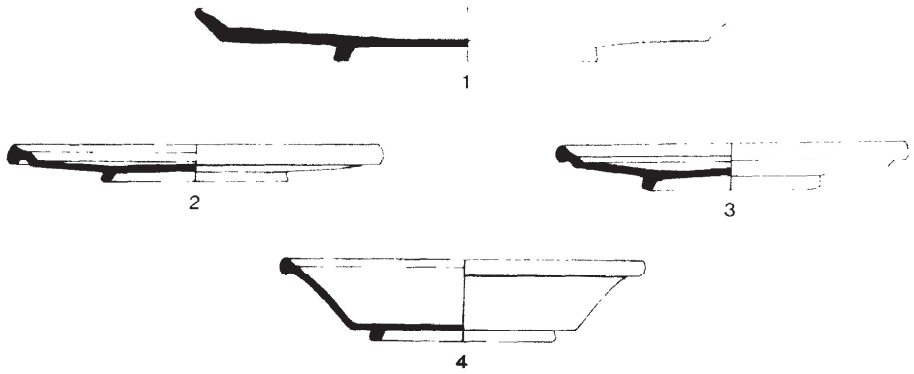


FIG. 5. Platters in Mica-dusted TN. (Scale: ¼.)

There are dies from several other potters which are of an equally high standard—ATTISSV, DANN, DANNO/MAROS, DVROTIX F(ECIT), SMERT/VCCOS, TORNOS/VOCARI F(ECIT) and VRITVES/CI CIИCOS (Fig. 7, 42-48). Tornos and Vocaros are exceptional since when they were working together, they appear to have produced only TN. The TR of Acutus, Attissu and Durotix looks to be closely related as does that which is stamped with the DANN die; however, the fabric of the platter stamped DANNO/MAROS is of a very different variety. Only Acutus seems to have adopted the Latin ending -VS on his dies. It is not known at what stage in his working life this occurred and whether other versions were in use at the same time. As far as British finds are concerned, the version with the -VS ending is the most common; in contrast, on the Continent, it is fairly uncommon. In general, the use of the -VS ending is quite rare and, like Acutus, those potters who adopted it used other endings as well during their working life.

No kiln sites have been discovered for the potters named above, and the examination of more material may show that there is no obvious link beyond the similarity of their dies, but their high standard is remarkable and unusual. It will be of particular interest if they can be assigned to a specific phase in the work of each potter. One stamp

of Acutus was found at Haltern in a late-Augustan context, but the die has not been identified. A stamp from the Attissu die and the stamp DANN were found there also which suggests that they all belong to an early phase in the careers of these particular manufacturers. Other dies of Attissu are neat and bordered, but were made by another die-cutter whose letters are less skilfully shaped and none has occurred in closely dated contexts for comparisons to be made: the same applies to Acutus and Smertuccos. When Tornos and Vocaros were working independently, their individual dies are much less accomplished than those used during their association and were made by other die-cutters. Stamps of the remaining potters are too rare for any comparisons to be feasible.

Two of the few potters to be assigned to a kiln site are Canicos and Medi, who are known to have worked at Sept-Saulx. Together their stamps total 26 on TN and three on TR; the find spots are fairly widespread—Hacheston (Suffolk), Colchester (Essex), Baldock and Braughing (Herts.), Silchester (Hants.), Chichester (Sussex), Eccles (Kent) and Bagendon (Glos.), but are mainly concentrated in the east. Stamps from all Canicos and Medi dies occur at Colchester where the number of finds is 16, which suggests that in the first instance they were imported into Colchester and distributed from there.

Since they both worked at Sept-Saulx, it may be significant that the products of Canicos and Medi are similar in several respects. Both specialized mainly in large platters, like 15 and 21, which they stamped radially and although Canicos did make TR cups, he seems to have concentrated on TN, like Medi. From observation, their TN is almost identical in colour, texture, hardness and finish, which may indicate that there was a Sept-Saulx type of TN.

At present, Medi is unique among TR and TN potters because a die with which he stamped some of his TN platters was used to stamp the rim of a mortarium.[2] The mortarium may have been a single experimental piece, even an accident, but it suggests connection between stamped GB wares and stamped mortaria previously unsuspected. Perhaps the expanding market for mortaria offered scope to potters whose TN markets were beginning to contract and who carried over the tradition of stamping their products into the manufacture of mortaria.

The Distribution of TR and TN in Britain

The material studied includes rims and classifiable sherds from cup and platter forms which are usually stamped. A distinction is made between stamped and unstamped pieces, whilst those known to be from grave groups are distinguished from other finds. It is not yet possible to compare the distribution patterns of the stamps of specific potters nor those of particular potteries.

The largest collection of finds, stamps and sherds, is from Colchester where the total of stamps is 474, since St. Albans, Silchester and Chichester account for 52, 26 and 16 respectively from the total of 751, it follows that stamps are rare on the remaining 46 sites. The difference between the numbers from St. Albans and Colchester is unexpectedly large, but it may be affected by the type of areas which have been excavated so far. Forty-four stamps from St. Albans are from La Tène III type cremation burials, five are from the Prae Wood site and the rest from Verulamium itself. In contrast, only seven stamps are known to be from similar burials at Colchester, the remainder are from the Sheepen site.

Although TR and TN have been identified on only 85 sites, the amount of pottery found is small compared to the total amount of samian, but a study of the material

[2]Information from Mrs. K. F. Hartley.

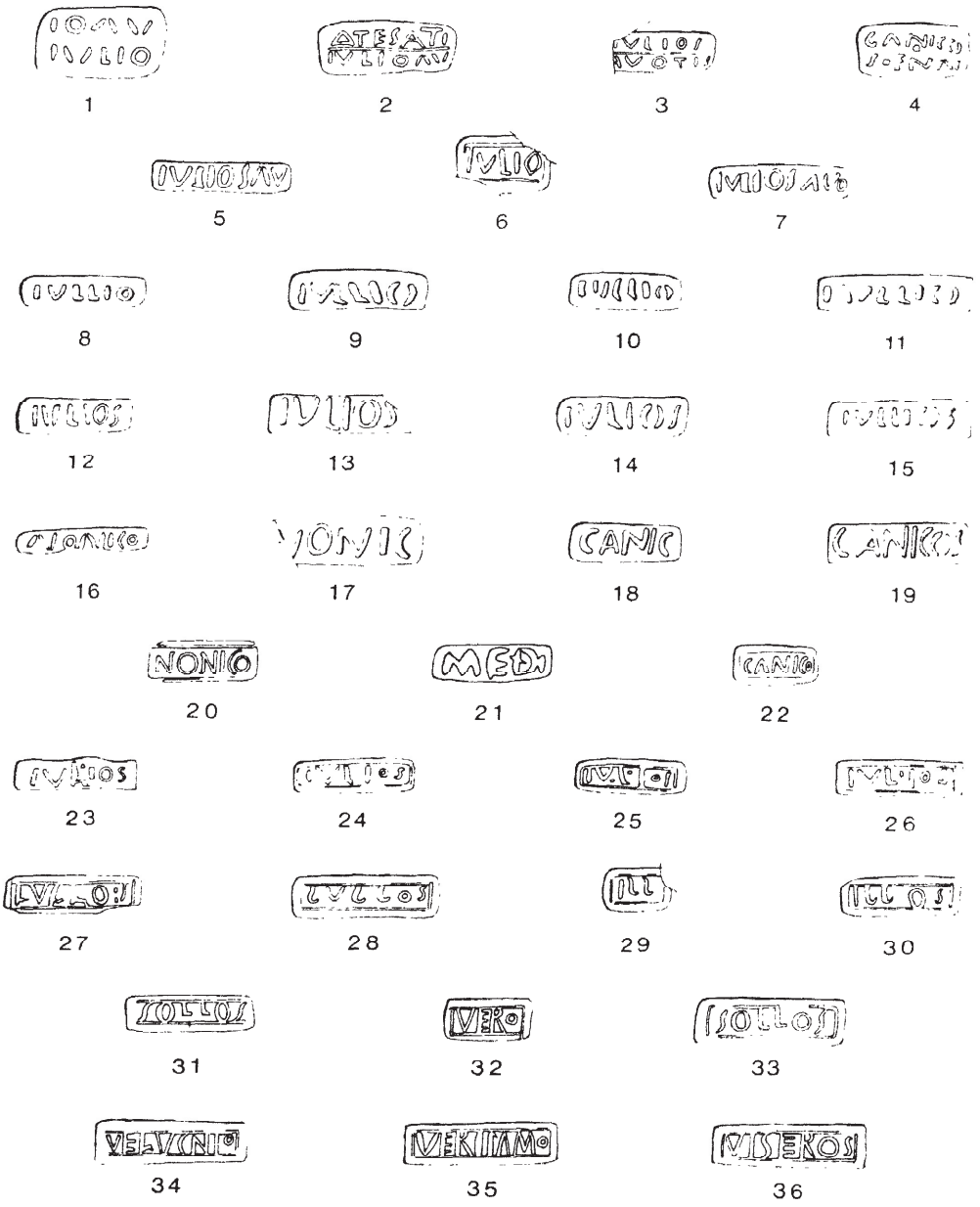


FIG. 6. Potters' Stamps on TR and TN. (Scale: 1/1.)

published in *Camulodunum* is instructive because it provides large quantities of TR, TN and samian which were in use during the same fairly limited period of the first century A.D. for comparison. Including stamps on decorated vessels, there are 55 Arretine stamps and 277 on South Gaulish samian compared to 243 recognizable stamps on TR and TN (certain of the marks shown on Plate XLVIII are on coarse ware). It is difficult to estimate the number of different vessels found on a site, but the 'Chronological Table of the Incidence of Forms', on page 188, gives approximate totals of 250 Arretine and 2,500 South Gaulish, plain vessels. No such estimates are given for TR and TN, but a total of 3,465 vessels is obtained by adding together the totals for Form 1 to 16 and 53 to 56, given on page 277. A comparison of these figures suggests that over the same period in the first century A.D., more TR and TN were being imported than either Arretine or South Gaulish samian. It remains to be seen if this conclusion is supported by evidence from other sites.

Most of the sites and finds occur to the south and east of the line of the Fosse Way. In particular, stamps from burials are confined mainly to an area to the north of the Thames, and this concentration probably reflects the areas which would have received TR and TN soon after its import into Britain began; stamps from other sites extend the distribution pattern up to the Fosse Way. There are short extensions, in a northerly direction through North Ferriby (Yorks., two stamps) to York (one stamp) and in a south-westerly direction from Topsham (Devon, one stamp) to Nanstallon (Cornwall, two stamps). By including unstamped sherds, the number of sites is increased from 50 to 84 which not only fills in the existing pattern produced by the stamps, but

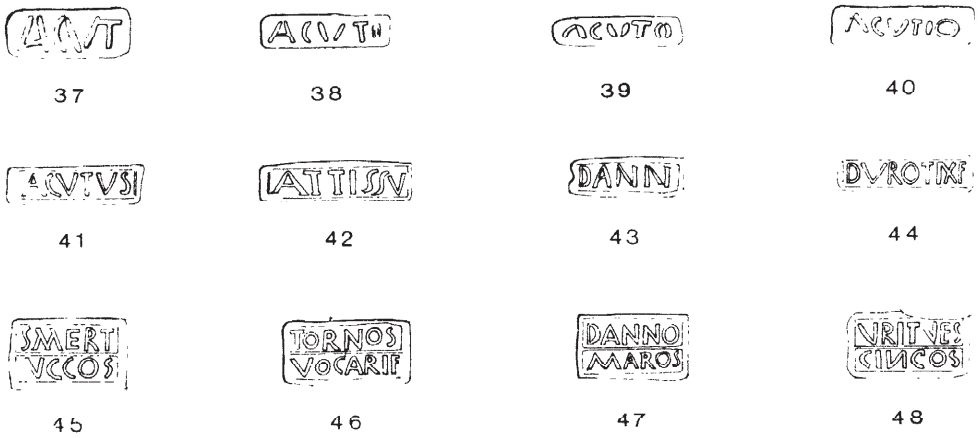


FIG. 7. Potters' Stamps on TR and TN. (Scale: 1/1.)

extends it into Wales and Northumberland, and, as a result, the absence of finds in the west and north-west Midlands is emphasized. More results from excavations in this region are needed to decide whether or not the absence is real; chronologically, there is no obvious reason for such a notable gap.

TR has a more restricted distribution than TN. It has been identified on only 35 sites, with its boundary lying along the line of the Fosse Way. Most pieces are stamped, and it is the unstamped sherds which extend the area. With the exception of isolated finds, on British sites there is always more TN than TR. The largest collections are

associated with oppida sites and native settlements for which a pre-Conquest occupation can be claimed, but the amounts are outweighed by at least five times as much TN. Excavations at the fort at Old Winteringham (Lincs.) produced only three small sherds of TR compared to 56 different TN pots and three stamps on TN. With the exception of Stanwick (Yorks.), no TR has been identified on the outlying sites shown on Fig. 8, all of which are military establishments and were being set up from c. A.D. 50 onwards. It seems that whatever military markets the TR potters had in the early years of the first century A.D., they had lost them by the middle of the Claudian period, probably to South Gaulish samian potters. Certainly with the introduction of improved techniques into the South Gaulish industry, TR could not compete with samian for durability. However, even allowing for survivals, oppida and native settlements appear to receive supplies of TR after the military establishments cease to do so.

TN has a more extensive distribution than TR and has been identified on 76 sites, on 44 of which stamps occur. The main concentration is in the south-east and, as with TR, the largest collections are from oppida and native settlements. Where finds occur beyond the line of the Fosse Way, they follow a pattern—all are from military establishments, the quantities are small, all the finds are in TN and are restricted to three simple forms which were not manufactured in bulk until the Claudian period.

The forms which recur on outlying sites are variants of platters 27 and 31 and cup 40. Some are in a particularly hard and glossy TN, with an extremely durable finish which may be the result of improved manufacturing techniques similar to those which occurred in the South Gaulish samian industry and resulted in a more glossy and hard-wearing product. There was also a change to simple forms which could be made more rapidly, in greater quantity and, therefore, more cheaply than the forms with moulded walls. Whether the changes were due to the attempt to increase production rapidly to satisfy expanding markets for TN or were aimed at countering the competition from samian is an open question, but the developments in both industries must have occurred at about the same time.

Although some TN was more durable, the standard of manufacture had declined. A high proportion of vessels suffered from careless finishing with uneven foot-rings, untidy trimming and matt streaks which marred the exterior and interior surfaces. There are quite a large number of poor quality ‘seconds’ and, coupled with the fact that variants of platters 26 and 27 are the most common type of all found in Britain, this suggests that perhaps some were made here, although no kilns or waster dumps have been located. Simple platters like 26 and 31 are not confined to military sites, just the opposite; for the greatest number comes from the Sheepen site at Colchester, but their production on a large scale does seem to be somewhat isolated from the early TR and TN industry. They were manufactured only in TN when it had been traditional for all forms, with the exception of platters like 15 and 16, to be made in both TR and TN. Both platters occur on Continental sites but 26, in particular, is less common there than in Britain. It is possible that the market for TR had already collapsed before these later forms were mass-produced, so potters had to concentrate entirely on TN. Towards the end of TR production most of the forms with moulded walls were replaced by simpler forms and harder fabrics; these forms may have been the work of a new group of potters.

Variants of the concave-walled platter 31 have been identified on 34 sites, which are shown on Fig. 10. More than any other, it is the vessel form which extends the overall distribution of TR and TN to its present limits. In addition, it turns up consistently in the latest contexts for TN, some of which are reasonably secure from contamination by

survivals from previous phases of occupation. The most northerly and, presumably, the latest find of this sort is a platter found in the earliest levels at Corbridge (Gillam, 1956, No. 336). Several others have been found in Yorkshire, at Brough, Malton and York, and they appear to be associated with the military occupation of that region *c. A.D.* 71. It is possible, however, that these finds were brought by earlier military expeditions undertaken during the troubled reign of Queen Cartimandua which would suggest an earlier terminal date for their import.

SUMMARY

Two-thirds of 751 stamps found in Britain are name-stamps, the rest illiterate marks; most of these stamps are on TN, mainly on platters. There is some evidence for specialist die-cutters shared by some potters. The presence of stamps suggests that both TN and TR were imported in mixed consignments.

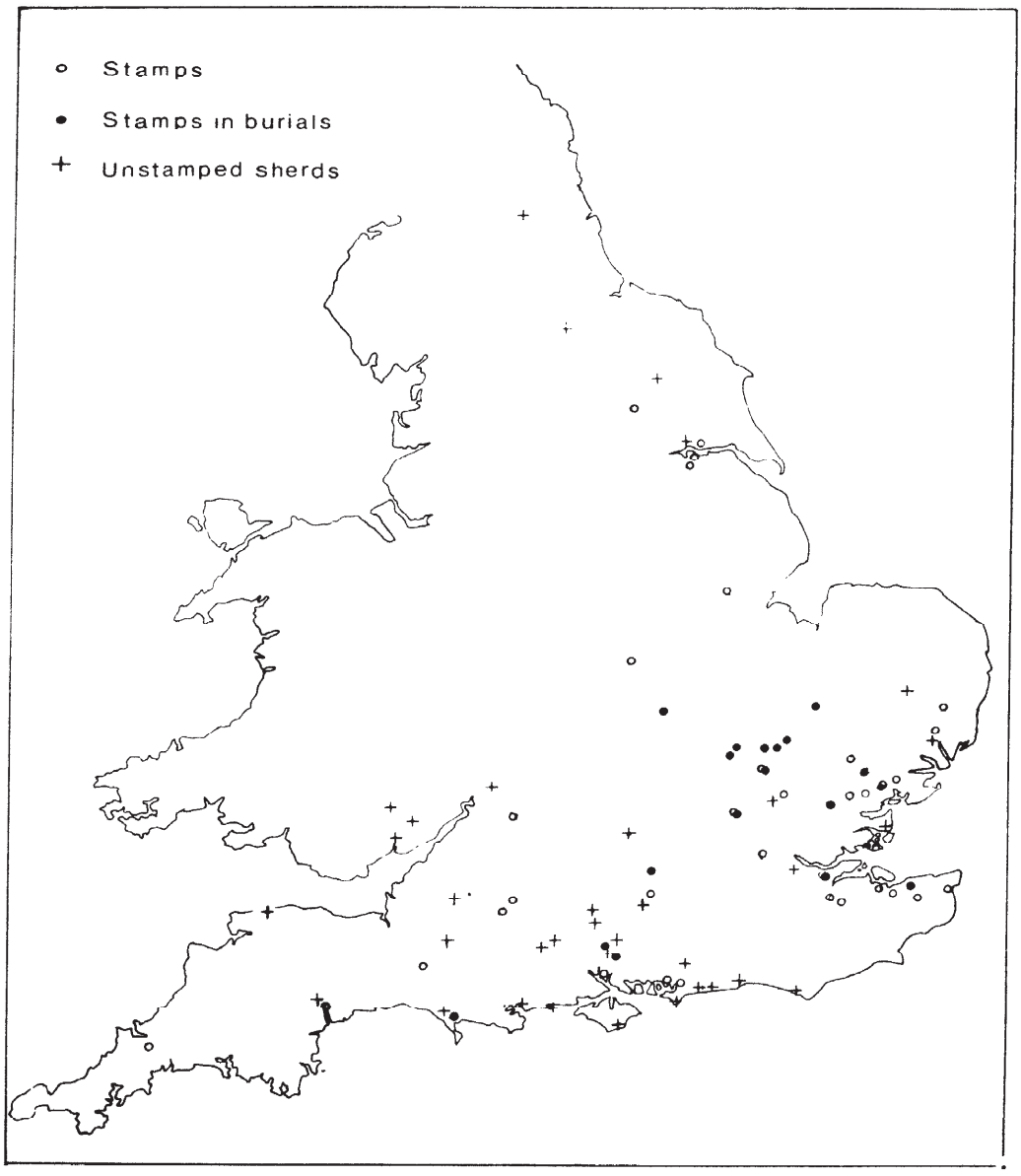


FIG.8. The Distribution of TR and TN in Britain. (Scale: 1 in.=60 m.)

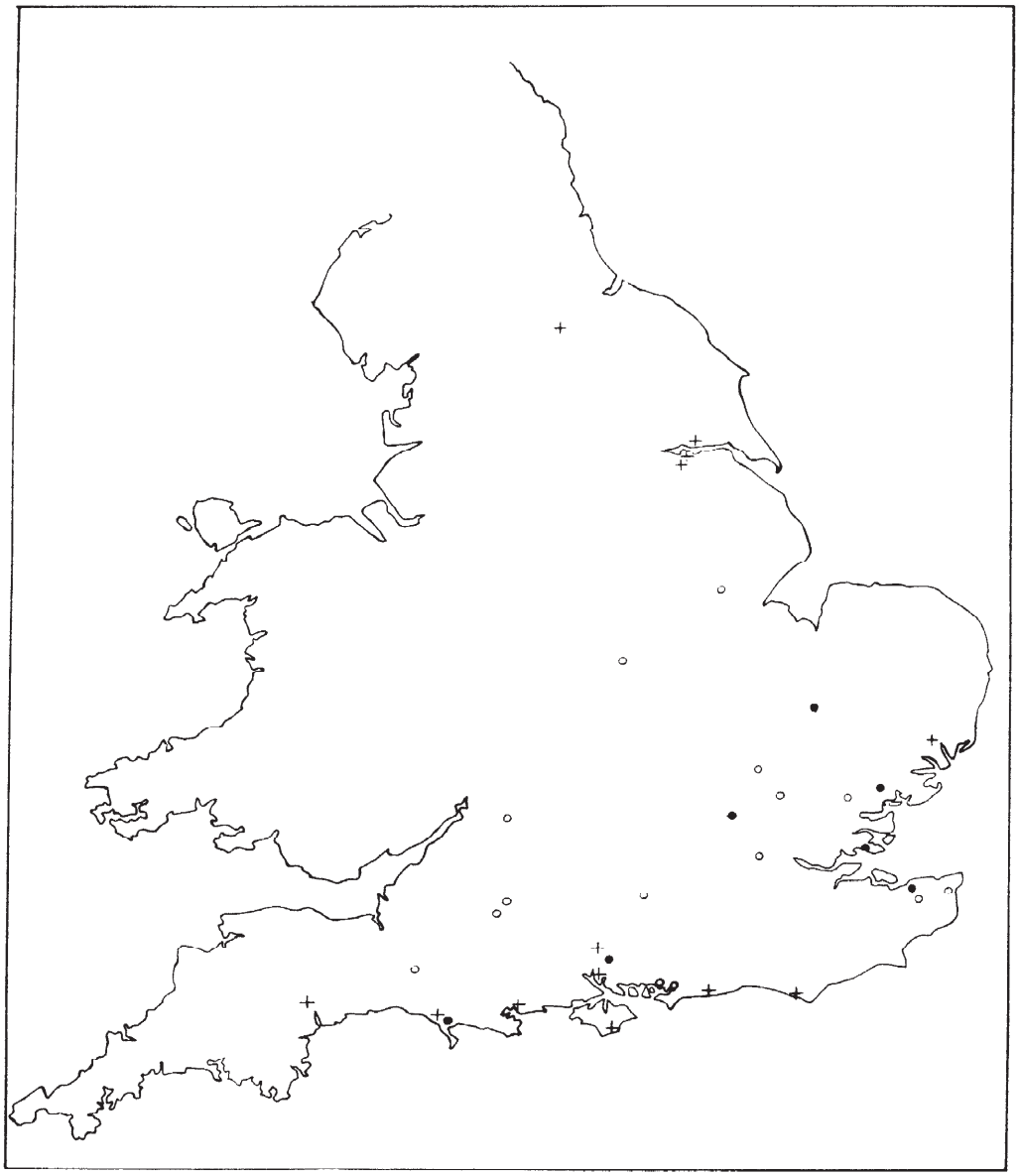


FIG. 9. The Distribution of TR in Britain. (Scale: 1 in.=60 m.)

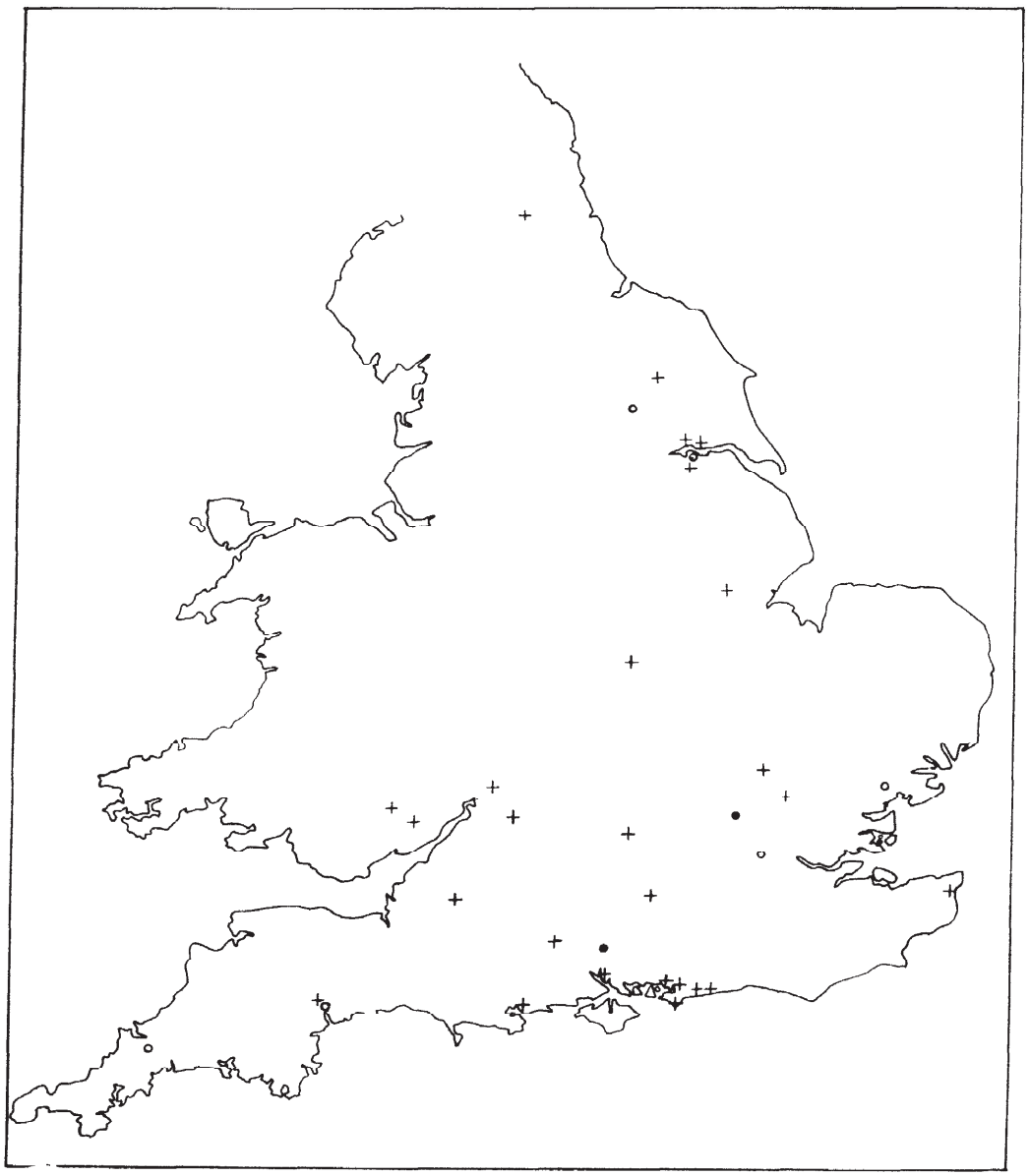


FIG. 10. The Distribution of TN Platters 31 and 32 in Britain. (Scale: 1 in.=60 m.)

THE POTTERY FROM USK

KEVIN GREENE

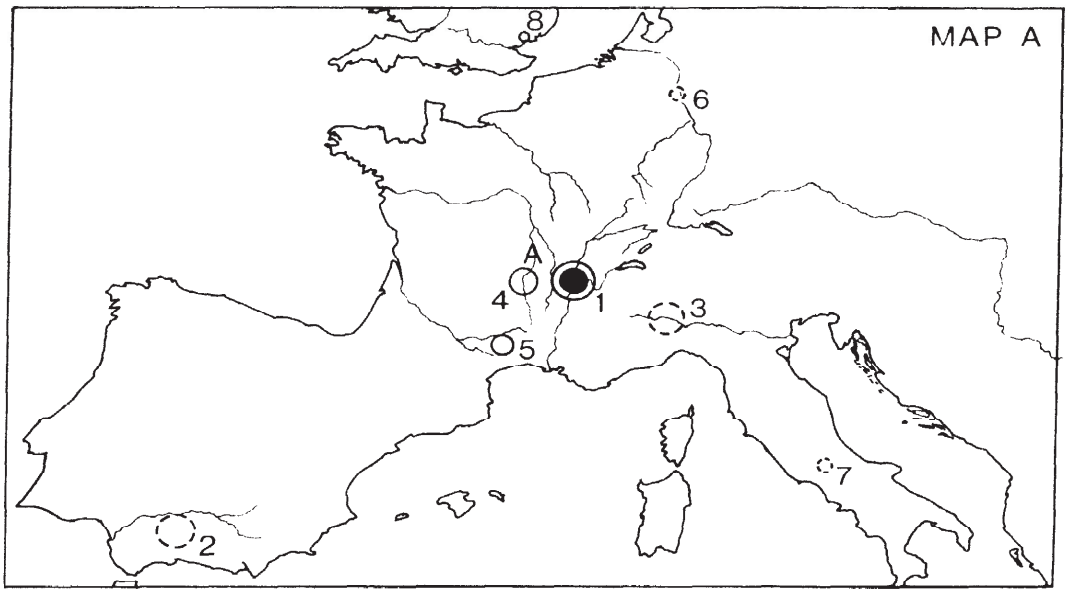
EXCAVATIONS have been carried out at Usk, Mon., in 1965 and 1967-72, by Dr. W. H. Manning, F.S.A., on behalf of the Dept. of the Environment and University College, Cardiff. Dr. Manning has contributed the following summary of the results of the excavations :

> 'Three Roman forts are now known at Usk, Monmouthshire, two of which are pre-Flavian, the third Flavian. The earliest is known only by one side, the eastern, where it has been traced by excavation for some 140 metres. Surface indications suggest, however, that it extends to the south beyond the excavated area for another 100 metres; how far it runs to the north is not known. A twin-towered gateway with dual roadways has been excavated on this side, but no internal buildings were found in the 1.5 hectares of its interior which have been cleared. This fort was probably constructed in the period A.D. 50-55 and may have held a garrison containing both auxiliary and legionary troops.
>
> 'It was replaced some years later by a large strongly defended fortress of legionary size (c. 21 hectares). Over two hectares have been excavated within the interior of this fortress to reveal works areas and two series of granaries. It was in turn replaced in the Flavian period by a fort lying in its north-western corner.'

The large scale of the excavations has naturally meant that a very large quantity of stratified pottery has been recovered. Detailed study of this has led into a wider consideration of pre-Flavian fine wares and their sources, not only at Usk, but in Britain as a whole. As these were mainly imported, this naturally led to the study of their Continental origins: it will also be seen that most of the coarse pottery also required study against a Continental background.

Before the coarse pottery is discussed, the question of the importation of fine wares into Britain from A.D. 43 to c. A.D. 70 will be discussed. Samian ware and the 'Gallo-Belgic' *terra nigra* and *terra rubra* are excluded from this study. They have special problems, and have already received considerable attention from past and present students. The wares studied here are principally 'colour-coated' (i.e. bearing a fine slip which normally contrasts with the colour of the clay body), and lead-glazed. I have published (Greene, 1972) a short descriptive account of these wares, with full illustrations of types occurring in Britain; this will be expanded in a volume of the Usk excavation report. It is their economic implications and the light that they throw on trade and supply to Britain in the decades immediately after the Conquest that will be discussed here.

The colour-coated wares came from seven sources, in Gaul, Lower Germany, Spain, and Italy; the lead-glazed ware came from various sites in the Allier valley, Central Gaul (see Map A), The characteristics of these wares (described more fully in Greene, 1972) are summarized below, in the order that they appear on Map A and in the table of their frequency.



MAP A

Sources of colour-coated and lead-glazed fine wares. The sizes of the symbols are related to the importance of their products for Britain. Where the production site or sites are unknown, broken circles are used. The numbering relates to the table on p 28.

1. Lyons.
2. Spain (province of Baetica).
3. North Italy.
4. Lezoux.
5. La Graufesenque/Montans.
6. Lower Rhineland.
7. South or Central Italy.
8. Colchester.

A. Allier region (glazed wares).

1. LYONS (FRANCE)

Fabric—cream, often green tinged, with a brown to near-black colour-coating. Forms—hemispherical cups, rough-cast or bearing applied decoration; beakers with rounded shoulder and everted rim, mostly rough-cast. (Greene, 1972, 1-2; Figs. 1-4. For a stratified group from Winchester, see Cunliffe, 1964, 59, Fig. 13, Nos. 7-10, 12-15, but not No. 11, which is Spanish.)

2. SPAIN

Fabric—buff or orange-buff, with an orange-brown, red-brown, or honey-coloured glossy colour-coating. Forms—a range of cups, small bowls, and cylindrical beakers. Many bear typical barbotine decoration of plants, leaves, etc. (Greene, 1972, 7-9; Fig. 8. For origin in province of Baetica see Comfort, 1939, supported by Vegas, 1969, 213-14. Three typical vessels have been published from a pre-Flavian pit at Richborough, Bushe-Fox, 1949, P1. xc, Nos. 409-11.)

3. NORTH ITALY

Fabric-red-brown with a grey-black colour-coating. Forms—cups of 'eggshell'

thickness. (Greene, 1972, 10-12, and Fig. 9, No. 1; Camulodunum form 64—Hawkes and Hull, 1947, PI. LIII).

4. LEZOUX (PUY-DE-DOME, FRANCE)

Fabric—buff with mica; chocolate brown to black colour-coating, not very lustrous. Forms—cups (a few bearing barbotine decoration) and beakers bearing rough-cast particles of clay, not sand. (Greene, 1972, 4-5; Fig. 7.)

5. SOUTH GAUL (LA GRAUFESENQUE AND/OR MONTANS?)

Fabric—buff or brown, with glossy red-brown or honey-coloured colour-coating. Forms—hemispherical cups bearing *moulded* decoration similar to contemporary samian designs. Certainly made at La Graufesenque samian workshop sites; probably also at others such as Montans. (Greene. 1972, 5-7; Fig. 7. Discussion by Ohlenroth in Ettlinger and Simonett, 1952, 42-51. Examples from Vindonissa are well illustrated, *ibid.,* Taf. 31.)

6. LOWER RHINELAND (NORTH OF MAINZ)

Fabrics—very variable, from several sources. Browns, buffs and white are common, with red-brown to near-black colour-coatings. Forms—hemispherical cups, many with barbotine decoration; beakers with rounded shoulders and everted rims, some bearing barbotine decoration. (Greene, 1972, 3-5; Figs. 5 and 6.)

7. SOUTH OR CENTRAL ITALY

Fabric—red-brown, with red-brown colour-coating. Forms (in Britain)—cups with two handles, bearing barbotine decoration or rouletting. (Greene, 1972, 10-12; Fig. 9, 6-8. For a relatively unimportant kiln site in the Rome area, see Duncan, 1964.)

8. COLCHESTER, ENGLAND

Fabric—buff with a poor red-brown or grey-brown colour-coating, rather matt. Forms—cups and beakers copying Lyons forms. Only important in Colchester itself.

LEAD-GLAZED WARE

Fabric—usually white, sometimes buff-grey with mica; surface—even glaze, various shades of green, sometimes yellow or brown. (Greene, 1972, 12-14; Figs. 10-12, where all forms encountered in Britain are illustrated.)

In the great variety of the origins of these wares lies their archaeological interest. Their relatively short span of time and their diversity make them sensitive trade indicators—for which the contemporary South Gaulish samian ware is too ubiquitous. They give insight into the distances from which quite small quantities of luxury vessels might be brought to Britain; furthermore, they reveal discrepancies between their actual and expected distributions and degrees of importation. The following table shows the frequency of colour-coated cups from the various sources found in Britain. This is related to the distance from Britain of their sources. Only *cups* are considered in the totals of vessels. There are two reasons for this. A combination of changing fashions and economic disruption led to the virtual disappearance of the hemispherical cup form around A.D. 70, which allows us to assign unstratified vessels to the pre-Flavian period on their form alone. Secondly, continued production of colour-coated *beakers* in

certain areas (Lezoux and the Lower Rhineland, for instance) with little change in fabric or form means that unassociated vessels are not closely dateable. It is therefore thought safer to use only cups. The table is based on 214 cups recorded up to September, 1972.

Source	Total	Order of Proximity
1. Lyons	176	3
2. Spain	17	6
3. N. Italy	7*	5
4. Lezoux	5	2
5. S. Gaul	4	4
6. L. Rhineland	3	1
7. S. or C. Italy	2	7

* Excluding two anomalous deposits from Colchester, see p. 30.

It is quite clear that the overwhelming majority of vessels came from Lyons. This is particularly interesting compared with the minute quantity of the ware imported from the Lower Rhineland, the nearest source.

The two wares were certainly contemporary, both being already present at the Valkenburg in period I *(c.* A.D. 40-41). They are of equal quality for their function, although the Lyons vessels (subjectively) have a better finish and appearance. The German ware is exceedingly common in its own area, making up 60-80 per cent. of most Lower Rhineland collections of such wares. It possessed the advantage of direct shipment from the Rhine to eastern Britain, compared with the routes available from Lyons, which inevitably involved long land, river, and sea journeys, using the Loire and perhaps the Seine. The former involved sailing around Brittany, and must have been hazardous for such fine pottery. The second most numerous ware, that from Spain, required a sea journey of at least seven times the length of that from the Rhine, yet there are only three cups from the latter source in Britain.

Some influential factor must be found to explain this disparity, and the outstanding success of the Lyons ware. The answer could well be that a contract was given to the Lyons industry which made its trading superiority in Britain almost impregnable. Recent discoveries in Lyons strongly support this idea; they are accessibly summarized by Lasfargues, 1972. Lyons became a Roman colony in 43 B.C., and was made the capital of Gaul by Augustus in 16-14 B.C. ; his residence there for long periods was continued by other members of the Imperial family, Claudius being born to Drusus there. As early as *c.* 30 B.C. a workshop at Loyasse, Lyons, was making *terra sigillata* of Italian types; this was succeeded by an industry at 'La Muette' on the bank of the Saône opposite the northern end of the hilltop centre of Roman Lyons. On this site ware almost identical to Arretine was made, as well as fine-ware beakers of the 'ACO' type, again almost identical to Italian vessels. Audin and Leglay, 1966, note the occurrence of many La Muette 'Arretine' stamps at Haltern, the Augustan fort on the river Lippe, Germany. Some of the much-debated ATEIVS 'provincial Arretine', long seen as being made in response to the demand from the frontier forts, was also made at La Muette. Vegas, 1969-70, 124, Abb. 24, shows with a distribution map of 'ACO' wares made in North Italy and Lyons that the latter workshop was orientated towards the military market of the Lower German and Upper Danube forts.

We have, then, clear indications of a tradition of pottery-making in Lyons for the military frontier market in the Augustan period. A recession seems to have occurred in

the Tiberian period, perhaps because the full expansionist aims of Augustus were not fulfilled. In the late thirties to early forties A.D. many new forts were built on the Rhine, and the upper Danube frontier line was advanced to the river itself (Ulbert, 1959, 83). The plans of Gaius (whether ineffectual or not) for further conquest in Germany and Britain also coincided with the sudden expansion of the Lyons colour-coated ware, Simple Tiberian vessels in the fabric described are found in Lyons and also at Vindonissa (Switzerland); then, the whole new decorated and rough-cast range appeared (without any immediate proto-types) to be found at Valkenburg in *c.* A.D. 40/41, and in a pre-Claudian context at Vindonissa (Lüdin, 1960-61, 24, Abb. 19, No. 5). These were made at La Butte, Lyons, a short distance from the La Muette site (Lasfargues, 1972, 17). Considering the coincidence of production of 'Arretine' and ACO-beakers at La Muette with the German campaigns of Augustus, it would seem very possible that the coincidence of La Butte's products and the fort building on the Rhine and Danube and the conquest of Britain might have resulted from a similar (officially inspired?) anticipation of a large new demand. The numerous inscriptions referring to *'negotiatores'* of pottery in Lyons are interesting in the light of such industries (Lasfargues, *op. cit.).* The Imperial connections of the city and its situation at the junction of many trade routes would probably also direct official attention to its industries as possible suppliers for the army.

The end of the industry seems to support this idea. It disappeared as rapidly as it appeared in *c.* A.D. 70, leaving no direct successor. After its products had reached 600 miles to York in the north (Wenham, 1971, 49) and 450 miles to the Magdalensberg (Austria) in the east, and after being found on almost every Claudian-Neronian site in Britain, Germany, and North Switzerland, the ware is then absent from the Flavian forts of Germany, and only present in small quantities on the sites of the seventies A.D. in Britain, where it probably survived as old stock in stores for a few years (e.g. Nash-Williams, 1932, 323, Fig. 62, No. 432, from Caerleon).

This rapid disappearance probably resulted from dependence on the military market; the troubles of A.D. 68-70 resulting from the death of Nero certainly affected Gaul, Upper and Lower Germany, Rhaetia, and Noricum (summarized by Webster, 1969, 65-9; for the upper Danube provinces, Ulbert, 1959, 86-7)—that is to say, the principal market area of the Lyons ware. The troubles must have caused a hiatus in supplies from Lyons. Furthermore, a change in fashions away from cups to beakers occurred at about the same time (note the disappearance of Form 24/25, and Ritterling 8 and 9 cups from the samian repertoire in the Neronian-Flavian period). The rather rare colour-coated drinking vessels of the Flavian period are always beakers. Thus, the hiatus in the markets and the change in fashions seem to have effectively destroyed this Lyons industry.

The military contracts suggested for the supply of the army in Britain with Lyons ware seem to have virtually excluded its competitors, who had the disadvantage of the cost of a sea transhipment to add to the selling price of their fine-ware vessels. Significantly, the Spanish, Lezoux, and South Gaulish cups come from areas that exported other kinds of pottery in quantities that seem to have made the occasional inclusion of other fine-ware vessels viable. The Spanish ware, as has been noted above, seems mostly to have been made in Baetica. The vessels found in Britain may have been included in the cargoes of globular oil-amphorae made and filled in the Guadalquivir valley, Baetica (Peacock, 1971, 171). There is a moderate amount of early 'micaceous Lezoux samian in Britain (Boon, 1967) and lead-glazed ware was made at Lezoux itself and the nearby Allier region. The few colour-coated vessels from Lezoux may have come to

Britain with either the relatively common glazed ware, or the 'micaceous' samian. As the South-Gaulish cups were made in the well-known samian factories, they could easily have been shipped with the samian—perhaps as 'make-weights' in incomplete cargoes.

The large numbers of black 'eggshell' cups in Britain present a problem. Two deposits—one reputed to have contained about 100 vessels (Hawkes and Hull, 1947, 229) and another containing a smaller number have been found at Colchester. These could well represent consignments which arrived broken. These vessels occur sporadically in the Rhineland, and presumably had some curiosity value because of their extreme thinness rather than their usefulness; that buried with the cremation of Favonius Facilis at Colchester has a hole in the wall, inadequately patched by the potter; that from Waddon Hill, Dorset (Webster, 1965, 141, Fig. 5, No. 3), has a very irregular upper wall. Whether the concentration of these Italian vessels at Camulodunum has any relevance to the question—still unresolved—of the dating and significance of the 'Arretine' from the site remains to be seen. Their dating is certainly post-Conquest. In addition, Colchester has produced the only two South or Central Italian vessels from Britain—again, perfectly good post-Conquest types (May, 1930, Pl. XXXI, No. 134a. erroneously called yellow-glazed. 134b is not illustrated by May—see Greene, 1972, 33, Fig. 9, No. 7).

The Lower Rhineland cups may have come to Britain by any casual trading, or in the possession of troops from that area. They have been found at Wroxeter and Colchester (unpublished) and Richborough (Bushe-Fox, 1949, PI. XC, No, 412). There may have been no incentive to export; the industries were mainly small with limited distributions even within their own area, and may only have had the capacity to supply the numerous forts and civil settlements in their own vicinities, where it has already been stated that they form about 60-80 per cent. of collections. The lack of vessels much south of Mainz is of interest. The only two vessels at Vindonissa, Switzerland, and two of the three from Britain are in the only ware that is found consistently throughout the lower Rhineland.

The success of the Lyons ware is also reflected by the lack of imitations in Britain; they are only found in any quantity at Colchester.

The factors governing fine-ware importation are not simple—supply contracts and the presence of other exports from their production areas both seem to have been influential in securing success in the British market. It is hoped that the problems that can be observed with these distinctive wares will be borne in mind in the cases of other trade items which cannot be so easily differentiated and assigned to specific sources.

Full distribution maps and catalogues of the material from which these observations have been drawn will be included in the volume of the Usk excavation report referred to above.

The Coarse Pottery

The two pre-Flavian structural phases disclosed by the excavations at Usk are particularly interesting, because they are reflected with remarkable clarity by the pottery. The contrasts between the two assemblages seem to represent two different solutions to the problem of supplying a large garrison with its everyday pottery requirements.

Phase 1

A selection of forms characteristic of this phase is illustrated on Fig. 1. The pottery

was almost certainly nearly all made very close to the site during this phase (no kiln evidence exists, but the natural subsoil from the excavation requires little preparation to become an excellent potting clay). The usual fabric of this phase is quite fine, with no added filler, and rarely any grog. It is fired to an (oxidized) orange or yellow-buff, or a (reduced) pale blue-grey. The small number of vessels which are not in this fabric usually also differ in form, and betray a different origin.

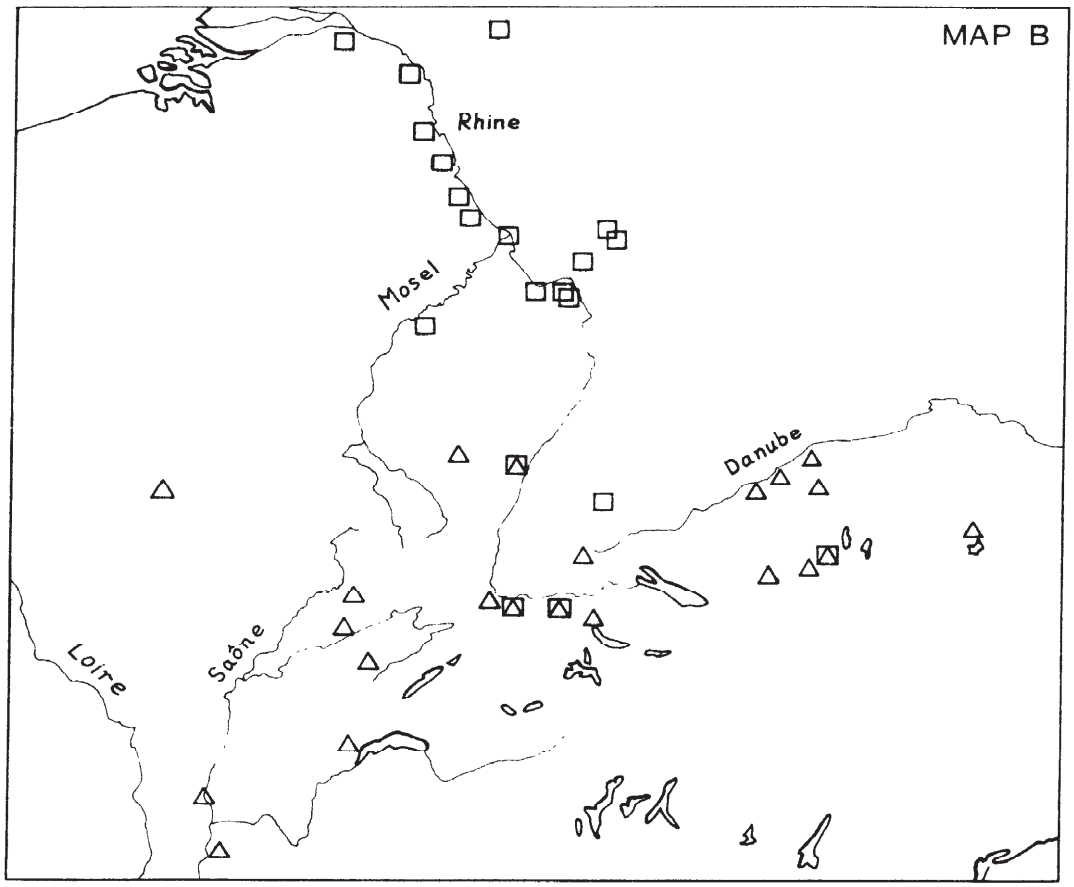
The range of forms found in the standard fabric is not closely comparable to those found on any other British sites when considered as a group. Even individually, parallels for some are not common. Furthermore, the forms do not owe anything to the mixture of native and Roman pottery traditions found soon after the Conquest in most areas of Britain.

As a group, the forms have more in common with assemblages in the Rhineland than in Britain, and their fabrics are also very similar. The reason is probably quite simple; Usk lay in hostile territory with virtually no pre-Roman Iron Age pottery traditions. There was, therefore, no possibility of relying upon local suppliers using their native techniques to produce traditional forms of vessels, with the addition of new requirements such as mortaria and flagons, as was done elsewhere. This kind of industry can be clearly seen in Dorset; the kilns at Corfe Mullen (Calkin, 1935), made native forms—(op. cit., 47, Fig. 9, 9-33) together with flagons and mortaria in whitish or buff fabrics *(ibid.,* Nos. l-8a). The market of such basically native industries included military sites—at Waddon Hill 'by far the greater proportion of pottery, as much as 80%, is black native ware in a limited range of types' (Webster, 1965, 6). Usk contrasts sharply with this in its first phase; 80-90 per cent. of the coarse pottery was probably made by military potters who had learnt their skills abroad.

A search for parallels abroad to attempt to localize the origins of the potters produced an unexpected result-that although most of the flagon, jar and bowl forms have close counterparts in the Rhineland (Map B, indicated by squares) two more unusual jars come from a different area. These are a shouldered jar (Fig. 1, No. 12) and another with cordons on the neck (Fig. 1, Nos. 13, 14; Map B, triangles). Although these do bear a superficial resemblance to some Romano-British forms of Belgic origin, their fabric and workmanship is identical to the other military products. Furthermore, their occurrence on Continental military sites makes this resemblance purely coincidental. Both forms are found in an area occupying the eastern half of the province of Rhaetia, and Upper Germany south of Strasbourg, with outliers in the south-eastern part of Gallia Lugdunensis. This is particularly noteworthy, because the pottery found on military sites east of Vindonissa (Switzerland) in this area differs considerably from that of the Rhineland area. Flagons of North Italian origin, bowls of Swiss La Tène origin, and various fine and coarse jars of Alpine La Tène III derivation are characteristic of sites such as Aislingen and Burghöfe (Ulbert, 1959); there are also a number of La Tène III painted vessels of local origin, similar to those published from the Roanne region of Gallia Lugdunensis (Cabotse and Perichon, 1966).

There is naturally an overlap area where the two ranges occur; at Vindonissa (an important 'crossroads' for Rhine and Danube influences) a moderate proportion of 'Rhineland' forms is found. In the Strasbourg area Rhineland forms dominate and the Alpine/North Italian pottery forms are mostly absent ; but the shouldered and cordoned jar forms are present. (The full details of all the sites and assemblages involved cannot be included in this short summary.)

Now, if the military potters came from a single area, and continued to make the forms of vessels current in their area of origin, it would seem appropriate to look to the



MAP B

Squares represent sites where fig. 1, nos. 1, 2, 8, 9 or 11 occur; *triangles,* sites where fig. 1, nos. 12, 13 or 14 occur. Sites where there are examples from each series are represented by a triangle within a square.

Upper Rhineland, where the required overlap of pottery forms occurs. In this area, Strasbourg was the legionary fortress of Legio II *Augusta* (which, of course, formed part of the invasion force for the conquest of Britain) from A.D. 17-43. Whether part of this legion could have been at Usk is a debateable point. I state the coincidence of the pottery distributions in the area containing the fortress at Strasbourg tentatively; publication of some large Tiberian-early Claudian pottery groups from the fortress site itself would be very interesting.

The first phase of the forts at Usk is also rich in fine wares apart from samian. There are plentiful colour-coated cups and beakers from Lyons and a few from Lezoux; three North Italian 'black eggshell' cups; moulded and wheel thrown Central Gaulish glazed ware; imported *terra nigra* and 'Pompeian red'; and a number of imported moulded-disc volute lamps.

Phase 2

The pottery from Phase 2 comes principally from a series of pits just inside the rampart of the large fortress. The pottery that they contain is very homogeneous, and unabraded sherds from several vessels are found in two or more different pits. It can, presumably, be considered as a large group contemporary with the initial occupation of the second phase fortress.

Except for a few small 'rubbish survivals', no vessels of the forms and fabrics typical of Phase 1 are found in these pits. Apart from some jars, reeded-rim bowls and ring-neck flagons of typical later first century 'Roman' forms, the pottery consists of vessels based on insular regional traditions, whose origins are reasonably clear.

1. *'Belgic' vessels* (Fig. 2, Nos. 15-17 'B'). These display the kinds of forms and fabrics that resulted from the 'Romanization' of the native pottery traditions of south-eastern England, and which spread (with the military market) to the North and West Midlands.

2. *'Severn Valley' vessels* (Fig, 2, Nos. 18-21 'SV'). These are in buff or pale orange fabrics which often have a pale blue-grey core, and a gently burnished surface. Bowls and jars with an S-profile are typical, also straight-sided tankards; most are closely parallelled by vessels from Kingsholm and the early levels of Gloucester (Green, 1943, 16 and 17, Figs. 1 and 2).

3. *'Durotrigian' vessels* (Fig. 2, Nos. 22-4 'D'). These are in coarse sandy brown-black fabrics, and many are hand-made. Their forms belong unequivocally to the Durotrigian area of Dorset and Somerset—jars with upright rims and lattice decoration; bead-rimmed jars; and bead-rimmed bowls (No. 22, Wainwright, 1968, 12, Fig. 19, No. 87; No. 23, *ibid.,* 129, Fig. 19, No. 87).

4. *'Native'* vessels (Fig. 2, Nos. 25-7 'N'). These have a thick coarse fabric containing much grog, and are hand-made. The rims bear horizontal burnishing, and the bodies vertical less consistent burnished strokes. The commonest profile (No. 25) is relatively local, occurring at Caerleon, Abergavenny, and Gloucester, with Iron Age examples at Sudbrook Camp (Nash-Williams, 1939, 62, Fig. 5, Nos. 6-8). Their acceptability to military purchasers is perhaps surprising.

Also noteworthy in these pits is a large quantity of *terra nigra* with a grey fabric and more or less highly burnished surface (Fig. 2, Nos. 28-9 'TN'). The vessels represented are not platters, but large bowls and jars. The carinated bowls are particularly common. Miss Valery Rigby has examined this group of vessels and thinks that they are probably not imported and may well have been made in western Britain. None of them have the hard white fabric of some of the Phase 1 *terra nigra.*

Of the above-mentioned categories, a few vessels in the 'Severn Valley' and 'Native' fabrics are present in Phase 1 contexts; so also are some of the carinated *terra nigra* bowls. But their frequency is negligible in comparison with the Continental-derived pottery forms that typify that phase.

Conclusions

The two phases at Usk seem to represent two completely different methods of supplying a fort with its everyday pottery requirements. In the first phase, samian, fine wares, and some specialized vessels (amphorae, some of the mortaria) were brought to the site, but the vast majority of the pottery was made locally (in all probability very close to the fort, although kiln evidence is lacking) by military potters trained abroad. This would have reduced the burden on supply systems through hostile territory, but

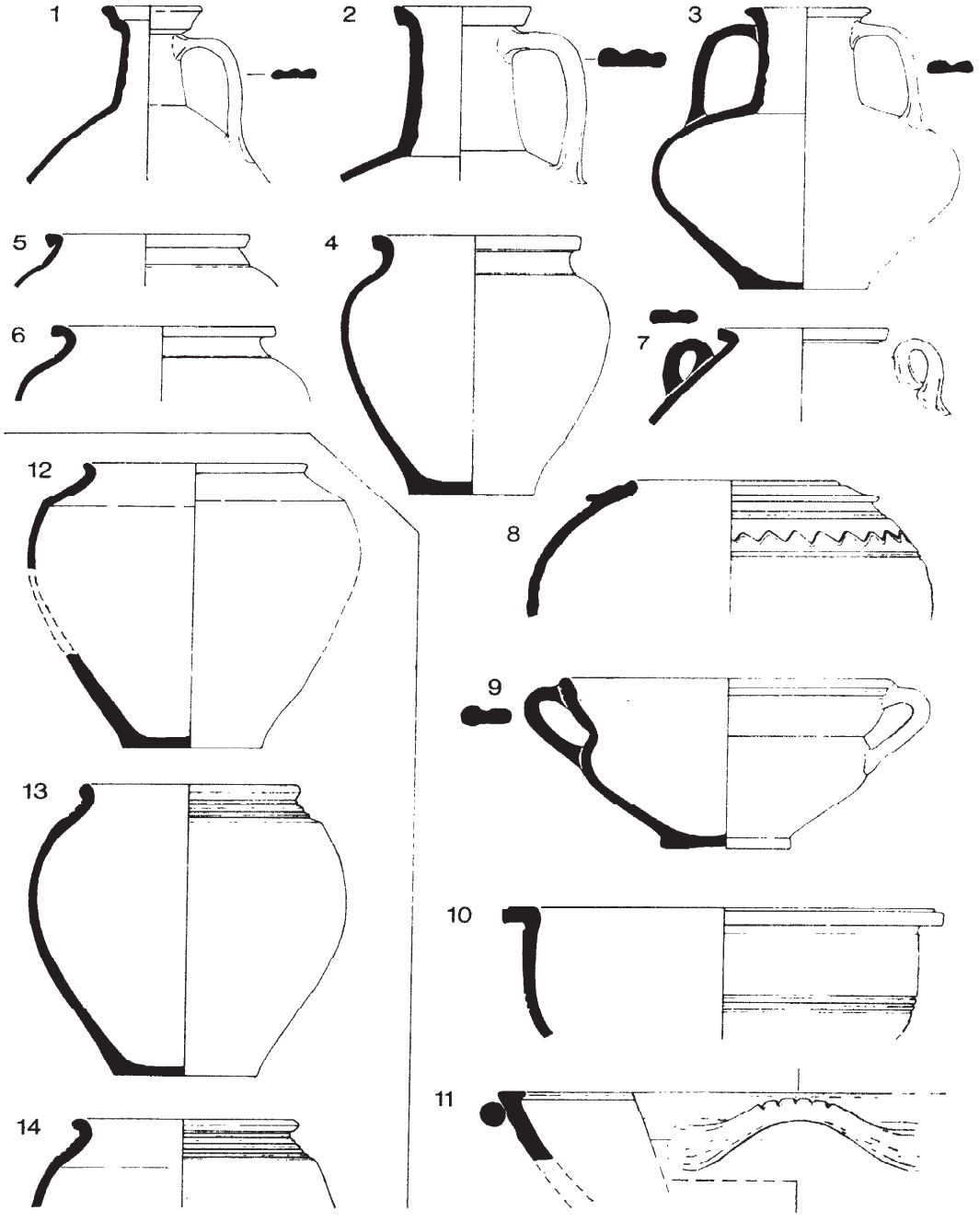


Fig .1 USK Phase 1 1:4

would have required valuable manpower for potting, kiln-construction, clay-digging and fuel-collecting. The rarity of sites *not* relying largely on local basically native-produced pottery in the pre-Flavian period demonstrates the reluctance to use military potters unless absolutely necessary. It may be a reflection of more settled conditions that the occupants of the second fort used pottery from 'Romanized' native industries bought some distance away. In the second phase, there is a lack of fine imported wares; this is not a chronological factor (they are also very rare at the Lunt, Baginton) as some of the types found in the first phase at Usk were still available in the mid-seventies A.D., and are found at Caerleon.

Finally, it is of interest to note the ancestry of some of the Rhineland forms of the first phase. Fig. 1, Nos. 8, 9, 10 and 11, can be traced back to Mediterranean origins. 8 and 11 were already in existence at least before *c.* 75 B.C. being present at Numantia, Spain (Koenen, 1929, Taf 63). 9 appeared in late Republican-early Imperial times as a fine ware cup or bowl, and continued into the late Augustan period in North Italy, where moulded 'SURUS' bowls of the same profile were made; these were exported to the Rhine and Danube frontiers (see Ulbert, 1965, Taf. 12, Nos. 6 and 7). Coarse copies appear at Haltern (Augustan, Loeschcke, 1909, Taf. XII, No. 55); Mainz (Augustan-early Tiberian—Baatz, 1962, Taf. 4, 1 and Taf. 6, 18—Mainz being incidentally the fortress of Legio II *Augusta* from A.D. 10-17 before its posting to Strasbourg; and Hofheim (Claudian-Neronian, Ritterling, 1913, Taf. XXXV, No. 69). Perhaps the most remarkable thing about these forms is how little they changed; 8 and 11 continued into the Flavian period at least, in Britain. 9 does not appear in Britain outside Usk (where it is *very* common) except for one vessel in white ware at Wall, Staffs. (Gould, 1966-7, 28, Fig. 12, No. 33.)

SUMMARY

The excavation of two pre-Flavian forts at Usk, Mon., has produced large quantities of well-dated pottery, including a variety of fine colour-coated and glazed wares. Examination of comparable wares in Britain and abroad revealed that colour-coated ware was imported into Britain from Lyons, Lezoux, and La Graufesenque or Montans in France; from the Lower Rhineland; southern Spain; and North and South or Central Italy. Glazed ware came from the Allier region of Central France.

The coarse pottery from the first two forts at Usk was of two types—in phase one, local(?) military products of Continental forms; in phase two, various wares bought from a number of sources in Britain.

FIG. 1.
Lower Rhineland forms.

*1. Flagon with projecting rim with concave face and internal ledge. Orange-buff.
*2. Flagon with simple square-cut rim. Pale orange.
3. Two handled flagon with plain flattened rim. Yellow buff.
4. Jar with standard Phase 1 body form, and simple squared rim. Blue-grey.
5. Jar with undercut rim. Orange.
6. Jar with projecting square-cut rim. Green-brown.
7. 'Honey-pot' with squared rim and two handles. Pale orange.
*8. Large jar with inturned rim designed to take a lid. Pale orange-buff.
*9. Two-handled bowl with constricted wall. Orange-buff.
10. Bowl with horizontal rim and smoothly curved wall. The rim is characteristic of Usk Phase 1 bowls; instead of being 'reeded', it has a small ledge at the outer edge. Blue-grey.
*11. Bowl with distinctive handle, with circular cross section. The rim is flat with a bead around its inner edge. Orange.

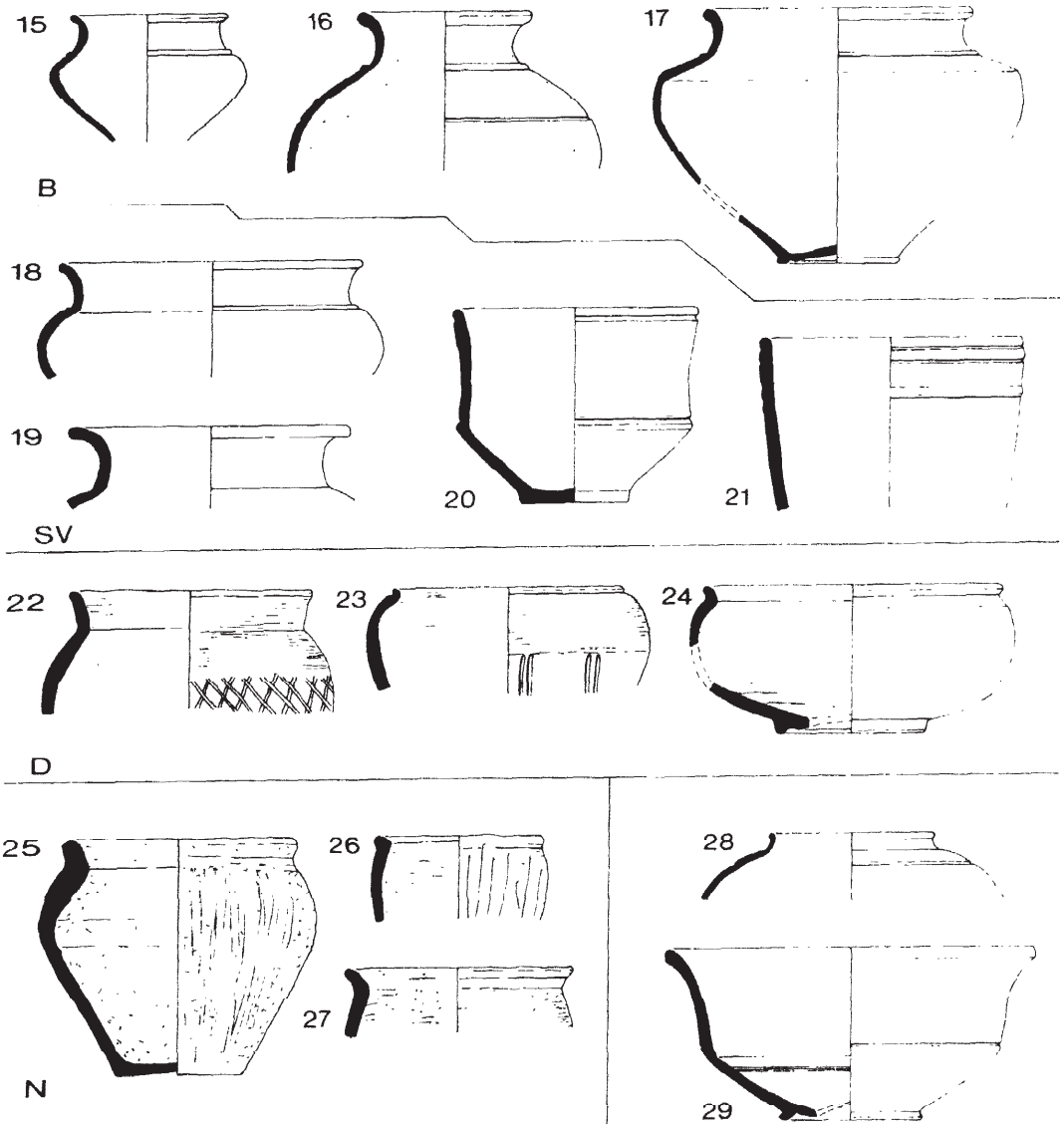


Fig.2 USK Phase 2 1:4

East France—Switzerland—Upper Danube forms.

* 12. Jar with distinct shoulder, Sloping smoothly to a small bead-rim. The wall curves outwards below the shoulder before returning gently to the base. Green-grey.

* 13. Jar with rounded rim and a series of cordons on the neck. The body profile resembles nos. 4 and 12. Pale blue-grey.

* 14. As 13, but with more everted rim, and even more cordons on neck. Blue-grey.

The numbers bearing asterisks are the forms used in compiling Map B. 1, 2, 8, 9 and 11 are represented by squares: 12, 13 and 14 are indicated by triangles.

FIG. 2.

B—'Belgic' derived forms.

15. Small jar with sharply curving wall and upright gently concave neck, with small projecting rim. Cordon at base of neck. Grey sandy fabric, burnished externally.

16. Tall jar with narrow concave neck and rim. Cordon at base of neck, groove on wall. Slightly vesicular grey-buff fabric.

17. Shouldered jar with upright concave neck and rim. Cordon at base of neck. Base slightly domed, with a small foot-ring. Grey-black sandy fabric, burnished externally.

SV—'Severn Valley' vessels.

18. Bowl with S-shaped profile. Cordon at junction of neck and shoulder. Orange surface; pale grey core.

19. Large jar with narrow concave neck and projecting rim. Orange-buff surface, pale grey core.

20. Carinated vessel with straight vertical upper wall. Orange-buff.

21. Straight-sided tankard. Other examples bear a simple handle. Pale orange.

D—'Durotrigian' forms.

22. Jar with gently everted upright rim. Shoulder, and interior and exterior of rim burnished; lattice decoration on body. Hand-made sandy-black fabric.

23. Bead-rimmed jar. Pairs of vertical burnished lines on body below burnished shoulder. Handmade black sandy fabric, brown on surface.

24. 'Durotrigian bowl' with small beaded rim. Low foot-ring. Wheel-thrown dark grey sandy fabric.

N—'Native' forms.

25. Jar with thick rounded rim. Interior and exterior of rim burnished in rough horizontal strokes. Body vertically burnished. Hand-made coarse brown fabric containing much grey and orange grog (crushed Roman pottery?).

26. Jar with straight sides and thick bead-rim. Irregular vertical burnished lines on wall. Hand-made; coarse sandy-brown fabric.

27. Jar with pointed everted rim. Some burnishing on exterior. Hand-made grey-brown fabric containing grey and orange grog.

TN—Terra nigra.

28. Large jar with small upright rim curving up from high flattish shoulder. Wide groove on this shoulder surface. Fine grey fabric; highly burnished black surface (externally).

29. Carinated bowl with gently everted rim. Small foot-ring and indications of a high domed base. Fine grey fabric, highly burnished black surface on interior and exterior.

THE MARKETING AND DISTRIBUTION OF MORTARIA

K.F. HARTLEY

CONTEMPORARY literature is almost silent about Roman pottery, and knowledge of its manufacture, distribution, and marketing has to be drawn from the pottery itself, the sites where it has been found, and the kilns where it was made. Pottery stamped by its makers, and stamped mortaria, in particular, has an advantage over unstamped coarse wares, since it is possible to trace the distribution of an individual potter's work; there is, therefore, a better chance of close dating because the dating evidence for one stamp is transferable to others from the same die. Furthermore, once several potters have been assigned to a given workshop, then the markets available to that workshop at different periods may be assessed with some assurance. For mortaria especially, it is possible to deduce the relative economic importance of different potteries, the development or shrinkage of markets and the way in which one pottery takes over trade previously enjoyed by another. This insight into the economics of the day is one of the most rewarding results that the study of mortaria provides. Another is the opportunity given by potters' stamps for the recognition of potters who migrated during their working lives.

It is a commonplace that, despite relatively primitive transport facilities, mortaria and much more delicate wares too often travelled very long distances in the Roman period. When possible water transport must have been preferred, partly because larger amounts could be carried by ship or boat, partly because the rate of breakage would probably be lower than for land transport, but decisively because water transport was much cheaper (Jones, 1964, 841-4). Nevertheless, in the Roman period, there was for the first time in northern Europe an excellent system of roads available for use when pottery had to be carried overland. Both methods of distribution may be demonstrated for Roman Britain : for the former, the transport of Colchester mortaria to the north in the Antonine period (Fig. 7) may be instanced, while the distribution of mortaria from Hartshill and Mancetter offers clear evidence of the use basically of road transport (Fig. 1).

Mortaria were introduced to Britain by the Romans—initially perhaps to supply essential equipment for army messes. With adoption of Roman ways and cuisine their use soon became a necessity over much of the province. Both army and civilian potters must have been manufacturing them in Britain soon after A.D. 43. There are isolated examples of mortaria imported into Britain after A.D. 100, but the import trade declined sharply after about A.D. 65, when the potteries between Verulamium and London, after working on a small scale for some years, burgeoned into importance, selling to markets limited geographically only by the boundaries of the province, though not, of course, with uniform distribution over the whole area. There is good evidence for kilns in this complex at Brockley Hill, Radlett and Verulamium.

It is, however, interesting and useful to trace the origins of the mortaria imported to Britain in the first century. Types which were habitually stamped can be readily traced and Fig. 2 shows the distribution of stamps from Italian brickyards, dated

primarily to A.D. 50-150. Many of these brickyards were in Campania: they made bricks, tiles, mortaria, dolia and even clay baths and sarcophagi, and the stamps of the same potters are found on all these products. Often the yards were owned by senatorials, though, as was usual with commercial activity, they were directed by freedmen who often controlled large staffs of slaves. Some of the tile-stamps record the names of the owner, the name of his manager and that of the maker of the tile, and at some periods a consular date is even given. A few of the mortaria from the Italian factories reached Britain, possibly by trade via the Rhine, but perhaps casually, though the chief market outside Italy was certainly the south of Gaul. Nevertheless, the outliers show how far mortaria could be transported.

Potters who worked in Gaul were obviously in a better position for trade with Britain, and one group taking advantage of the new market was the Atisii. They were three potters, G. Atisius Sabinus, G. Atisius Gratus and L. Atisius Secundus, whose activities probably all extended well into the Flavian period. Clearly, they were either related to each other or were freedmen of related *patroni,* and they worked together to judge by the similarity of their stamps. The mortaria of L. Atisius Secundus can always be distinguished from those of the others, because of the different *praenomen,* but those of the other two can only be distinguished if the *cognomen* has survived, since they often used the same die as each other to stamp G. ATISIVS.

The mortaria of Secundus are few in number and his market was restricted, possibly as the result of a short career (Fig. 3). The distribution of his work suggests the location of the kilns, probably near the boundary between Gallia Lugdunensis and Gallia Narbonensis, where considerable local demand was provided by the *coloniae* and other towns at Lyon, Vienne, Aosta and *Boutae.*[1] Gratus and Sabinus, however, had impressive markets outside this area, most notably in the Rhineland, but there are seven of their stamps in Britain, as well as one trawled from the English Channel. The distribution in the Rhineland strongly suggests dispersal along the river, and it seems probable that the mortaria reached Britain from the Rhine. These potters have a particular interest, as their two distinctive rim-profiles are mirrored closely in the work of Q. Valerius Se— (p. 41).

Further north, the potters of Gallia Belgica were well placed for trade with Britain, especially from the estuary of the Meuse. The potters in Group 1 (Fig. 4) worked at Amay, Bavai, and probably elsewhere nearby. Only the stamps of those potters whose work also appears in Britain are shown on Fig. 4, but the strong local concentration in Gallia Belgica and Lower Germany is evident. Since there are about 120 stamps of these potters known on the Continent, but only ten in Britain, the trade was obviously a relatively minor one. The small volume of trade seems curious at first sight, but the range of the potters involved was wide in date and some were certainly working in the second century, when import to Britain was unusual. The contrast in distribution with potters in Groups 2 and 3 is sharp. Of these, Group 2 produced mortaria of distinctive profile (Gillam 238) from about A.D. 70-100; Group 3 used fabrics identical with Group 2, but their rims and spouts were quite different (Dunnett, 1967, Fig. 8). Their work is datable to A.D. 55-85.

Stamps of Groups 2 and 3 are common in Britain, but rare on the Continent (Group 2—148 and 14; Group 3—63 and 7 respectively). No kilns have been found for any potters in the two Groups, but the strongly marked contrast with the distribution

[1] A. Allmer and P. Dissard, *Trion: Antiquités découvertes en 1885, 1886 et antérieurement.* Lyon, 1888, 318-19: they attribute Sabinus to Lyon but the evidence is quite inconclusive and seems more likely to refer to a pottery store which had been burnt out. Their kilns are more likely to be at or near Aosta.

for Group 1 makes it unlikely that they worked in Gallia Belgica. The relatively heavy distribution farther south, especially in Normandy, might be held to favour manufacture there, though either, or both, Groups could have worked in south-east Britain, where similar clay was to hand. Each Group produced its own characteristic forms, so that, despite the visual similarities in their fabrics, their kilns were evidently sufficiently widely separated to prevent mutual influence.

The leading potter in Group 2, Q. Valerius Veranius, had a complex career: he undoubtedly began work in Gallia Belgica, probably at Bavai, where eight of his stamps (not shown on Fig. 4) from three otherwise unknown dies have been found on mortaria in the local brown fabric. The mortaria are similar in form to ones made by Privatus of Group 1, whose work is common at Bavai. Veranius's other mortaria in Gaul conform to the standards of Group 2, and they suggest that he migrated from Bavai to establish the successful potteries of Group 2. The number of his stamps in Britain is 80, and the Group as a whole had a trade comparable in volume to the potteries of the Verulamium area.

In Group 3 the leading potter was Q. Valerius Se— (the *cognomen* presumably being Secundus or Severus). He is exceptional in using two basically different forms of rim, identical with the ones habitually made by the Atisii. Judging from this, one might expect Group 3 at least to be based in Gaul, perhaps in Normandy, but such a judgement would be premature for both Groups 2 and 3. Thus, all three Groups present problems which can only finally be solved by the discovery of kilns for the more important potters in Groups 2 and 3.

The only other stamped mortaria of importance exported to Britain were those of a second Verecundus, probably working in the second half of the second century, whose kilns have been found at Soller, Kreis Düren, in Lower Germany.[2] Nine of his stamps and many unstamped fragments from his distinctive mortaria are known from Britain, but on the Continent his stamps are recorded only from the kilns and (a single example) at Cologne. His mortaria are quite extraordinarily large (about 75 cm.) and may have had a specialized purpose, perhaps in bakeries. Moreover, Verecundus was selling to Britain at a time when importation of coarse ware from the Continent was exceptional, although Rhenish ware offers a parallel. A context for his activity may be provided by the well-known inscription from Domburg (probably of the late second or early third century) of a pottery merchant dealing with Britain (ILS. 4751).

In Britain, as has been observed, mortaria had been manufactured from the Claudian period onwards and, if the potters in Group 2 had their potteries here, then Britain was virtually self-sufficient in mortarium production by A.D. 70; she was undoubtedly so after A.D. 100. All the potteries and single kilns so far known to have made mortaria in Britain are shown on Fig. 5. Many other groups of kilns certainly remain to be found, but the general pattern is clear and all the major potteries for mortaria are either known or their general location can be deduced from the type of fabric used. As with other kilns, they are largely concentrated in the Lowland Zone, where the best potting clays are present in quantity. The inevitability of trade from south to north follows automatically, especially as the highland, military zone never had enough kilns to supply the needs of the army even if it had been policy to do so. In this context, the possibility that military contracts played a part in the trade should be considered. That it was possible for the authorities to issue contracts to manufacturers for supplies to the army is evident from Berlin Papyrus 1,564 (Lewis and Rheinhold, 1955, 515; an authori-

[2] Publication forthcoming. Information concerning the kilns and the stamp at Cologne has been supplied through the kindness of Frau Dr. Dorothea Haupt, of the Rheinisches Landesmuseum, Bonn.

zation and advance payment made by the Praefect of Egypt to the weavers of the village of Philadelphia for provision of one belted tunic, four Syrian cloaks and one blanket to the armies in Cappadocia), and is implied by ILS. 4751. One might *a priori* expect the army to buy in bulk direct from manufacturers, but the quantities involved in the Berlin Papyrus are pitifully small and it is evident that since contracts were used for such small-scale supplies, they would all the more have been essential for bulk supply. However, it seems at least as likely that the army authorities would deal with *negotiatores* as direct with potters or the owners of potteries.

Almost all the first-century mortaria in the north of Britain are non-local, and the bulk came from the potteries south of Verulamium. with a fair proportion supplied by potters like Q. Valerius Veranius (Group 2, Fig. 4, where only stamped fragments are recorded). From the second century onwards local sources of mortaria are more prominent but the potteries at Mancetter and Hartshill in Warwickshire took the lion's share of the trade (Fig. 6) until about A.D. 370. In the second century these potteries took over the greater part of the market previously served by the potteries to the south of Verulamium. They, of course, had an excellent home market in the midlands, thinning out as far south as Cirencester and Verulamium. South of this line their mortaria are distinctly rare. They occur also in Wales but very rarely in East Anglia and their market was again thin in the lower Nene Valley where the local potteries held sway.

Just as the Verulamium region potteries (including Radlett and Brockley Hill) and the potters of Group 2 were the giants of the Flavian period, the Mancetter-Hartshill potteries were one of the two giants spanning the period from the second to the fourth century. The second main source lay in the Thames Valley in the vicinity of Oxford. There the potteries again began in the early second century but on a smaller scale than the Warwickshire ones; they developed and went on in strength to the end of the Roman occupation supplying their largest markets in the southern half of the Midlands and the south of England (Fig. 6). They showed particular vigour in taking over markets from local potters in the west Midlands, Wales, Essex and the Verulamium region. North of the Mancetter-Hartshill potteries, they could make very little impact because of the saturation of the market, but their mortaria are found in small numbers both in the north Midlands and north, appearing even at Traprain Law in Scotland.

The potteries in the lower Nene Valley, so important for the production of colour-coated ware, also made mortaria, and these appear to have been the only two of their products marketed outside the immediate area. Presumably, they were sent away alongside the colour-coated ware and thus reached wide markets, but the numbers so exported are in fact very small. The New Forest potteries had only a relatively local market and neither these potteries nor the Nene Valley ones can compare in importance with those near Oxford and those at Mancetter and Hartshill. Another pottery, perhaps of less import than that in the lower Nene Valley but comparable in selling relatively small quantities of mortaria very widely, was active mainly in the late second and third century. It is as yet unlocated but probably in the Surrey-Sussex area where its mortaria are particularly common (Gillam 272).

Apart from potteries with really wide markets there were of course many smaller ones. These were conspicuously common in the second half of the second century, some of them partly concerned with supplying the military in the north. The Antonine potters of Colchester (Fig. 7) are an instructive example of this, since their market consisted of a south-eastern 'home' one and then one predominantly concentrated on the Antonine Wall and the Corbridge area, Incidentally, the contrast between the Antonine Wall and Newstead is instructive and lends added weight to the general

inference from distribution, that coastal shipping to the Tyne and Forth was involved. Similarly, Crico of Lincoln may well have been using water transport. Other groups of potters supplying the north-west particularly, were located at Wilderspool on the Mersey and in the Carlisle area. There was undoubtedly a number of potters working in the north-east probably at Corbridge, where Saturninus II functioned. Potteries at Brampton in Norfolk also supplied mortaria in small numbers to north-eastern England ranging from Corbridge in the north to Lincoln, but predominantly to east Yorkshire. It is impossible here to deal with all the lesser potteries: Fig. 8 gives a general indication of the activity of some during the Roman period.

SUMMARY

Stamped mortaria are of especial interest in permitting the work of their potters to be traced with ease; with them it becomes possible to study the markets of different potteries and their varying fortunes throughout the earlier Roman period. Stamped mortaria imported to Britain mostly in the first century are known to have been made in Italy, on the borders of Gallia Lugdunensis and Gallia Narbonensis, in Gallia Belgica and perhaps the north-eastern sector of Gallia Lugdunensis. British manufacture began early and by A.D. 100 at the latest Britain was self-sufficient for their production. Markets and potters in Britain present a varied picture ranging from individual potters serving a very local market to large industrial concerns. The latter can often be shown to have produced for markets over a substantial part of the province, trade with military sites often being prominent.

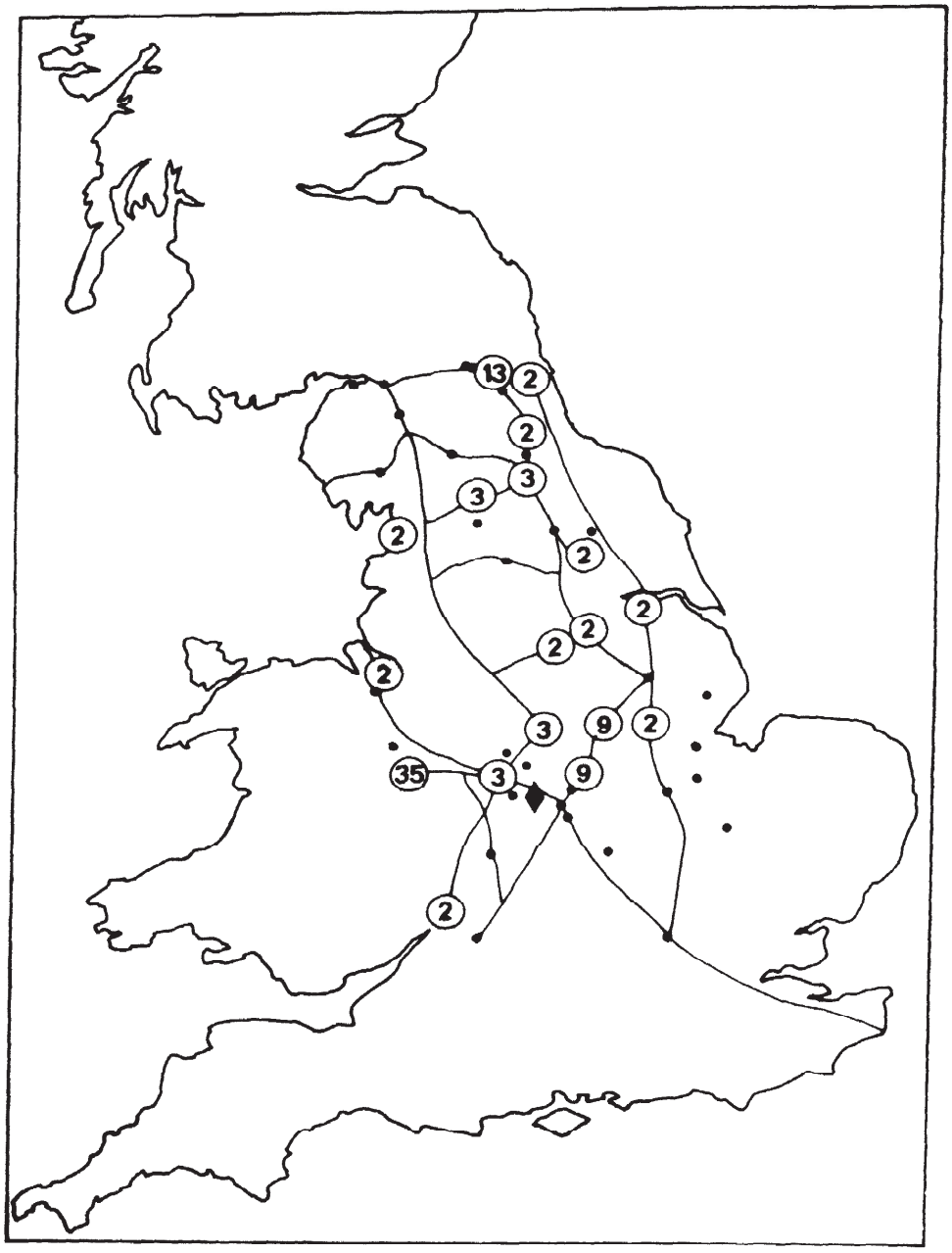


FIG. 1 The Distribution of stamped Mortaria of Carita—, Junius, Maurus, Mar— and Sennius. Potters working at Mancetter within the Period A.D. 160-190.

FIG. 2. The Distribution of Potters' Stamps from Italian Brickyards on all Classes of Products except Bricks and Tiles.

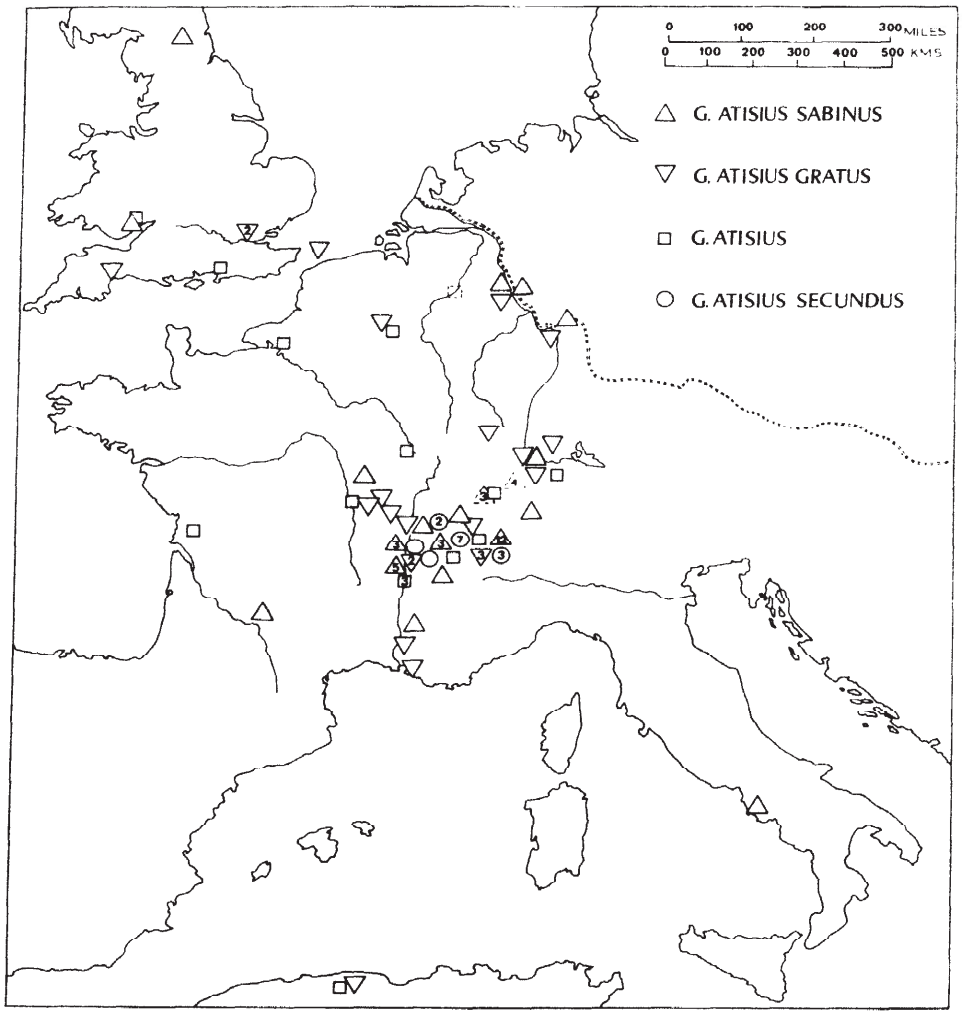


FIG.3. Stamped Mortaria of the Atisii.
(The Δ on the east bank of the Rhine at Neuss should be a □.)

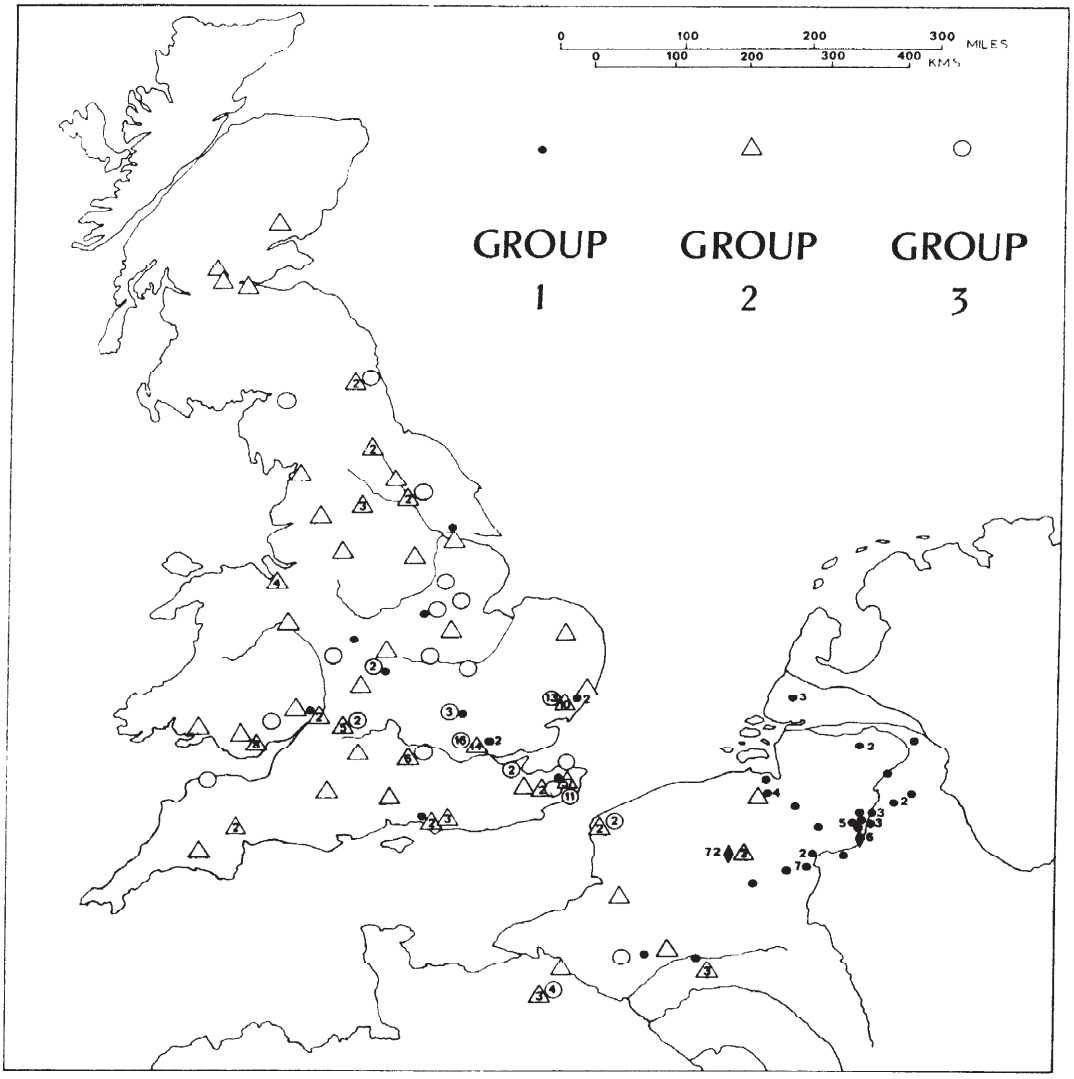


FIG. 4. Distribution of stamped Mortaria of: Group 1 (p. 40), including only those whose work appears in Britain: Adiutor, Martialis I, Privatus, Uxpuro, Vacasatus, Verecundus I and Virilis; Group 2 (p. 41): the Q. Valerius Veranius, Esunertus and Suriacus, Assar—, Boriedo, Cacumattus-Vassonus, Gracilis, T. Julius Afer. C. Julius Pri—, Litugenus I and Lossa; Group 3 : Q.Valerius Se—, Buccus, Fronto, Mottius Bollus, Orbissa, Orgil—, Paullus, Prasso and Summacus.

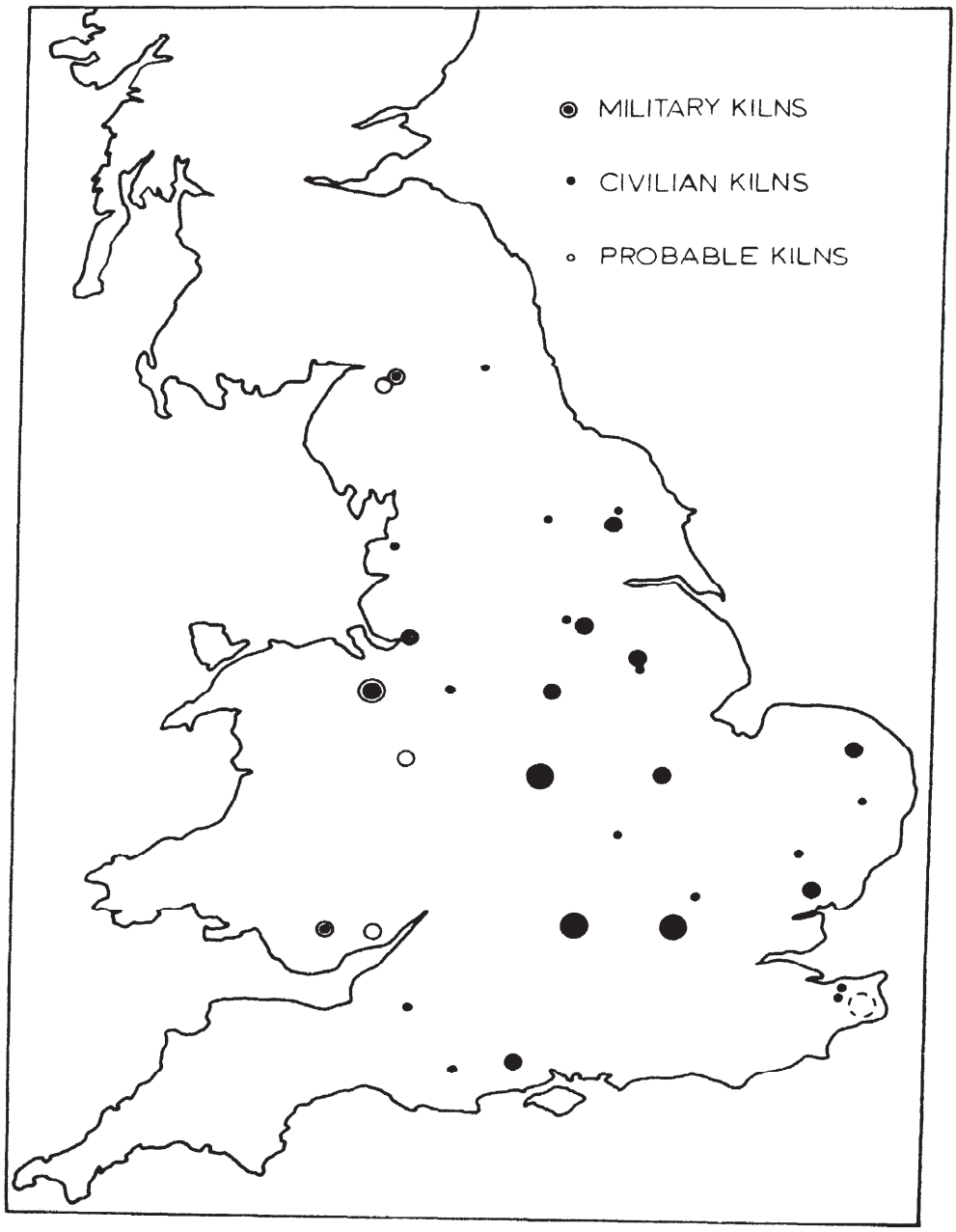


FIG. 5. Potteries and Kilns producing Mortaria.

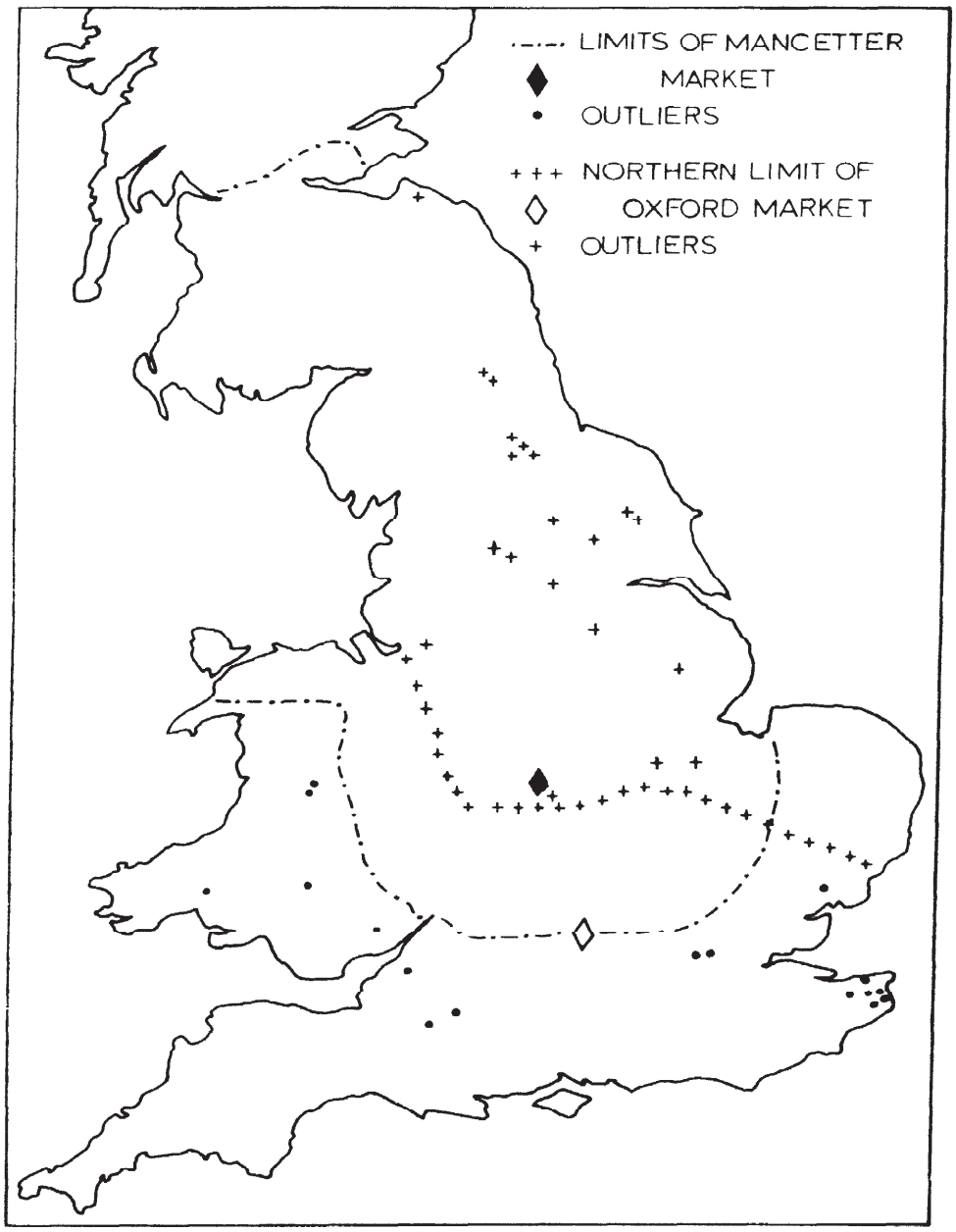


FIG. 6. The Markets covered by the Mancetter-Hartshill Factory and the Oxfordshire Kilns.

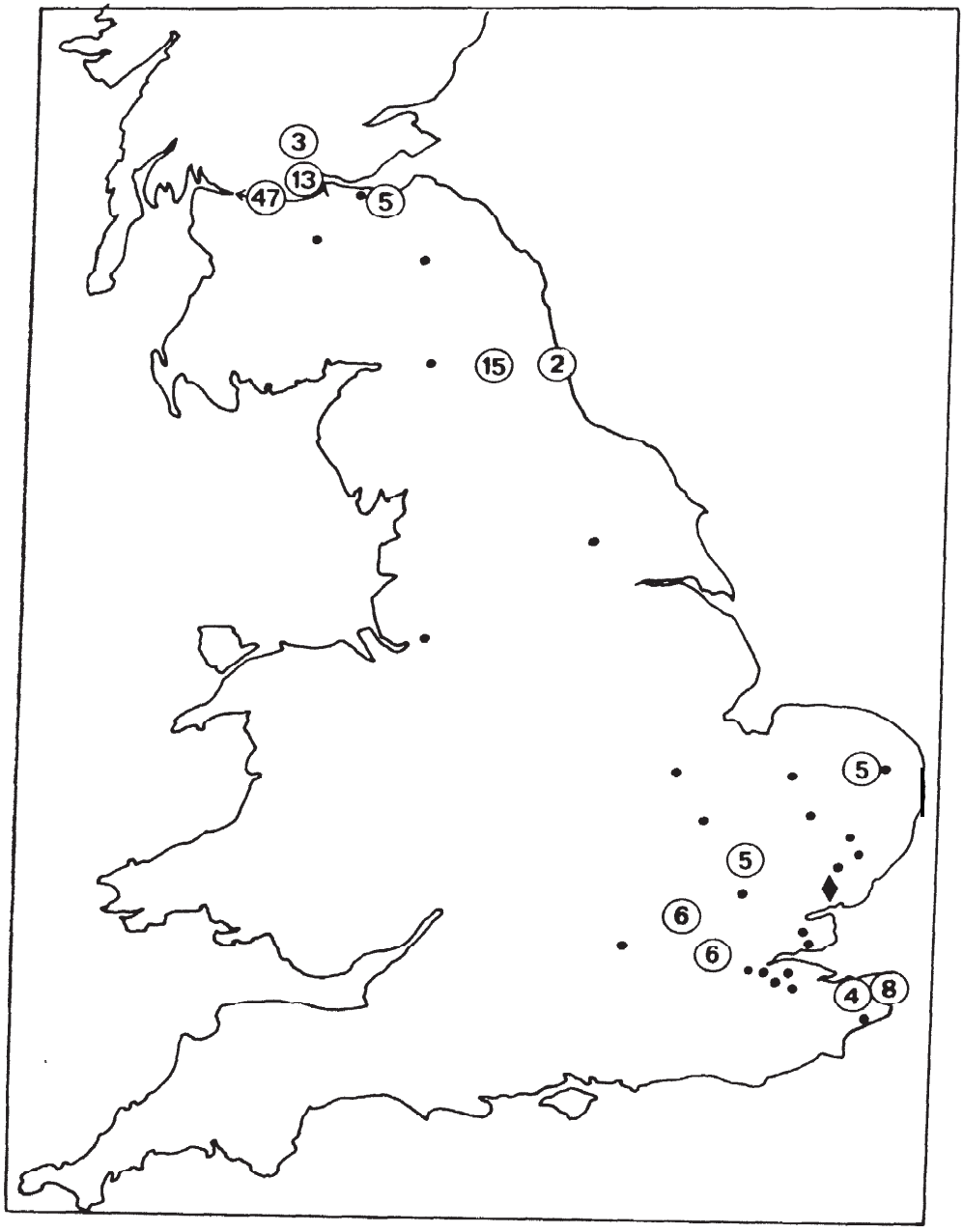


FIG. 7. Stamps of the Potters working at Colchester within the Period A.D. 140-200.

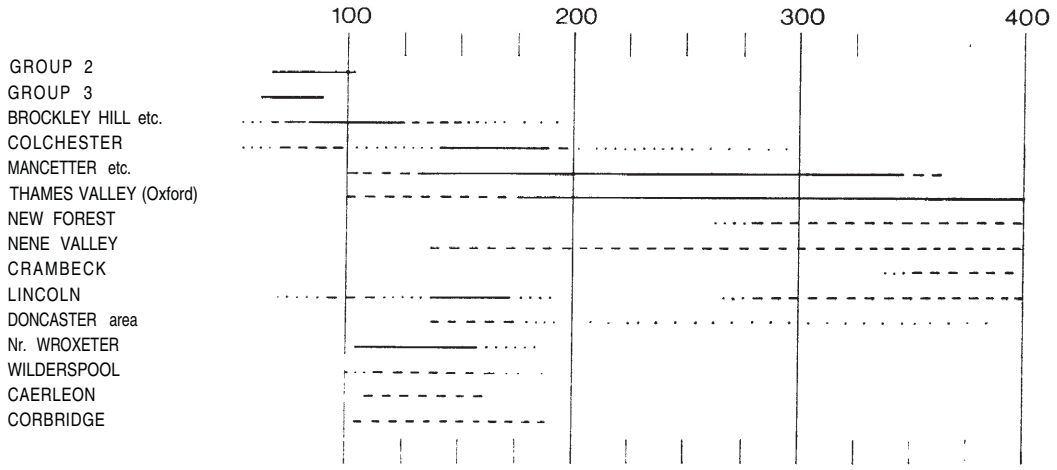


FIG. 8. Summary of the activities of potteries producing mortaria in Britain. Solid lines indicate major production with wide distribution; broken lines moderate production, but wide distribution; dotted lines indicate modest production for local markets.

SOURCES OF POTTERY FOUND ON NORTHERN MILITARY SITES

JOHN GILLAM

THERE were no permanent garrisons in northern Britain before the Flavian period. The first thing, which strikes anyone who examines the Flavian pottery of the northern region, is that it is not regional. To anyone who has handled contemporary pottery from elsewhere, it appears ordinary and familiar. Parallels to the pottery from the earliest levels of sites in Scotland and northern England are to be found over much of the rest of Britain. They are also to be found along the Rhine (Gose, 1950, types 188, 230, 239, 252, 260, 368 and 374), that is in Switzerland, Alsace, Germany and the Netherlands. An exact parallel to one type has been noted at Dinogetia on the lower Danube. This might seem to imply that the pottery came, either from overseas sources, or from sources elsewhere in Britain. A closer examination of the pottery found within the region shows that, similar as the vessels of any one class are to each other, they are not identical. There are subtle differences which might be called sub-regional. The differences are not so great, for example, as between vessels of the same class made, and mainly used, in different *civitates,* in post-Hadrianic times. Rather, the differences between vessels on separate northern military sites are of about the degree which might be expected if different groups of potters had been trying to do the same thing, and had succeeded up to a point.

The carinated bowl with the reeded rim provides the best illustration. At Corbridge (Richmond, 1953b, Fig. 9, no. 7), throughout the Flavian and most of the Trajanic period, the rims are softly moulded on the upper surface, and not strictly reeded at all. At Inchtuthil they are short with two sharp square-section reedings. At Mumrills (Macdonald, 1929, Fig. 101, nos. 1 and 2, and Steer, 1963, no. 84) they have three deep reedings. Newstead (Curle, 1911, Fig. 26) and Chesterholm (Birley, 1938a, no, 54) show other minor variations. Carlisle (Hogg, 1956, Fig. 4, nos. 1 and 2) rims are broader than those from Inchtuthil, but more markedly reeded than those from Corbridge. Rims from Kirkby Thore (Charlesworth, 1964, Fig. 5, no. 37, and 6, nos. 3 and 5) and Brampton resemble those from Carlisle, but when actual specimens from the three sites are compared, it is clear that they are not from the same kilns. The mention of Brampton provides the key to the problem of the wide variations within the limits of general similarity. A tilery and pottery at Brampton (Hogg, 1965), near Carlisle, produced a wide variety of classes and types, including carinated bowls, mortaria and grey jars. These are generally, but only generally, similar to those from other sites. Brampton doubtless supplied the Stanegate fort of Old Church between A.D. 105, or a little earlier, and A.D. 125, and nowhere else. Brampton is one of very few auxiliary works depots to have been identified in northern Britain. There was a roughly contemporary depot at Muncaster, near Ravenglass, which supplied Hardknott. Quernmore (Richmond, 1954, 12), near Lancaster, made tiles and pottery for the *Ala Sebosiana* at a later date; tiles, but not apparently pottery, were made at Mumrills in the second and South Shields (Richmond, 1953a, 4) in the fourth centuries. Brampton and Muncaster remain the only

securely known pre-Antonine auxiliary potteries in the region. At Scalesceugh, near Carlisle, stamped tiles of Legio IX *Hispana* have been found, together with pottery vessels of unusual types which may well have been locally produced in the pre-Antonine period; there was also pottery of common types which had been produced at a much later date in factories outside the region. This does not take things very far, but a recent geophysical survey has revealed numerous kiln sites, and Scalesceugh may yet prove to have been an important works depot. We may in any case safely postulate undiscovered auxiliary works depots in addition to the handful of known examples. These depots, each working in its own way, but all within the same widespread tradition, would account both for the pottery variations, and for their nature.

Nevertheless much of the pottery clearly came from outside the region. Gallo-Belgic *terra nigra* reached Corbridge (Richmond, 1953b, no. 32) and Burrow in Lonsdale (Hildyard, 1954, no. 4). Related types of rough-cast beaker, each with a double cornice rim, some indented and some unindented, are widespread in northern Britain (Birley, 1938a, no. 53). Parallels on the Rhine (Gose, 1950, type 188) are so close, in fabric as well as in form, as to imply importation from there. Mortaria, on the one hand from north-east Gaul, and from Kent, and on the other from the Verulamium region, are widely and evenly distributed. More than one variety of rustic ware reached the region (Birley, 1938a, no. 38). None can be assigned firmly to North Hykeham (Thompson, 1958), near Lincoln, in particular, but all probably came from the Coritanian region. The grey jars, when not locally produced, might have come from almost anywhere. The chance find of a kiln, followed by the analysis of fabrics, would be needed to make it certain, but hints given by somewhat later vessels from Lincoln racecourse (Corder, 1950) on the one hand, and from Cantley, near Doncaster, on the other, suggest the general region from which the grey jars may have travelled to the frontier.

Under Hadrian there was a marked change. Both Muncaster and Brampton closed down as military depots, and if Scalesceugh was a depot of Legio IX *Hispana* it may well have closed down, too. Quernmore was, of course, active later, as were the pure tileries. The pottery within each class became much more uniform. This uniformity, which is characteristic of the northern pottery for most of the Roman period, implies that all the inferred auxiliary works depots, the sources of the earlier varieties, had also closed down. This may have happened as forts were evacuated in consequence of the new troop dispositions, new depots not being opened. Civilian potters, or at least potters who stamped their wares, began work in the Brampton-Carlisle area (Birley, 1948, 175), using the same clays as had the military potters. Two of these potters may have migrated from Wilderspool, near Warrington. Their stamped mortaria are common and wide-spread in northern England, only slightly less common in the north-east than in the north-west. They also found their way to Scotland, in fair quantity, as soon as it was re-occupied, early in the next reign.

Another marked change, and one which may have been a consequence of the changes already noted, was the introduction of black-burnished kitchen wares. Taken together, the two main categories of black-burnished kitchen wares became the commonest ware in northern Britain. Between the second quarter of the second century and the third quarter of the fourth, they were commoner than all other wares put together. They were used for almost all the bowls, dishes and cooking-pots. One category of the new wares arrived in the north, that is on the line of Hadrian's Wall, and in its hinterland, in *c.* A.D. 120. Its arrival in Scotland, apart from Birrens, came later. The date is fixed by reference both to the Stanegate forts (Forster, 1912, no. 44, Birley, 1938a, 37, Gibson, 1909, no. 5, and Simpson, 1913, Fig. 26, no. 15), given up in the mid-120s, in

five of which the ware has been noted in small quantities, and also, by complementary argument, by reference to the turrets and milecastles, founded in the early 120s, where it appears in primary levels, still in small quantities (Woodfield, 1965, 5 lb, no. 1). The date is one of the most secure in the history of Roman pottery in Britain. At first the black-burnished vessels made little headway against the carinated bowls in oxidized or light-grey fabrics, or against the grey jars. The grey jars began to imitate the plain cut-away base and the cross-hatched decoration of the newly introduced cooking-pots. Re-designed grey jars were made in Cantley, Lincoln and North Hykeham, among other places. It is not certain how many of those found in the north came from that region. In the earliest occupation level in the turrets and milecastles, grey jars outnumber cooking-pots by almost 4 to 1.

It has long been widely appreciated that those black-burnished wares which are commonly found in northern Britain, fall readily into two categories, usually simply numbered 1 and 2. Each category is found in other parts of the province, though only in Scotland and north-eastern England are they found in quantity side by side. Spectrographic analysis by Mrs. E. E. Richards of the black-burnished wares from Mumrills west ditch revealed two distinct fabrics, each homogeneous in itself (Steer, 1963, p. 129); these were lettered A and B. While at Mumrills the correlation between A and 1, and between B and 2 was complete, vessels from elsewhere, which have not been physically analysed but have been assigned to categories according to their form, or to the appearance of their fabric, need not be identical with either fabric A or fabric B. In other words, the vessels in each of the two main categories were not necessarily all made in the same centre, though those in each category supplied to Mumrills certainly were. It is both more convenient and less ambiguous to refer to vessels whose precise composition is unknown by numbered categories rather than lettered fabrics; this may be in abbreviated form as BB1 and BB2.

BB1 was the first to arrive in the north, *c.* A.D. 120. At that time it was completely homogeneous in character, and, on the face of it, would seem to have been the product of a single factory. Unlike the small contemporary mortarium factories, that factory was outside the region, to the south, and somewhere in the western part of the province. There had certainly been a change in marketing or requisition. Instead of local military kilns on the one hand, and kilns in the eastern part of the province, south Yorkshire, Lincolnshire, Hertfordshire and Kent on the other, being the main sources, these were supplemented or replaced by a major source in the west.

The invasion and re-occupation of Scotland in *c.* A.D. 140 changed the main concentration of consumers. As many as forty-seven new forts were built between Corbridge and Bertha; these housed the greater part of the Roman army in Britain. The pattern of pottery flow changed as troop dispositions changed. The pottery ships no longer ran mainly from the Bristol Channel to the Solway Firth, but from the Thames Estuary to the Firth of Forth. BB2 made its first appearance in Scotland precisely as the Antonine Wall was being built, just as BB1 had made its first appearance in northern England precisely as Hadrian's Wall was being built. A later date than *c.* A.D. 140 has been suggested for the first arrival of BB2 anywhere in the north (Gillam, 1970a, 32). This now appears to have been erroneous.

There is not yet complete all-round agreement on the date of the end of the occupation of the Antonine Wall. For several decades a date around A.D. 184 or 186 has been most widely accepted though dates as late as A.D. 197, 207 and 211 have been put forward. It now appears that all these dates are too late. The absence of any samian, or any stamped mortaria, dated to later than *c.* A.D. 160, save for a very small number of

much later pieces from sites where their presence is explicable, from any site north of Newstead, combined with the fact that it was precisely in A.D. 162-3 that Corbridge, always linked with Scotland, ceased to be a fort, strongly suggests that it was then that the Antonine Wall was given up. If this is so, and there are difficulties, the Antonine occupation was brief, lasting barely more than 20 years, though, even so, this was three times as long as the Flavian occupation. During this twenty years vessels in BB2 were common; they outnumbered those in BB1 by 5 to 3. To have won so large a share of the market in so short a time BB2 clearly began to be shipped to the Forth as soon as its ports were once more in Roman hands. This confirms the inference already made that the change in distribution patterns coincided with the change in troop dispositions.

BB2 was almost certainly made at or near Colchester. Some of the known Colchester products have, on external comparison and without physical analysis, a degree of similarity to third-century specimens of BB2 from Haltonchesters great enough convincingly to suggest a common origin. BB2 was not the only Colchester product to reach northern Britain. Mortaria, some with name stamps, but more with what are usually described as herring-bone stamps, are common in Scotland (Hull, 1963, 110). They are also common at Corbridge, though they may not have reached there until after *c.* A.D. 160. Except within a radius of 50 miles of Colchester itself they are rare everywhere else. As the occupation of Scotland was so short it is possible to examine a cross-section of the sources from which mortaria were supplied to Scotland. A very few stamps are confined to Scotland; these may be local products. Kilns outside Scotland which supplied it with mortaria include those at Brampton/Carlisle, Colchester, Corbridge, Hartshill/Mancetter and South Carlton (Birley, 1948). The area between Lincolnshire and the Thames continued to be represented, as it had been in pre-Hadrianic times, but additionally the Tyne-Solway isthmus on the one hand, and Warwickshire on the other, had broken into the market. The Thames estuary was probably the source of the poppy-head beaker. These beakers, in their fine dark fabric, are found fairly frequently in Scotland (Steer, 1963, no. 63). An unstratified example from Housesteads (Gillam, 1970b, type 70) is typologically pre-Antonine, which implies that imports began before the advance to the north. imports certainly continued after the withdrawal from Scotland, for several examples, including one unbroken vessel which cannot have survived as rubbish, have been found in deposits of *c.* A.D. 180 at Corbridge (Richmond, 1950, no. 9). Dales ware (Gillam, 1951) is unknown in Scotland. It is also absent from second-century deposits in northern England. It clearly was not imported so early, even though it may have begun to be made in its Coritanian homeland. An example of Derbyshire ware, typologically undeveloped, has been recorded at Balmuildy (Miller, 1922, p1. 45, no. 29). This is the only known Antonine example found so far north; that from Carpow may be third-century (Birley, 1965, fig. 8, no. 6). The ware is absent from second-century deposits in England north of Yorkshire, and, clearly, large scale imports had not begun. It was during the Antonine occupation of Scotland that the first castor beakers reached the north. It is not certain whether they were products of the Nene valley, of Colchester, along with much of the kitchen ware and many of the mortaria, or of yet another centre, though Colchester seems not unlikely for the earliest arrivals. The vessels all belong in any case to the same tradition. They are fine, rather small, and broad in proportion to their height. On those with hunting scenes, the animals are naturally proportioned, and softly drawn with rounded muzzles. They contrast markedly with the specimen, of two thirds of a century later, from Waternewton Kiln A, or the often photographed specimens from Corbridge, with their rakish long-muzzled animals. The so-called hunt-cups are not the only castor

beakers to have reached Scotland, or second-century deposits in northern England. They belong to series well known in the third century in the areas of production but are markedly less developed. As the vessels appear at all in Scotland, north of Newstead, it inevitably follows that they were already on the market by A.D. 162-3. For some time now most students have accepted Dr. Kathleen Kenyon's date of *c.* A.D. 170 for the beginning of the production, or of widespread marketing. of fine castor ware (Kenyon, 1948, 120). Slightly earlier and slightly later dates have alike been suggested. The new evidence makes acceptance of an earlier date inescapable. The actual quantity of castor ware from Scotland is small. While it is never abundant, even in northern England, later in the second century or in the third, it is uncommon enough in Scotland to make it appear that, unlike BB2, it arrived there late rather than early in the period of occupation, possibly not much more than a decade before Dr. Kenyon's date.

While Scotland was occupied, the Tyne-Solway gap was almost devoid of troops. The turrets and milecastles were empty and the Wall forts held by small detachments. The total garrison was probably about one tenth of what it had been. Behind the Wall Carlisle, whatever its status at the time, was occupied; Corbridge was held by a *cohors milliaria equitata,* and South Shields was held. With so small a garrison pottery supply presented no problem at the time. There was, however, for long a problem of interpretation. At Corbridge, the only site on the isthmus with a clear-cut structural level, externally dated to the early Antonine period, and containing substantial quantities of pottery, much of the pottery is, not surprisingly, similar to that in Scotland (Birley, 1938b, figs. 7–9, Richmond, 1952, fig. 4, and Richmond, 1955, fig. 5). Over and over again the precise types of pottery recorded in Scotland are recorded at Corbridge, in either the early- or mid-Antonine levels.

Ring-neck and flanged flagons, costrels, narrow-mouth jars, flasks, poppy-head jars, rough-cast and castor beakers of several types, cooking-pot shaped grey jars, campanulate and segmental bowls, and a wide variety of beakers, cooking-pots, bowls and dishes in BB1, are not only found both in Scotland and Antonine Corbridge, but they are so very similar in detail of form and fabric that it is almost completely certain that identical sources were shared. Among the potters whose stamped mortaria reached the same two markets were Austinus, Bellicus, Bruscius, Crico, D.N.C., one of the Dociles, Gratinus, Icotascus, Imemituobon, Loccius, Masculus, Matutinus, Minomelus, Mossius, Sarrius and Similis, representing between them sites of manufacture in Cumberland, Lincolnshire, Northumberland, Warwickshire and the West Riding (Birley, 1948). The Central Gaulish pottery used in the two areas came from the hands of the same potters. The similarity, far greater than in the Flavian period, is impressive, and this kind of similarity, between sites so far apart, is probably without parallel elsewhere in the province, at this period. Yet it can hardly mean that Corbridge was a ceramic depot for Scotland, for sea transport was so much more efficient and economical that it was almost certainly used.

There is an important difference between the otherwise similar assemblages. The commonest single fabric in Antonine Scotland, BB2, is absent from the early-Antonine levels at Corbridge. It is also absent at all periods from Carlisle, and its earliest recorded appearance at South Shields is in the filling immediately below the early third-century granaries. It is as though ships from the Thames estuary unloaded none of their cargo in the Tyne, on their way to the Forth. The black-burnished requirements of the Tyne-Solway isthmus were met by BB1, which was probably imported by way of the Solway. It was the absence of BB2 from northern England, before *c.* A.D. 160, which led to the

late dating of its arrival in the north as a whole, and also, among other considerations, to the late dating of the evacuation of the Antonine Wall.

When the Antonine Wall was evacuated, and Hadrian's Wall was re-occupied, in *c.* A.D. 163, BB2 began, at last, to be supplied to Corbridge, to South Shields, and to the eastern half of the Wall. BB2 is recorded in north-western England twice only, at Bewcastle, though BB1 is abundant. There also seems to be, after surface inspection only, a third category of black-burnished cooking ware, which resembles BB1 more than BB2 but is not identical with either. As the terms are normally used it is probably best to regard it as a variety of BB1. In the north-east the use of BB2, in the turrets and milecastles, was sparing. It is hard to understand why, for a single ship could probably have carried enough to keep all the turrets and milecastles on the eastern half of the Wall supplied for quite some time, and the ships were no longer sailing beyond the Tyne. Nevertheless, it remains a fact that while BB2 was actually present in the following turrets : *7b, 18b, 25b, 26a, 35a* and *48a* (Woodfield, 1965), as well as among material from certain long-unpublished excavations in the central sector, quantities were absolutely and relatively small, smaller than in Scotland in the previous reign. This anomaly, not unnaturally, made it difficult at one time to reach acceptable conclusions about the chronological relationship between the two frontiers (Gillam, 1970a). While rare in the turrets, and so far unrecorded in the milecastles, except in typologically later forms, BB2 is nevertheless abundant in the forts, and behind the Wall. At Benwell (Swinbank, 1955) Chester-le-Street (Gillam, 1968), Corbridge (Richmond, 1950) and Haltonchesters BB2 is as common, relatively, as in Scotland. A sealed Corbridge deposit of *c.* A.D. 180, once dated to *c.* A.D. 200, has a slightly higher ratio of BB2 to other wares than most Scottish groups, except the group of *c.* A.D. 160 from Mumrills, which it matches fairly closely. An explanation of the difference between the smaller and larger posts will doubtless emerge in due course. In the meantime the idea, which has been put forward, that the forts continue in occupation longer than the turrets and milecastles, within the second or early third centuries, seems no longer tenable for other reasons; separate supply to the two classes of structures is a possibility, and there is other evidence for this, though it seems a strange procedure; the groups from the turrets and milecastles are small, making statistical analysis hazardous, though it remains true that they all tell the same story, and that, taken together, they form a substantial group. While BB2 was common, at least on some north-eastern sites, BB1 did not become a discontinued line, but continued to account for about a third of the cooking-vessels used.

The mortaria used in the north of England after the withdrawal from Scotland, continued to come from the same centres which had supplied Scotland—Lincolnshire and Warwickshire among them. Cumberland production seems to have contracted somewhat, while Corbridge production expanded, and the vessels reached markets in the Pennines, on the east coast and as far north as Newstead, though no further. Colchester mortaria, common in Scotland immediately before, began to come into north-eastern England. The stamped Colchester mortaria in the Corbridge collection, numbering at least 15, which is more than from any other site except Colchester itself, are for the most part old finds. The record of stratification is often absent or difficult to interpret. The more recent finds, however, have come, without exception, from deposits of later than A.D. 162-3; that is never from the earlier Antonine deposits. The pattern is exactly the same as for BB2. Occasional examples of the so-called Raetian mortaria, with their lugs and deep red gloss, reached the north-east in the mid-Antonine period. Just as BB2 is scarce in the turrets and milecastles so is castor, of any kind, in spite of

its having previously reached Scotland; hunt-cups and other fine castor vessels are, however, represented in contemporary deposits at Corbridge and elsewhere in the north-east. A particularly fine typologically early example comes from Benwell (Gillam, 1970b, type 84). Castor types other than beakers began to appear. From Newstead, which continued in occupation for a couple of decades after the withdrawal, comes part of the lid of a castor box. This is the earliest dated example from the north, and one of the earliest from anywhere, of a class of vessel which, in various forms, persisted throughout the third century, and well into the fourth. All the examples of castor ware referred to here have the appearance of Nene Valley products. Central Gaulish samian continued to be imported in quantity, and Lezoux products, over and above what is usually called samian, also reached the north in mid-Antonine times.

The destruction of Hadrian's Wall in *c.* A.D. 180, and of many forts and settlements in its immediate vicinity, provides a valuable datum line for pottery. There is a clear-cut dated distinction between successive deposits on a number of separate sites, linked as part of one system, and there are indications of changes of source at that time. These changes may have been consequences of the military activity, though marked changes in the morphology of continuing type-series were probably coincidental. When the second main period of the occupation of Hadrian's Wall began, the importation of stamped mortaria ceased. Even without their help in the late second century and subsequently, unstamped mortaria remain better indications of source than many other kinds of pottery. To judge from fabric and form, Warwickshire continued to be a major supplier. The Nene Valley was well established as a new major supplier of mortaria by A.D. 270 at the latest (Richmond, 1938, figs. 22 and 23). The vessels were not colour-coated, though a small number of colour-coated mortaria arrived in the north in the course of the fourth century. Either there has been failure to identify their products, or the local suppliers of mortaria went out of business in this period. This is not unlikely, for the general tendency throughout the Roman period as a whole seems to have been for supply to have been increasingly concentrated in fewer and larger industries. BB1 continued strongly, if anything, even more strongly than before. The flanged bowl in BB1 replaced the flat-rimmed bowl early in the period.

There has probably been as much wrong-headedness, of one kind or another, about the history of the flanged bowl as about any other sub-class of Romano-British pottery. Errors made by J. P. Bushe-Fox (Forster, 1912, no. 71), Philip Newbold (Simpson, 1913, no. 105) and John Ward (Ward, 1903, no. 11) sixty to seventy years ago, led to a widespread and stubbornly held belief that the straight-sided flanged bowl first emerged before the middle of the second century. Bushe-Fox published a correction, by implication, not long afterwards (Bushe-Fox, 1913, 79–80) but this has tended to be overlooked. R. G. Collingwood crystallized the error in his comments on type 30 in the first edition of *The Archaeology of Roman Britain.* Since then examples of the sub-class, including fourth-century types, have often been ascribed in publications to the earlier part of the second century; the flanged-bowl is sometimes used to date a deposit, which says nothing about its date, and it is sometimes itself dated by direct association, which is a hazardous proceeding. It is, of course, true that bowls with flanges were current before the middle of the second century; imitations of samian Form 38, segmental flanged bowls, and a south-western vessel with a broad flat flange, in black-burnished fabric were, with others, all on the market by then. But the special sub-class, a straight-sided flanged bowl, truncated-conical in shape, in BB1, castor ware, lead-grey Crambeck ware and other fabrics, most certainly was not; it is this sub-class which was illustrated by Bushe-Fox, Collingwood, Newbold and Ward. The sub-class never appears on the

Antonine Wall, nor at Newstead, though it appears at Severan Carpow. It never appears in either of the second-century levels in the turrets and milecastles, nor in the second-century level of any fort on Hadrian's Wall. It never appears in any of the Antonine or earlier levels at Corbridge. This is hardly an example of differential distribution, for, when types within the sub-class do appear in the north, they are identical with the earliest types elsewhere in the province. The earliest types are clearly all products of the same centre. Those working in the north avoided the error of dating the start of the type-series too early, but fell into that of dating it somewhat too late. This was mainly due to the acceptance of the idea that the second main period of occupation of Hadrian's Wall ran from the first to the last decades of the third century. As typologically early flanged bowls appear in the deposits of this period, in small numbers, but not in earlier deposits, it seemed to follow that the type-series had started in the course of the third century, and a date of *c.* A.D. 220 was suggested. The discovery of numerous examples of the type at Carpow, and the re-assessment of the history of the frontier, make necessary an earlier dating. The first arrival of the flanged bowl cannot have been earlier than *c.* A.D. 180 or later than *c.* A.D. 210.

After the disaster, BB2 continued to be imported, or began to be imported again. Like BB1 it underwent typological change. Cooking-pots, which became slightly commoner, had true cavetto rims, bold and quarter-round. As other centres were also producing cooking-pots with cavetto rims, it is not always possible to say without autopsy which of them are BB2 as defined. Bowls and dishes took on a rounded rim, an exaggerated bead, of semicircular section, and lost their decoration. These are in typical BB2 fabric. and have numerous parallels at Colchester. They appear on at least a dozen sites of the Hadrian's Wall system, including several from which the earlier types of BB2 have not yet been recorded. Bowls appear twice at Birdoswald and once at Bewcastle, which are both at least as far west as the farthest western points, in England, to which the earlier types travelled. In addition to other examples from the site, a bowl and a dish have been found in separate parts of the destruction deposit at Corbridge, while a fragment comes from a turret which was dismantled, probably immediately, after the destruction. The change of type therefore took place before *c.* A.D. 180; it was, however, not long before, as the earlier types overwhelmingly outnumber the later. The later types occur several times at Carpow and at Cramond, both, of course, early third-century bases. A single example from Mumrills is inexplicable; the weight of other evidence makes it impossible either that the change of type took place before *c.* A.D. 160, or that the Antonine Wall was occupied after *c.* A.D. 180; activity in the third century, not amounting to re-occupation, cannot be ruled out. For an appreciable period the Colchester area continued to supply both northern England and those parts of Scotland which, from time to time, were occupied, but it did not continue to do so indefinitely. Most of the stratified examples of BB2, in its developed form come from deposits of the latest second century or of the third; a single example from a fourth-century deposit at Bewcastle was probably a survival. There was no further typological change, and on balance it would seem that the importation of BB2 ceased by the middle of the third century. The cavetto-rim form of cooking-pot, in a fabric other than BB2 lingered on for a few decades, for it was in use at Bewcastle when coins of the early 270s were in circulation.

At least one other category of cooking-ware reached the northern market in the late second century or in the third. It was grey rather than black but the forms were generally similar to BB1 and BB2 (Richmond, 1950, no. 82; Birley, 1930, no. 40; and Charlesworth, 1967, no. 19). Its place of origin is unknown, but may have been east Yorkshire.

Castor ware was relatively common in the third century. Except for the wide-mouthed jars, or bowls, which were common but had a local distribution, almost every type represented in Kiln A at Waternewton, has a parallel in the north of England. They are not all stratified, but in this case the kiln, and not the site, dates the vessels-to the earlier third century. Later developments of the same types also appear in the north; an example is a funnel-neck, indented, scale-pattern beaker from a late third-century deposit at Birdoswald. Nene Valley mortaria also reached the north, and doubtless formed part of the same consignments as the castor ware. Mr. N. H. Brewster has made a study of all the so-called Rhenish ware at Corbridge. It was remarkable how much there was, how homogeneous it was when false attributions were weeded out, and how closely it matched, in both fabric and form, the material actually found in the Rhineland. There was obviously considerable importation of a limited number of specialized wares from Lower Germany. Evidence of date was scanty, but the types never appear in Scotland, nor in northern England before A.D. 180 at earliest, while they do appear in third-century deposits, at Carrawburgh (Richmond, 1951, no. 12) and elsewhere.

The period of maximum importation would appear to have been between the close of the second century and the middle of the third. As we have seen, an early type of Derbyshire ware had reached Balmuildy by *c.* A.D. 160; another reached Carpow, probably in the third century. But it was not until well into the third century that a later type began to reach northern English sites in greater, though never overwhelming quantities. It has turned up at Bewcastle, Brampton civil site, Carrawburgh, Chesterholm, Corbridge and Housesteads. It was not always stratified, but when it was stratified the context was invariably of the third or fourth century. Dales ware might perhaps better have been called Coritanian ware; at the time the scattered references were first drawn together, more examples had been recorded in Yorkshire than in Lincolnshire and Nottinghamshire (Gillam, 1951). The position is now reversed. In the north the ware was on the market in the later third and earlier fourth centuries. There are many examples from dated contexts of this period, and none from earlier contexts. On the other hand there is evidence from Lincolnshire that the ware was already on the market there well before the later third century. This would appear to be another clear case, like that of BB2, of a newly developed ware or type failing to reach the northern military market until after a lapse of time.

In the closing years of the third, and in the earlier and middle years of the fourth century, many things remained little altered. Mortaria from both the east and west Midlands, and BB1, ever changing in form, but always in the same tradition, continued strongly. There was even the occasional castor beaker, in devolved form, from a dated context. Except for boxes and flagons, coarse castor ware was scarce. BB2 was only a memory. New arrivals included dishes and heavily-built cooking-pots in calcite-gritted fabric. This was not the shell-gritted Dales ware, but vessels with the chunky mineral grit of Knapton ware (Corder, 1932), or, as it is often called from one of its earliest findspots, Huntcliff ware (Hornsby, 1912). Other east-Yorkshire products were also imported, but not yet in a flood. In addition to Knapton ware, proto-Crambeck ware, Norton ware and Throlam ware have all been tentatively identified. These kiln sites are all in east Yorkshire.

In the late fourth century the east-Yorkshire trickle became a flood. Hardly anything is found in the north of England which had not been made in east Yorkshire. From other sources there was the occasional castor flanged bowl or mortarium, which might be as late as the late fourth century; there is a single mortarium from the Oxford region; and that is all. There was no New Forest ware, and there was no Farnham ware.

East Yorkshire products were overwhelmingly abundant. How abundant they were may be gauged from the fact that at South Shields in 1966 and 1967, there were more vessels of defined Crambeck (Corder, 1937) types, or of developed Huntcliff types, than there were vessels of all other types, from all the levels of the whole site, taken together, and this was in spite of the fact that developed Crambeck and Huntcliff types were on the market for less than one sixth of the total period of occupation. There is grey Crambeck ware; there is painted Crambeck ware; and there are Huntcliff cooking pots in overwhelming numbers. Between them they supplied the whole of the ceramic needs of Hadrian's Wall and its immediate hinterland, and most of the needs of the whole rectangular block of territory between the Mersey-Humber line and Hadrian's Wall. While the developed Huntcliff types reached two of the outpost forts of Hadrian's Wall, developed Crambeck ware does not appear at either of them. Neither ware appears in Scotland, not even at Traprain Law, though it has been stated in print that Crambeck ware does appear there.

Military production only accounted for part of the needs of the region, and that not for long. After this, local civilian production only accounted for part of its needs, and that not for much longer. Throughout there was some reliance on imports from farther south in the province, and, at times, and to a smaller extent, on imports from overseas. As time went on reliance was placed on a decreasing number of increasingly large factories. In the closing stages the region was supplied almost exclusively from a single factory. When this closed, it was thrown on its own inadequate resources.

SUMMARY

In the late first and early second centuries the northern garrisons were supplied with pottery, partly from their own small depots, and partly by civilian firms further south or overseas. Local civilian production subsequently replaced military production, though imports into the region continued and increased, possibly in fulfilment of military contracts. As time went on increasingly large factories took over the supply, until, in the later fourth century a single factory supplied almost all the needs of the northern garrisons.

THE BLACK-BURNISHED POTTERY INDUSTRY IN DORSET[1]

D. P. S. PEACOCK

BLACK polished pottery, now generally known as black-burnished ware, is one of the commonest types of Romano-British coarse pottery. It is abundant throughout the country on sites dating between the beginning of the reign of the emperor Hadrian and the end of the fourth century A.D. One of the main problems presented by this ware is that very little is known of its origins: the frequency with which it occurs and the uniformity of the forms suggest that a large factory or a number of factories await discovery.

In 1963, J. P. Gillam made an important advance in our knowledge of black-burnished ware while reporting on the coarse pottery recovered from the Mumrills fort on the Antonine wall. He recognized two distinct classes which he labelled *category 1* and *category 2. Category 1* black-burnished ware is tempered with medium-grained quartz sand while *category 2* contains fine sand and hence has a more silky feel. Furthermore, these two categories each have their own distinct range of typological traits suggesting that they may be the products of different centres. This was confirmed by spectrographic analysis which showed chemical differences (Gillam, 1963).

A few years ago I verified these conclusions using heavy mineral analysis (Peacock, 1967). All sands contain a very small proportion of mineral grains, such as zircon, garnet, tourmaline, etc. which are heavier than those constituting the bulk of the deposit. If these grains are present in sands they must be present in sand-tempered pottery and can be extracted by crushing the sherd and floating the powder on a heavy liquid such as bromoform. The quartz and clay, being lighter than the liquid, will float while the heavy minerals will sink, so that they can be separated and examined under the microscope. Much can be learnt about the origins of pottery by studying the different types of mineral present. As expected, *category 1* and *category 2* black-burnished ware gave distinct heavy mineral suites implying different origins. I was able to say very little about the precise source of *category 2* ware; however, mineralogically, it might originate somewhere in the eastern half of Britain.

Category 1 black-burnished ware was quite different. 75 per cent. of the mineral assemblages examined were characterised by a predominance of tourmaline. This is not a rare mineral, but it is unusual to find it in excess of zircon, and many heavy mineral residues had a tenor of 70-80 per cent.

This at once recalled the Upper Greensand of south-western Britain which has a high tourmaline content due to derivation from the Dartmoor granite massif. The heavy mineral assemblages from the pottery differed in other respects and so the Greensand was *not* the temper used in the pottery, but the high tourmaline content led me to suggest that the sand used may have been derived directly or indirectly from the granites of the south-west. Since the western end of the south-western peninsula is archaeologically

[1] A full account of the evidence for Iron Age and black-burnished pottery production in Dorset is in preparation. This paper is intended as an interim summary of the main conclusions to be fully documented later.

unlikely, I suggested a source in the eastern part, implying the counties of Somerset or Dorset. However, this suggestion was not received very enthusiastically and with good reason. A kiln on Lincoln racecourse had been making small quantities of black-burnished ware (Corder, 1950) and production is also known from Rossington Bridge, near Doncaster[2], which suggests that the centre of gravity of manufacture might be the north-eastern rather than the south-western.

However, new evidence has come to light which now confirms my original suggestion, and I believe that there is good reason to postulate the existence of an important production centre for *category 1* black-burnished ware in southern Dorset. This probably represents the persistence, into the Roman period, of an important Durotrigian Iron Age concern situated in the same area. It was certainly not the only centre producing black-burnished ware, but it may perhaps prove to be the most important.

The evidence for this is two-fold.

1. Examination of Durotrigian Iron Age pottery has shown that it has an identical composition to the tourmaline rich black-burnished ware.

2. Very recently R. A. H. Farrar (1969) published an account of possible black-burnished production waste from Corfe Mullen, Dorset, and at the same time he drew my attention to the Tertiary sands region, particularly the Wareham-Poole harbour area, as a possible source. Mineralogical examination of these sands shows that they have a high tenor of tourmaline, due to geological derivation from the Greensand of the south-west. Mineral assemblages from these sands match those from both Iron Age and Roman pottery in every detail, and I have no doubt that all are identical.

If we are to postulate the existence of an important industry in the Wareham-Poole harbour region there should be *archaeological* evidence of its existence. Here, at first sight, there are difficulties for only one kiln is known: that from Ower on the southern shores of Poole harbour (R.C.H.M., 1970b, 597). However, there are other sites in this region that have produced layers of ash with quantities of black-burnished ware, much of it reddened and, in some cases, cracked, warped and quite clearly production waste (R.C.H.M., 1970b, 592-3, 597-8, etc.). It is likely that much black-burnished ware was fired in bonfires rather than kilns and experiments carried out a few years ago by Extra-Mural students at Southampton University, showed that bonfires were an extremely efficient method of producing intensely black pottery. There is no reasonable limit to the number of vessels that can be fired at once, and it is possible to use cheap grade fuel. Since black-burnished cooking-pots are, typologically, a development of the Durotrigian pottery tradition there is no reason why the ware, like its predecessors, could not have been made in bonfires, and I suggest that the Dorset sites consist in the main of the remains of such firings.

At present, it is difficult to assess the full importance of this centre. During the Iron Age and throughout the first century A.D. the distribution was relatively local, although an unpublished piece from first-century contexts at Richborough[3] has the tourmaline-rich composition. However, from *c.* A.D. 120 onwards, black-burnished ware has a broad distribution, perhaps due initially to orders from the army: 75 per cent. of the analysed black-burnished ware from the west Midlands appears to have come from the Dorset source, but unfortunately statistics are not yet available for the rest of the country. However, the tourmaline-rich heavy mineral suite that we now recognize as

[2] Information from Mr. N, Loughlin.

[3] I am indebted to Dr. G. C. Dunning for drawing my attention to this piece. The heavy mineral analyses of this and the Mumrills sherd (No. FRB 705) were carried out by Mr. D. Williams, of the University of Southampton, who is now working on black-burnished ware.

typical of Dorset is found as far away as Mumrills on the Antonine wall, while in an east-west direction it spreads from Devon to Colchester and Kent. The ware does not seem to occur in any quantity on the Continent, but I have recently observed a black-burnished flanged bowl in Dieppe museum which, in view of its geographical position, may have originated in the Wareham-Poole harbour region.

All the indications point to a major industry in Dorset, but it must be emphasized that there are many other sources which may be more important, particularly in the north or east of the country. The next step must be to decide where else this pottery was made and to compare the productivity and distribution of these centres with the Dorset factory.

SUMMARY

This paper is a brief summary of the development of thought on the origins of black-burnished ware and contains an outline of evidence pointing to a major production centre in southern Dorset.

THE TECHNIQUES AND SOURCES OF ROMANO-BRITISH BLACK-BURNISHED WARE

R. A. H. FARRAR

INTRODUCTION

THE cooking pottery generally called 'black-burnished ware' has long been known to archaeologists under such terms as 'common black (or grey) ware' and 'fumed ware', the latter in the belief that it owed its dark clay body or surface to firing in a smoke-laden atmosphere (May, 1912, 32, 60). The present name, with a hyphen to indicate its appropriation for a special variety of pottery that is not unique in being black and burnished, has been widely accepted since J. P. Gillam first formally defined two distinct categories of the ware in his report on the coarse pottery from the fort of Mumrills on the Antonine Wall (Gillam, 1960-1), although he was using it occasionally as early as 1951 and approaching a distinction between these categories as early as 1950 (1951, 171; Richmond and Gillam, 1950, 186).

Its pre-eminence, for the student, among the cooking wares of Roman Britain is guaranteed by its widespread distribution—for its complete exclusion from a region has only been claimed on good authority, so far as the writer is aware, for the fenlands around the Wash (Hartley, 1970, 167)—and by its longevity, and in particular its dominance of the northern military market for some 250 years between the reigns of Hadrian and Valentinian. Its potential importance becomes clear when it is realized that the army's dependence upon Midland and southern sources of supply, rather than upon pottery industries encouraged or set up locally under its more immediate control, ought to permit a wide application, subject to safeguards, of pottery chronologies worked out in the first instance from the uniquely well-dated northern deposits. The ware or wares under consideration would make up to some extent by the frequency of their occurrence for what seems at present to be a certain bluntness as a tool due to the conservatism of their tradition founded in the Iron Age of southern Britain.

The necessary safeguards are, firstly, that we should be prepared to allow for the likelihood of an earlier emergence of a type in its region of origin before the placing of army contracts, and perhaps while they existed (if we suppose that initiative in developing new forms remained with the potters), and for the possibility of later production for a smaller market after their ending. Secondly, we should insist on a sounder identification of wares, based on identity of fabric and finish as well as on similarity of shape, than is often achieved by comparison with illustrations that frequently iron out rather than draw attention to significant differences in potting techniques.

The principal objects of this essay are therefore (i) to examine certain technological aspects facilitating distinction between different varieties of black-burnished ware, and between these wares and some others of similar form and decoration which may or may not have been used for cooking; (ii) to amplify and to some extent correct the definitions at present offered for the two categories distinguished by Gillam, and to draw attention to the existence of other varieties of black-burnished ware that fall into neither of these categories; (iii) to review the archaeological evidence bearing on the

sources of Gillam's Categories 1 and 2.[1] It is not proposed to attempt any thoroughgoing review of the typological sequence and dating of the wares, both of which are aspects studied by Gillam within the context of their use by the northern garrisons between *c.* A.D. 120 and *c.* A.D. 370 (Gillam, 1970, 14-16, 18-19, 23-4, 31-2, 33; Gillam and Mann, 1970, 30-6).

Some points of principle must be made before we can proceed. It has been suggested (C.B.A., 1969, 5) that the term 'black-burnished ware', in its specific sense, can be restricted to the common forms of cooking-pots, bowls and dishes described in the succeeding section of this paper, and dated from *c.* A.D. 120, or in other words from the time of the appearance in the northern military sites of what we would now call Category 1; and, further, that it would exclude earlier 'fabrics' common in southern Britain. A southern Iron Age ancestry, Durotrigian although not explicitly stated, has, however, been recognized for the distinctive 'cooking-pot' since the 'Roman and Native' conference in Dumfries in 1953 (Gillam, 1958, 77), and the writer proposes to show not only that there was an ancestral connection, but that the distinctive fabric of Category 1 was developed there, and that the industry had and continued to have, almost certainly into the fourth century, a share in the supply of the army.

If this is so, it is obvious that a vessel of any shape or purpose that is habitually made of the same clay, by the same techniques, and in the same factories as the cooking-pots and other common forms supplied to the garrisons, must also be called black-burnished ware; and though it would be inappropriate to make more than passing reference to some of these less common forms as occasion demands, since they are in the main of regional rather than national importance, it will not be thought surprising if we find, in the region where black-burnished ware was first made, that there had existed and continued to exist a wider range of forms than was ever marketed on any large scale outside it.

The principle involved would be no less sound even were there no direct connection between the Durotrigian industry and the larger British market, and we shall insist throughout, for all wares, that any category based, as are those under review, on form, fabric and finish, must embrace all wares, irrespective of origin, that do not present features by which the informed eye can separate them. Scientific analysis will create its own scientific categories, sometimes several within one archaeological category, and will help or enable us to determine sources and assign markets, but unless it has determined an exclusive single source, allowing us to substitute a name for a number, or has enabled us to distinguish, as peculiar to each scientifically separated group, visually distinctive features that were submerged in the mass, the archaeological category must remain as a basis of classification.

ACKNOWLEDGMENTS

It was John Gillam's characteristic generosity, in travelling many miles on several occasions at the writer's request to lecture and exhibit specimens of black-burnished ware from the northern frontiers, that led to the present attempt to demonstrate a connection between the primary industry in the South and the sources of the northern units' supplies; and it was Henry Hodges who encouraged the writer's doubts as to the accuracy of some long-held assumptions about the techniques of pottery manufacture

[1] The alternative use of the terms category A and B, borrowed from the A and B groups of Mrs. Richards' spectographic analysis of clays in a selection of mid- or later second-century sherds from Mumrills (Gillam, 1960-1, 127-32), is to be deprecated in that it suggests that all black-burnished vessels of these two archaeological categories must necessarily yield the same results under scientific analysis.

behind some well-known Iron Age and Roman wares. For these stimuli, and for much patient advice thereafter, he is glad to record his thanks.

His debt is also gratefully acknowledged to the many institutions and individuals who have given aid, and in particular to the following for the loan of material for comparative study, scientific analysis, and exhibition, or for other special help: Dorset County Museum; Corbridge Excavation Committee; National Museum of Antiquities, Edinburgh; Tullie House Museum, Carlisle; Museum of Antiquities, Newcastle-upon-Tyne; Colchester and Essex Museum; Guildhall Museum, London; Red House Museum, Christchurch; Lincoln City Museum; Doncaster Museum; Somerset County Museum; Archaeology Museum, Kingston-upon-Hull; Ribchester Museum; Sheffield City Museum; Verulamium Museum; Maidstone Museum; Hunterian Museum, Glasgow; Institute of Archaeology, University of London; Department of Archaeology, University College, Cardiff; N. H. Field; P. A. Brown; Dr. D. P. S. Peacock; P. J. Tester; Mrs. M. Langdon; M. W. Brassington; Miss D. Charlesworth; P. C. Buckland; M. J. Dolby; Dr. A. S. Robertson; I. N. Hume; A. Miles; W. J. Rodwell; H. J. M. Green; K. T. Greene; G. Coppack; Dr. A. K. Knowles; Dr. G. C. Dunning.

GENERAL CHARACTERISTICS OF BLACK-BURNISHED WARE

The standard black-burnished ware 'service' consists of a jar (the 'cooking-pot'), a bowl, and a dish or 'platter', all three with a range of rim forms in contemporary use as well as several appearing in the course of evolution. To these we may perhaps add, as in less common but perhaps equally widespread use, a handled beaker, and a storage jar, although the latter has been little noticed and may well have served a dual purpose, being in its more usual form no more than an enlarged version of the cooking-pot, standing some 15 in. (38 cm.) high compared with the cooking-pot's normal range of between about 6 and 10 in.

The cooking-pot, sometimes with bead-rim in the earlier phases of the industry but generally with some kind of upright-necked or everted rim, is commonly decorated with a pattern, usually of lattice, tooled or 'scribed' with a blunt point—rarely deeply impressed and never genuinely incised—almost invariably on an unburnished and unsmoothed matt zone on the belly of the vessel. It is as well to emphasize here that the form, so decorated, was by no means peculiar to black-burnished ware, although it certainly originated in it; nor were the bowls and dishes, although here we cannot be so sure where the forms were first developed.

These bowls and dishes, the distinction between which is sometimes marginal even where a complete profile remains,[2] share matching rim forms, grading from an altogether plain rim (rare in bowls), through grooved or beaded and rounded or 'rolled' forms, to a relatively flat projecting lip ('pie-dish rim') similar to that of a modern glazed earthenware dish designed to seat the edge of a pie-crust, and so to a flanged form, at the other end of the scale, in which the projection is set off below the level of the brim. Decoration, similarly tooled, and common enough although more often omitted than it is with the cooking-pots, takes the form of close or open lattice, overlapping chevrons or arcs, continuous wavy or zig-zag lines, or a hatching of vertical or oblique lines, executed on a burnished or smoothed outer face but never, so far as we are aware, on a wholly untreated matt zone as in the cooking-pots.

Evolutionary trends are principally seen in a growing attenuation of the body of the cooking-pot unmatched by any equivalent diminution of the aperture, which in use still

[2] Gillam's definition, in which a dish has a maximum diameter three times or more as great as the height, is preferred (Richmond and Gillam, 1950, 183). The difference in proportions is, however, usually substantial.

needed to admit the hand, and at least to some extent in the bowls and dishes by the disappearance of basal chamfer, where originally present, and of the flat of 'pie-dish' form of the projecting rim in favour of the flanged form. They are also seen, or suspected, in certain changes in the decoration, most notably and reliably in the development upon cooking-pots, about the middle of the third century, of a narrow zone of obtuse-angled lattice in place of the wide zone of acute-angled lattice.

Colour, although the most difficult of all criteria to follow in practice, is manifestly an essential part of the definition of our ware. It is clear that a black or dark grey surface was preferred, that burnishing prior to firing enhanced its depth, and that a slip that would do the same was sometimes applied, or perhaps worked up with the wet hand from the clay body of the vessel, before burnishing.[3] Gillam's suggestion, in discussion, that the colour was desired because it absorbed heat more rapidly and concealed the soot of the open fire in cooking, is attractive, although both the southern pre-Roman and the continuing regional Roman industry also employed the same finish for more decorative table wares, flasks, and storage jars, which were never intended for the fire or gridiron.

The chemistry behind it is perhaps too readily assumed in contemporary literature enlightened by no more science than the writer possesses. While it is certain that a brown or red body is the result of *oxidation* of the iron compounds present in the clay through firing in an oxygen-rich atmosphere, it by no means follows that our common black wares, or indeed our grey wares, owe their colour to *reduction* of these compounds —that they are, in fact, reduced fabrics. For while the condition of our wares implies that the atmosphere in a later stage of firing, at least if a conventional kiln was used, will have been oxygen-starved and therefore in a general sense a reducing instead of an oxidizing one, the temperature achieved may have been insufficiently high or the firing not long enough sustained for reduction to begin or reach completion. The colour of our wares may equally well have been due to failure to burn out carbon resulting from combustion of organic matter present in most impure clays, or indeed to a deposition of carbon on the surface and through the pores in a deliberately smoky firing (soot-soaking), or to a combination of some or all of these factors; the more intense blacks are in fact particularly likely to be due to soot-soaking, unless there is evidence to suggest the use of iron-enriched slips (Shepard, 1968, 103-06, 219-21; Hodges, 1965, 40-1).

Difficulties arise in identification not only because the colour of surfaces and body may have been wholly or partly altered in use or by subsequent accident, but also because the primitive potter had imperfect control over firing conditions and only the simplest rule-of-thumb means of judging them. But while the casual discolouration of a vessel or sherd is something that the student soon learns to recognize once he becomes familiar with the other characteristics by which our ware can be recognized, it is less simple when we are faced with a substantial proportion of pottery in which the colour difference seems persistent, while the other characteristics of the ware remain ostensibly the same, for we do not yet know to what extent individual factories, or even individual potters, may have used variant materials or methods of firing that yielded consistently different results, while remaining in other respects within the 'black-burnished' tradition. We shall have to pose this question in connection with some of our material when we deal (p. 96) with certain wares that belong, or seem to belong, to neither of the two recognized categories of black-burnished ware.

[3] Conclusions reached by Thomas May (1916, 3-6, 154-5) require reconsideration.

It is necessary, however, to make it clear that we are not here referring to *wheel-thrown grey wares* reproducing the form and decoration as well as, to a greater or lesser extent, the surface finish of black-burnished cooking-pots, bowls and dishes. These wares, thought to have been made in 'many small kilns throughout the province', and often self-coloured in that the light or mid-grey colour of their surface is matched by that of the body, are classed as kitchen rather than table wares but said to be made of 'non-refractory' clay and intended for other purposes than cooking (Gillam, 1960-1, 127)[4]. Although the writer considers that there is a wide range of variation in the fabrics of these derivative grey wares, and that many of them are in fact of equally coarsely-gritted heat resistant material as the black cooking-pots, there is no more doubt that they were intended to be grey than that the others were intended to be black. Except in illustrations unaccompanied by sound descriptions they should not therefore be hard to distinguish from the black-burnished categories.

It remains to add one more to the general qualities characterizing black-burnished ware, the presence of non-plastic 'fillers'—the grits to which reference has just been made—consisting of ordinary sand (i.e. sub-angular or rounded grains of quartz) worked by the potter into the clay, and giving it a porous, relatively 'open' body capable of resisting the stresses of rapid heating in cooking, as well perhaps as making it less subject to waste in firing. It should be noted that these grits hardly protrude even in matt parts of the surface of black-burnished wares, presumably owing to minimal contraction of the clay body in drying and firing. The use of sand as a filler rather than of substances such as comminuted shell, limestone, or calcite, is not of course peculiar to black-burnished ware, but the consistency of its employment is one of a number of factors indicating the strength of the black-burnished ware tradition.

A rough and ready distinction between the proportion or the coarseness of sand used as filler has been drawn, as we shall see, and on the whole with justification, between the two major categories of black-burnished ware; the casual inclusion of small pebbles or lumps of other minerals as well as of quartz has not so far been thought significant. The diagnostic value, under the microscope, of the presence of very small quantities of 'heavy minerals', pointing to the source of the sand, is, however, dealt with elsewhere in this volume (pp. 63-5).

TECHNIQUES OF MANUFACTURE

We cannot properly approach the study of black-burnished ware, or indeed of any comparable industry, without giving some thought to basic processes of pottery-making, which the writer believes has, at least in respect of Iron Age and Romano-British wares, been neglected in favour of typological study and which, if given at all, has often tended to obscure certain aspects of the subject through its common use of inaccurate or misleading terminology[5].

By far the most important distinction lies between *hand-made* and *wheel-made* (or, more precisely, *wheel-thrown)* pottery, although this statement must not be taken to imply that both methods could not be employed by the same potter, even in building

[4] We seem to find examples of these, although originally listed under 'cooking-pots' and vessels 'in cooking-pot fabric', in Gillam's types 115-17, 218, 224 and 312, and doubtless will do so amongst others of the series 118-48 that he has not yet assigned, in the revised editions of his Types paper (Gillam, 1957), to either of his two black-burnished ware categories.

[5] For sound technological studies the reader is referred to Scott (1954), Hodges (1965), and Shepard (1968), with their bibliographies.

the same pot, as perhaps by the throwing of clay added in the form of rings or coils to a hand-made body, which might explain features displayed by vessels like the late calcite-gritted 'Huntcliff' jars of E. Yorkshire.

In the first of these basic processes—most obviously, for anything but the smallest vessels, by *ring-building* or *coil-building* (Hodges, 1965, 26-7)—the potter builds up the pot, welding together the rings or coils and perhaps drawing up and thinning the walls, with no power other than that of his own hands, aided by simple tools which may be natural in origin and seem rarely to have been specially made. In throwing, on the other hand, having centred a lump of clay on the wheel-head, he makes use of the centrifugal force imparted by rotation under sustained momentum at a speed of perhaps not much less than one revolution per second, guiding the clay into the desired shape with a containing hand as well as by manipulating and smoothing with fingers or tools.

If we leave aside, for the moment, any consideration of the signs by which the use of these two fundamentally different methods may be detected, it will be well to realize that in the hands of an experienced craftsman the hand-made vessel, although rarely if ever as sharp and precisely moulded in any particular as a wheel-thrown vessel, may be exceedingly regular, elaborate in design, and aesthetically pleasing. It need not be coarse, thick or clumsy, nor betray itself by obvious or readily separating coils. Had this been better appreciated, fewer students would have gone through life in the conviction that hand-made wares in Roman Britain were either a short-lived regional Iron Age hang-over or a sub-Roman degradation, or that they imply an unspecialized domestic rather than a professional or semi-professional industry.

One of the major obstacles in the way of a truer appreciation has been the belief of a device called a 'slow wheel', a free translation of the French *tournette,* which would be better rendered simply as *turn-table.* This has given rise to a concept, too vague for precise analysis, of some half-way house between hand-making and wheel-throwing, but inclining towards the latter, and certainly failing to recognize the essentially hand-built character of any ware that is not either thrown, or made in a mould.

A further source of confusion is the constant misuse of the term 'wheel-turned', whether applied to the supposed product of such a 'slow wheel' or—and there is often no clue to the intention—simply as a synonym for 'wheel-thrown'. We do not mean that 'wheel-turning' is not a perfectly valid term in ceramics, for indeed it is so when applied, exactly as it would be *mutatis mutandis* in turning articles of wood or metal on the lathe, to the process of trimming or paring off shavings of soft clay under rotation. The process was frequently employed in cutting horizontal grooves, in forming more elaborate rims or bases and in hollowing out the under-side of the latter, as well as presumably in thinning eggshell wares. Not all of this need or could have been done while the pot was still on the wheel after throwing, and still wet, but would have been performed at the leather-hard stage after re-centring on the wheel.

Since there is no reason why this process should not have been carried out on a hand-made vessel, supposing it was sufficiently regular to receive the steady pressure of a sharp tool without mishap, we need to be on our guard against an assumption that evidence of turning implies a wheel-thrown ware. Still more do we need to avoid drawing the same conclusion from any kind of evidence of rotation, for it is unlikely that even our more remote prehistoric potters were unaware of the advantages of some kind of turn-table, were it no more than a mat or a suitably shaped stone on which a vessel could be given an occasional turn without direct handling, at least to facilitate burnish or decoration, while the craftsman remained in a sitting or squatting posture. It is not a far cry from such a device to something specially designed, which might be

pivoted and capable of some degree of revolution under momentum—in other words, a true turn-table or *tournette*— on which a hand-made vessel might undergo some refinement of shape and be given some rotary decoration and burnish. Such indeed would seem the most likely explanation of those more than usually regular features of rim moulding or surface treatment that occur not infrequently in black-burnished ware of Gillam's Category 1, which otherwise shows none of the features specifically associated with wheel-thrown wares, and perhaps also to an extent in other wares, such as the Belgic, normally throught of as exclusively wheel-thrown. For the contemporary employment of such a technique, in an industry of which the possible further relevance is discussed below (p. 93) and for information about which the writer is entirely in debt to Mr. H. W. M. Hodges, we need only glance at the Turkish casserole (Plate IVc) hand-built from three coils but given a reeded rim on the turn-table with the help of a wet rag. Such vessels may well be described as wheel-finished, so long as this is not stressed at the expense of an appreciation of the basic technique.

In distinguishing wheel-thrown from hand-made wares, whether occasionally or habitually wheel-finished, we will be well advised to look first at vessels of relatively closed form, such as our cooking-pots, rather than at open forms in the same ware, because wheel-made bowls and dishes generally lack some of the more pronounced or decisive signs of throwing, owing to the smoothing or burnishing of the inside. On occasion it even seems to have been thought more convenient to hand-burnish their insides in whole or in part. The interior of vessels of more closed form, on the other hand, neither deserves nor facilitates such treatment and here, as in Plate IIB, fine or broad shallow rilling, grooving or ridging is almost always a marked feature, amounting frequently to pronounced horizontal or slightly cork-screwed corrugation, especially towards the base, which may itself display a distinct spiral. Such corrugation is not so often present externally except in such vessels as mortaria and flasks of white or red ware, although it does occur occasionally in our wares (Plate IIA).

The principal other clues to wheel-thrown vessels are their severe regularity of form, unless subsequently distorted, and a mechanical sharpness and precision (and, where appropriate, the intricacy) of such features as lip, neck and shoulder junction, carination, chamfer, foot, and of horizontal linear decoration, and of which some sign generally survives both wear and burial.[6] In wheel-thrown jars and necked vessels, too, the extent of wheel-burnish or smoothing on the inner face of the rim or neck is invariably much less, as well as more regular at its edge, than in the hand-made equivalent.

Since thrown vessels begin as firmly centred lumps of clay, the advantage if not the necessity of severing them from the wheel-head with the equivalent of a cheese-wire may result, under rotation, in the formation of a whorl or 'thumb-print' tangential to the edge of the base, but its absence, even where not obviously obliterated by hollowing out or by the addition of a foot-ring, is certainly not diagnostic of a hand-made ware.

Precision of surface finish in smoothing or in burnishing carried out at the leather-hard stage is also a factor in distinguishing a wheel-thrown ware and, as with many of the other factors enumerated above, such as the basal spiral and under-base whorl, is on occasion equally useful in the determination of bowls and dishes as of jars. It is, however, often less decisive in itself because it can be irregularly executed on the wheel

[6] It is unfortunate that such features in hand-made vessels are often sharpened in sectional illustration, and given unwarranted definition by a ruled horizontal line in the corresponding elevation side of the drawing, where a softer, freehand line or a shading would serve.

if the tool is applied carelessly or intermittently or at slow revolution; indeed, in the writer's experience of Romano-British kitchen wares, patchy burnish, in which streaks of the matt surface are missed, is more characteristic of wheel-burnish than of the hand, as on the inner face of a flanged bowl from Richborough (Plate VD, bottom right). Moreover, at less than its best, the surface treatment of a wheel-thrown vessel can be matched by a finish applied on a turn-table to a hand-made vessel, as we see with exceptional clarity in the perfectly preserved surface of a hand-made cooking-pot from the Redcliff factory near Wareham, Dorset (Plate IB). At its best, however, as when a burnished surface exhibits faint but entirely regular and continuous horizontal planes of pressure, or when such planes are absent and the surface wholly smooth and silky, we can reasonably assume a wheel-burnish at revolutions more appropriate to a wheel-thrown form.

CATEGORIES OF BLACK-BURNISHED WARE

Gillam's classic paper on the coarse pottery types of northern Britain (1957, 180-251) appeared before he was prepared to commit himself as to categories of black-burnished ware and consequently made no precise distinction between what were termed 'fumed' or 'cooking-pot' wares and comparable forms in grey or other fabrics. Although the two reissues, in preface (1968) or text (1970), did much to satisfy the need, some ambiguities remain, particularly as to those relevant forms not therein specified as belonging to one or other of the two black-burnished categories. Meanwhile the contribution to Dr. Steer's Mumrills report (Gillam, 1960-1) had appeared with its concept of two distinct categories, contrasting them with 'wheel-thrown grey wares', as well as illustrating several significant black-burnished types not recognized in 1957. These categories are now succinctly termed BB1 and BB2 and conveniently compared, in their second-century forms, in a paper in which their significance to outstanding problems of the occupation of the walls of Hadrian and Pius is considered (Gillam and Mann, 1970, 30-6).

An earlier contribution than any of these to the history and significance of these cooking wares in the North, as well as of other classes of vessel, and covering the whole of the occupation from Flavian times onwards, offered brief selections of principal types most characteristic of successive periods including examples recognizable as of BB1 and BB2, and is for that reason still capable of contributing something to the discussion, but more particularly because it remains, albeit in summary, the most comprehensive statement of the history of what we call the BB1 industry as formulated by Gillam and accepted at least up to March 1972 (Gillam, 1955, 65, 68, 73).

These papers contain practically all that has been said on the subject as a whole, apart of course from the primary sources of the material, with the exception of a short review of the problem by the present writer (Farrar, 1968, 174-6), and an important note (Peacock, 1967) on some preliminary scientific researches into the sources of the categories, which did not accord with all of the conclusions suggested as a result of scientific tests by different methods carried out by Mrs. Richards on sherds from Mumrills (Gillam, 1960-1, 127-30).

There is much to be said for concise definitions, and the writer proposes to meet this need by attempting in due course to summarize the main characteristics of the fabrics of BB1 and BB2. In his opinion, however, fuller discussion introducing detail much of which may seem trivial, cannot be forever avoided if we are to extract from the material as much knowledge as we can of the industrial processes, and it seems to him most of all in the minor oddities of practice that we may learn to distinguish between

superficially similar industries, or perhaps between different centres of production in the same industry.

Category 1

Form. The sources quoted above must serve as our main guide to the range and development of those forms of black-burnished ware that were widespread in Britain between the second and fourth centuries. In supplement, attention may be directed firstly to the usual, necked form of BB1 cooking-pot as in the Dorchester examples in the County Museum shown in Fig. 1, no. 1 (1886.9.47) and Plate IIIA (Colliton Park Garden Pit 1). The variety of rim form is such that even a liberal selection, such as Gillam's types 119-30, 145-8, should be regarded as a guide rather than a rigid classification;[7] so much do they merge that were each to have had a separate place in a chronological sequence they might be regarded in much the same light as a selection of cinematic 'stills'. Despite this lack of standardization there is a common factor in that there is almost always to be seen in the outer profile of these rims an element of straightness or angularity, or a bulge or other interruption in the smooth line of the curve, especially at the lip which is very often beaded. None of these rims, except by rare chance, exactly matches either of the two standardized forms we meet in BB2.

The profile of the handled beaker, with its bead-rim or short upright rim, is represented more typically by Mumrills no. 1 (Gillam, 1960-1) than by his type 64, of which his type specimen, from Birdoswald, is in the writer's opinion a wheel-thrown grey ware. Flat or 'pie-dish' rims in bowls and dishes (e.g. Gillam's type 219), and their subsequent incipient or fully flanged forms (types 226-8), are proper to BB1, and not to BB2. The flanged rim does occur in dishes (Charlesworth, 1967, no. 20). Both the plain and the beaded or grooved rim are common in the dish class, as such types as Gillam's 329 and 316 show, but rare in the bowls; indeed the plain form seems altogether lacking in the bowl class, and we have to look to Mumrills nos. 20-3 (Gillam, 1960-1) for illustration of the beaded version. The groove is deep and the bead well formed. Examples ostensibly of the plain dish 329 and with its usual arc decoration as well as its rarer lattice, but with a slight constriction below the lip forming a vestigial bead, are far more common in the north than the sole illustration (Mumrills, no. 28) implies.

A slightly sagging base is normal in the plain dish type 329 and may be present in the 'pie-dishes', 306-08; only rarely does a chamfer appear in these dishes. The later 'conical' bowls, types 227-8, invariably have flat bases, but the flat base with chamfer is not so constant a feature of the bowls with 'pie-dish' rim, 219-21, as is suggested, and is not proved for those with beaded rim. The chamfer may be replaced by a rounding, or the base may merely sag. Rising or 'dished' bases are not a feature save in cases of exceptional distortion, although the essentially flat bases of cooking-pots may rise or sag a little.

The makers of similar classes in grey wares or in less common black-burnished fabrics seem in the main to have followed BB1 rather than BB2 in details of rim form.

Fabric. The typical BB1 fabric is of 'open' texture, coarsely and heavily gritted with quartz sand, although examples occur with finer or more moderate gritting; it is fairly hard but rather rough in fracture, and the colour is essentially black or dark grey throughout, although a very thin reddish, brownish or brownish-grey layer is common immediately under the black surfaces and sometimes thick enough to leave only a black core.

[7] Reference to Gillam's types, where otherwise unqualified, is throughout to his Types paper (1957) or its editions of 1968 and 1970 with modified text.

All types are hand-made and never display the corrugations or other features of wheel-thrown wares described above, but the frequent use of a turn-table is implied by the relative precision of rims and sometimes in the surface finish.

Finish. In general the burnish is shiny, and worked by hand, showing the marks or 'facets' of short individual strokes, in a roughly horizontal plane except beside such features as handles (Plate VD, bottom left, Birdoswald); on basal surfaces of bowls and dishes it tends to run transversely in one or more directions although at their margins it tends to follow the curve. Occasionally, the burnish marks are sufficiently regular and continuous to imply work on the turn-table (Plate IB). Surfaces intended to be burnished are fully covered.

In the cooking-pots (e.g. Fig. 1, nos. 1, 4) the inner face of the rim is always burnished as far down as the junction of the neck and shoulder and occasionally a little further, often with an irregular burred edge; treatment of its outer face is inconsistent but frequently governed by accessibility. On the body the central zone reserved for the scribed pattern is almost invariably untreated in any way, but while the shoulder is burnished in the normal fashion, the lower body and under-base frequently display an inferior burnish, hardly more than a smoothing although generally with a certain shine. Although this occurs in earlier forms it is especially characteristic of the late types, like Gillam's 146-8, where this lower zone, though still shiny, may often be covered with fine horizontal scratches resembling stiff brush-marks and too consistent to be explained as the result of the dragging of grits. An example from the potters' field at Stoborough, in the Dorset County Museum (1957.24.2), shows this treatment (Plate IA). This vigorous rotary finish may have had the effect of thinning the wall slightly, because there is usually in these examples the slightest of breaks in the even profile at the lower edge of the central matt zone.

The matt inner face of the cooking-pot may show finger-dimples, and in some cases there is evidence for a kind of 'fettling', perhaps brushing or wiping out with a rag, in the form of light roughly horizontal striations, which may, at least in the same late types, be very strongly marked, as in Plate IIIB, from Corbridge and Dorchester (lower sherd).

The bowls and dishes have been said to be burnished all over, but the under-bases may be left matt while both these and the outer walls usually show the same poorer burnish that we see on the lower bodies of the cooking-pots, and which may also be scratchy in the later conical bowls. There is no provision of a matt surface for decoration as in the cooking-pots.

Although little can safely be said of it at present there is no doubt that on occasion some kind of slip was applied to BB1 vessels, or a wet-hand or 'slurry' finish (Hodges, 1965, 33), presumably in the belief that it would yield better results on burnishing. Instances where drips can be seen are, however, so rare as to suggest that dipping the vessel in a bowl of slip was not the usual method. It is more likely that the area concerned was worked over with a wet hand or cloth to bring up some of the clay fraction from the body, so producing what has sometimes been called a self-slip. This will be very difficult to detect, owing to subsequent burnish, since the latter's less porous surface, by inhibiting the burning out of carbon during firing, will itself generally give a richer black effect than appears in unburnished areas, and could be expected to produce an appropriate colour contrast of some degree under oxidizing conditions as well.

The clearest example of a process of this kind is a late cooking-pot with oxidized surfaces from the Redcliff factory, near Wareham (Plate IVA). Here the creamy colour

of the burnished rim and shoulder contrasts with the reddish-brown of the unburnished latticed zone. This in itself need signify no more than an effect like that just described, but a narrow patchy fringe of clay wash, which is still creamy in colour despite being as matt as the rest of the unburnished area, has escaped the attention of the burnisher, betraying the fact that something was done to the surface beforehand. Mr. Hodges has kindly examined the sherds and suggests that we have a slip of different clay from that of the body, and failing to match it properly, as a result of which the surface is crazed; but the writer would nevertheless suggest, in view of the patchy or pasted appearance of the creamy fringe, that it was worked onto the surface with the hand, or with a cloth or brush. The lower body, not here illustrated, was not so treated.

That BB1 clays readily take an equally high burnish without such assistance is clear when we observe that although the pencilling of the patterns, with some kind of blunt-point or thin smooth edge, is done with single strokes that are not worked over, the lines are just as shiny and dark as the best burnish of the body itself, and the grits just as effectively concealed, even though, in the cooking-pots, they are drawn on a wholly unsmoothed matt surface which must inevitably betray something of the granular nature of the sandy clay body (Plate IB). This also suggests that a tool of much the same sort was used for both purposes.

In the Redcliff cooking-pot described, the shiny lattice strokes match the body colour and not the cream of the burnished rim and shoulder, a contrast that in less fortunate circumstances could alone have betrayed the special character of the finish.

Decoration. The decoration of the cooking-pots almost always takes the form of a broad zone of acute-angled lattice, giving way to a narrow zone of obtuse-angled lattice; the date, *c.* A.D. 250, commonly suggested for this change seems fair, although the rather free or careless execution that tends to mark off BB1 from its main rival occasionally allows obtuse angles to intrude into part of an early scheme. Bearing in mind the curvature of the vessel it is obvious that the long strokes necessary in the earlier scheme invite more nearly vertical treatment; although more slanting strokes are only simplified rather than invited by the change to the narrow zone, they were invariably employed by the later potters.

Although the lattice treatment of bowls and dishes only survived long enough to appear on the transitional form (Gillam's type 226) heralding the emergence of the flanged rim with its pattern of intersecting arcs, two points must be noticed; the potters of the earlier forms of bowl and dish not infrequently took advantage of the licence afforded by the relatively low walls of these classes to draw more oblique lines, producing obtuse-angled or right-angled lattice, and they also anticipated in a sense the arcs of their successors in that the lattice on these forms often consists of steep arcs or chevrons, although these may have their apices suppressed by the under-rim burnish, as in an unprovenanced bowl in the Dorset County Museum (Fig. 1, no. 8; 0.147.1). The explanation doubtless lies in the convenience of drawing a succession of separate, intersecting, angled strokes, rather than to work round the vessel twice with separate sets of parallel lines, as seems to have been the practice with the already sufficiently long strokes of cooking-pot lattice, as well in the later as in the earlier scheme.

The points of origin and the sequence of strokes can often be detected in pressure points and at the intersections, and it may be possible to suggest how a vessel was positioned for the process (Farrar, 1968, 180),[8] but it would be wise to defer consideration

[8] It should be noticed that the report stated in error that the sides of the bowl under discussion therein were decorated before the base.

of such potentially diagnostic features until such time as detailed studies of centres of production are undertaken. It is worth noting, however, that the cooking-pots do not seem to have been inverted for decoration, although most probably removed from the turntable, and in any event had their strokes drawn from shoulder towards the base, and frequently tailing off raggedly beyond the lower margin of the matt zone, as we see in a late example from Glyde Path Hill, Dorchester (Fig. 1, no. 4; Dorset County Museum, 1886.9.15). The fact that this overrun lies on top of the burnish of the lower body in those instances where this burnish is, as described above, of poorer quality than that of the shoulder, whereas the latter usually cuts off the upper margin of the decoration, shows that in these cases, principally amongst the later vessels, the order of treatment was (1) lower body, (2) decoration, and (3) shoulder and rim. Whether the shoulder was first treated like the lower body, so as to reserve the area for decoration, is not apparent, but the sequence draws attention to the functionless nature of the girth line, always scribed after completing the burnish, that usually marks the top of the narrow zone of decoration in the late cooking-pots, although not often appearing in the earlier forms, or at the lower edge.[9]

Departure from the simple lattice scheme is unusual, in any class of vessel where we would expect it, in the developed industry, and tends to take the form of the omission of one set of parallels, or the substitution of a more widely spaced scheme of multilinear lattice as is much more common in BB2, and which in BB1 is perhaps largely confined to large jars. A herring-bone pattern in place of an obtuse-angled lattice will, however, be mentioned when sources are considered (p. 93). The wavy or zig-zag pattern common on cooking-pot necks and not believed, unless freakishly, to outlast the second century, must inevitably have been copied occasionally in other fabrics but is not reliably attested in BB2. The back-handed streaks often to be seen on sherds of the more sharply everted, matt or incompletely burnished necks of late cooking-pots, as a result of burnishing the shoulder, should not be mistaken for decoration of this kind.

Other patterns, equally lacking in BB2, are common on the under-bases of bowls and dishes (excluding the chamfer, whether burnished or not) in all types during our period, as in Fig. 1, no. 8; they are almost always curvilinear and probably classifiable, and could conceivably be diagnostic of particular centres, but they are rarely illustrated. They cannot be considered here, but attention will be drawn (p. 90) to the much rarer decoration of the upper face of some dish bases. Decoration of the inner walls, such as occurs in late flanged-rim bowls like Gillam's types 231-2 in some other industries, is, however, unknown.

Category 2

BB2 shapes are comparatively few and standardized in detail, and in its northern area of distribution there seems to be no difficulty in distinguishing the ware from the accompanying mass of BB1 and other wares of the same general form and decoration. It is otherwise in S.E. England where, from the writer's less thorough search, the material, though considerable in total bulk, is widely and relatively thinly distributed, and appears to lack some of the homogeneity of the northern finds, as well as being almost totally unnoticed in the literature as a ware distinct in any way from other latticed wares of the sort. It will be more appropriate to touch on the problems of attribution in the South-East when we come to deal with sources, in our final section, but by way of illustration it will be convenient to dispose now of one such problem,

[9] A lower line defining the matt zone is, however, illustrated on late types imitating if not actually of BB1, at Fishbourne (Cunliffe, 1971, types 328-30).

which may be thought, at least where the whole form of the vessel is known, to be capable of simple solution. This type, marked out as a jar or vase rather than a cooking-pot, although sometimes by no great margin, by its relatively narrow base, slender and often slightly concave foot, appears often, in examples seen by the writer in Colchester and the Guildhall Museum, London, to be a disturbingly close match in every other respect for cooking-pots of BB2, although often displaying variant schemes of decoration, rather than the simple lattice. Such jars are figured, for example, from Colchester, London, Lullingstone and Ospringe (May, 1930, pl. lxxxiv, grave 77; R.C.H.M., 1928, fig. 64, no. 18, fig. 65, no. 29; Meates, 1955, pl. 22; Whiting, Hawley and May, 1931, pl. ii, no. 10, pl. xxx, no. 300). The shape would thus seem to disqualify it as 'black-burnished ware' in our sense, but an alternative view, to which the writer inclines, could see it as a variant class of BB2, which may yet be shown to issue from the same workshops, in the same way as regional classes of BB1.

Form. For BB2 types we again have the incomplete pre-Mumrills series in the Types paper (Gillam, 1957), glossed as to category in the two reprints, together with his collection of the second-century types (Gillam and Mann, 1970, fig. 2), realistic in its representation of slightly sagging bowl and dish bases and giving us, in its no. 15, a more ideal version of the cavetto-rim cooking-pot than the former gives in type 139. Gillam and Mann furnish us with a complete series, less the plain-rimmed bowl recorded at Mumrills (Gillam, 1960-1) no. 45) and, of course, lacking the third-century bowl and dish types 225 and 313. There is some ambiguity about the grooved-rim bowl type 234, apparently dropped from the category in the 1970 edition, although Gillam and Mann's no. 19 (from the Mumrills series) may be thought to fill the gap. No source has yet thrown light on the attribution of the 'miniatures', types 170-2. A more serious question-mark attaches to the cooking-pot types 138, 143 and 144, but consideration of these is best postponed until we have discussed the class.

The bowl and dish classes, important as they are—and Gillam has observed that they are generally more common than the accompanying cooking-pots—need not detain us long. Those that share the plain or the grooved rim with BB1 and other coarse ware bowls and dishes, depend for recognition on the distinctiveness of their fabric and finish, and to an extent in the persistence of the small basal chamfer, which is not a very common feature of the bowl and dish classes in other fabrics on the northern military sites, although the writer has seen it in a wheel-thrown grey dish with flat or 'pie-dish' rim from Corbridge. The chamfer is not always as distinct as it is represented, and in the grooved rim the groove may be either a fine incision or a broad shallow cut. The bowls and dishes with downbent or 'triangular' rims (e.g. types 222, 310) and their rounded-rim successors (225, 313) are in somewhat better case, since amongst wares of comparable type in the North these rim forms really do seem peculiar to BB2, or at least to vessels conforming closely enough not to demand some fresh classification. It would be foolish, however, to apply the foregoing generalizations to such features amongst the multiplicity of wares in the South.

The sharpness or triangularity of rim in Mumrills nos. 39 and 42 is exaggerated, but both this form and the rounded rim may occasionally be found projecting more generously in a manner recalling the 'pie-dish' rims of BB1, while a tendency to concavity in the inner wall immediately below the lip, as in Mumrills no. 40, is rather more common.

Besides the less usual bead-rim cooking-pot (Gillam and Mann, no. 14) of which a distinctive feature is the thickened section and rather sharp inner angle of the rim, our

characteristic forms in BB2 are the cavetto-rim (no. 15) and the straight-everted rim (no. 16), of which the cavetto is much the more common. While both these are highly standardized, the straight form tends to show an almost imperceptible curvature in the neck, which is answered a little more strongly in its inner face, while the cavetto frequently fails, as in Gillam's type specimen 139, to complete the full quarter-round proper to the hollow architectural moulding from which the name is borrowed. With this minor qualification, it is necessary to insist upon strict adherence to the proper use of the term *cavetto,* not only because it is frequently used so loosely as to deprive it of useful meaning, and none the less in works of high scholarship, but because failure to apply it properly obscures an essential difference, between the true cavetto and its approximations in vessels of comparable form, that to a very great extent is matched by differences in the wares. Providing it is understood that we do not expect the kind of precision, in coarse pottery, that might be achieved by the use of a template, or deny that apprentice work might sometimes be put on the market, we shall find that curved rims of latticed jars that do not conform to the true cavetto will include no examples of BB2, while those that do will include little else.

A cavetto rim is one that turns out abruptly from the shoulder as a true arc not exceeding a quarter-circle, unbroken by any deflection, straightening, or other interruption in the curve from shoulder to lip. It excludes, for example, otherwise consistent types in which a distinct lip is formed either by a slight horizontal spreading at the tip or by a lip-beading. Unless the quarter-round is taken to its fullest extent short of commencing a downward curve, and perhaps not even then, there is no distinct underside to the lip such as would call for illustration, in the elevation half of a drawing, as a second horizontal line parallel with and immediately below that representing the top of the rim *(cf:* for instance Fig. 1, nos. 2 and 3 with nos. 1 and 4).

On the face of it, Gillam's lip-beaded type 138, defined as BB2, seems to deny this principle at the outset; in fact, it does not, for examination at Corbridge shows that the type specimen, at least, falls into a different class altogether, as a facet-burnished grey ware of a sort we shall need to consider later (p. 96) in connection with BB1 rather than with BB2. Exactly the same can be said, following examination at Edinburgh, of Mumrills no. 33, and doubtless therefore of its pair, no. 34, both assigned to BB2, but both more or less angled at the lip and both scribed with a wavy line on the neck (Gillam, 1960-1) fig. 12, 118, 127-8).

We can also now consider Gillam's types 143-4, both with true cavetto rim but not assigned to BB2. The omission of type 143 may be considered unintentional, because a review of the dated groups cited, and examination of some of the sherds, show that this is simply type 139 but with the cavetto rim in its ceramically most perfect, quarter-round form—indeed, we have already noted its selection as the principal BB2 cooking-pot in the Gillam and Mann series (1970, no. 15). What remains anomalous, *vis à vis* the rest of BB2, is the suggested dating of *c.* A.D. 180-280, for while the earlier limit may stand pending ultimate agreement as to the date of the second Antonine occupation of Scotland, it seems improbable that the type would alone have survived its fellows in the North by some 30 years, and the evidence that it did so is not substantial. Since we have drawn attention to the type, we cannot leave it without noticing that while Gillam has observed more than once that the fully developed cavetto was prevalent in the third century (e.g. Wright and Gillam, 1953, 118), distinction between it and the rim of type 139 is often subjective and, at its best, admissible, as he has said, only in bulk as a guide in assessing the bias of a group of pottery towards the second or the third century, and not in the dating of the individual vessel.

Type 144, dated on the frontier from A.D. 200 to 280 on much the same grounds, has been allowed a lower limit of A.D. 160 farther south in the military zone (Gillam, 1957, 2nd edn., preface); consideration of the type will involve some reassessment of the evidence on which this view is based. The type is of considerable importance in the study of BB2, and will be found inseparable from any review of its sources. It must first be explained that the reconstruction of the type specimen, one of two from Bainbridge in northern Yorkshire, is misleading in that the scribed decoration is an 'open' or widely spaced multilinear lattice, not a series of crosses. Only one dated parallel is listed, from Bewcastle, but this shows that another scheme of decoration consisting of roughly vertical lines in spaced groups, is comprehended in the type; Gillam figures this variety elsewhere, in a very select list of third-century coarse ware forms in the North (1955, 71).

Gillam found no examples of type 144 amongst the several hundred cooking-pot rims from second-century levels at Corbridge, and despite the chance of such decoration being unrecognizable or absent in sherds retaining little of the decorated zone, there must be general agreement with his estimate of the date of its appearance in the region of the Wall, although it does not seem to be so rare there as was suggested, especially in comparison with northern Yorkshire. Since Gillam's list of dated groups was prepared, single examples have been published from Aldborough (Jones, 1971, no. 1) and Turret 51b (Woodfield, 1965, no. 31), and there is another from Old Durham (Wright and Gillam, 1953, no. 1). Like Bainbridge and Bewcastle, these include examples of both variant schemes, paired indiscriminately with cavetto rims of both orders shown in types 139 and 143, i.e. 'typologically' second- and third-century forms—with the proviso, for Bewcastle, that one accepts the pot as 'black-burnished ware' at all (Hodgson and Richmond, 1938, no. 2). The others appear satisfactory, but this is surely not the case with the five examples from earlier work at Aldborough, and it is upon the group associations of the last two of these that the concession of an earlier date and the implication, perhaps, of an origin in Yorkshire, have been based (Myres, Steer, and Chitty, 1959, 36, 67-8; fig. 11, nos. 27-8, 34; fig. 24, nos. 16, 20). Type 144 has no monopoly of these patterns, even amongst black or black-burnished wares, and they can be found readily in southern as well as northern sites, and perhaps at much earlier dates in the former; we shall, therefore, need more precise correlations of form and ware if we are to trace type 144 to its source.

Examination of unpublished examples of type 144, besides yielding the surprising result that perhaps three, out of the only four complete or restored cavetto-rim cooking-pots that the writer has yet succeeded in finding in the North, belong to it, shows that it is otherwise indistinguishable from BB2. It can therefore neither be ignored nor placed in any other category, no matter how special a source or date may ultimately be found for it. One of these vessels, with grouped verticals, is in the museum at Corbridge; the others are from South Shields, one with multilinear lattice in the Museum of Antiquities, Newcastle (1956.128.126 A), and the second, with grouped verticals, and containing cremated bones, in the South Shields museum together with a substantial part of the base of a third, but in a sealed case and not closely examined. A much less than exhaustive survey of the sherds stored at Corbridge revealed three more rims with remains of the pattern of grouped verticals, two with the 'early' and one with the 'late' cavetto, while in the National Museum at Edinburgh, an 'early' cavetto from Ardoch, though worn, seems to have the multilinear lattice.

Fabric. In first making the distinction between black-burnished ware of Categories 1

and 2 at Mumrills (1960-1, 126-7), and in his view most obviously on details of form, Gillam stated that 'black-burnished cooking-pots were . . . hand-made and do not display the internal rilling of wheel-made vessels'; no distinction in this respect was made between the categories, nor was it wholly clear whether it applied also to the bowls and dishes. We have already discussed the differences between hand-made and wheel-thrown wares, and if we apply these criteria we will find no need to differentiate between the bowls and dishes and the cooking-pots, and we will see at once that BB2 is a wheel-made ware. All the usual signs of throwing are present in the cooking-pots, except detachment whorls in those very few cases where northern museums have preserved base fragments, although their absence in bowls and dishes tends to confirm it. Cooking-pot rims do not, of course, always retain enough of the body to show the internal corrugations, which are stronger lower down, but there are usually traces of fast rotation on the inner face of the shoulder and, as is evident in Plate VB, a regular and distinct bend in this face where the curve of the wall meets the contrary curve at the base of the neck. Enough remains of Mumrills no. 37, however, to show clear corrugation, and so also, for example, do nos. 21 and 34 in the Corbridge 'destruction deposit' (Richmond and Gillam, 1950, fig. 7), but the one substantially complete northern example of type 139, in Edinburgh, from the earlier excavations at Mumrills by C. W. Forbes and hitherto unpublished, makes it plain (Plate II; Fig. 1, no. 3).

BB2, although also an open-bodied ware, has as a rule a closer, less obviously sandy body than BB1, with a cleaner or less 'granular' fracture, although we must insist that exceptions are not unusual in both categories; it is not clear whether this is due to the use of finer sand or a smaller proportion in the mix. The ware is characteristically dark-faced on a medium-grey body, rather than essentially black throughout as in BB1, but the usual thin, brownish, presumably oxidizing layer immediately under the surfaces and giving rise to Gillam's term 'laminated fabric' (Gillam and Mann, 1970, 30), is only diagnostic in being even more common and usually more distinct than in BB1 ; its significance in terms of firing conditions has never been put to the test. The difficulty of defining a characteristic surface colour is reflected in a certain element of variety in our sources, but black to medium grey or greyish-brown is the briefest useful description, quite commonly with a silvery or a 'purple' or 'pink' tinge in the grey which may be connected with a special finish discussed below. As in other wares, the surface colour or depth of shade is influenced during firing by the presence or absence of burnish.

Finish. The burnished surfaces of BB2 vessels are silky to the touch, being either completely smooth, or linear—burnished-that is to say, lightly and regularly marked with horizontal planes of pressure especially on inner faces. This silky texture owes nothing to a less gritty clay, and is due to the careful treatment on the wheel, at the leather-hard stage, presumably with some other part of the tool than that used for decoration, or with a different agent altogether. Occasionally, however, the inner face of a bowl or dish is given a hand-burnish producing the same faceted surface as in BB1, horizontally in the sides and for the most part transversely across the base. Burnished areas are treated consistently and do not, either intentionally or unintentionally, display missed streaks of matt surface as do some other wheel-burnished wares (Plate VD, top left, Colchester), except to some slight extent in sharp angles between the neck and shoulder of cooking-pots or in the rim angle of bowls and dishes. Failure to burnish the neck, as in the wheel-thrown black-burnished ware rim from Corbridge shown at top right in the same plate, is sufficient by itself to imply a non-BB2 fabric. The bowls and dishes, whether decorated or not, have an overall burnish except that the under-side of

the base may be left matt. The very scanty evidence available in the North suggests that the burnish of the lower body of the cooking-pots is not obviously inferior to that of the shoulder, with a rotary trimming of the under-base—which may be slightly dished (Fig. 1, no. 3)—leaving concentric tool-marking. Above the neatly defined decorated zone of the cooking-pots the burnish is continuous, ending, with the same precision, at a point on the inner face of the rim within a short distance of the tip (Plate VD, centre right, Corbridge); very rarely does it approach the half-way mark as it often does in other wheel-thrown cooking-pots and jars.

It is clear that BB2 vessels, at least the cooking-pots, were often treated with a true slip, although the reason for it is no more clear than in the case of the rarer slip or allied treatment described for BB1. Something of the sort has been noted by Gillam at Bainbridge on the type specimen of his type 144 discussed above (Wade, 1950, 15-16, fig. 4, no. 6), and by Brenda Swinbank at Benwell (1955, 150) on 'an unusually large number of cooking-pots, bowls and dishes', although the writer has not observed the streaky finish indicative of application with a brush, of which she speaks, or seen indisputable signs on bowls or dishes. His own conclusion, based, to name only northern sites, on examples from Corbridge, Carrawburgh, Haltonchesters, Mumrills, Rough Castle, Croy Hill and Ardoch, was that the pot was dipped to the shoulder and stood to dry before burnishing; it may betray the nature of the finish by drips visible below the edge of the burnished zone, or by a 'tide-mark' or drips on the inner face of the rim where the burnish, as we have explained, is of a marginal nature (Plate IIA and Fig. 1, nos. 3 and 5). The evidence for this treatment is common enough, but we cannot go so far at present as to suggest that it was the rule.

In some cases, the slip has fired black or grey as in a Corbridge rim in Plate VB (bottom right); in others, however, it shares the purple or silvery tinge that has already been noticed on the burnished surfaces of BB2 vessels, and the unburnished drips and 'tide-marks' suggest, by their contrast in colour with the rest of the unburnished surface, that the tinge, in these instances at least, is due to the special quality of a slip and not to the influence that burnish alone may have upon colour in firing. Since purple and silvery effects are equally frequent in the bowls and dishes, we must bear in mind the possibility that these vessels were slipped by total immersion, following which the overall burnish would leave few if any traces of the process.

The existence of this slip-coating can be demonstrated in all the everted-rim types of BB2 cooking-pot, 137, 139 and 143-4, and also in the rarer bead-rim, as in a Mumrills example (Edinburgh, FRB 698). There are a few cases, however, as at Ardoch, Rough Castle and Corbridge (Plate VB), where the slip is off-white or yellowish in almost violent contrast with the rest of the surface, and in nearly all of these there is sufficient variation from the norm in the colour of the clay body, exhibiting a light or putty-coloured grey core, as to suggest that this extreme may prove to be diagnostic of a particular centre or centres of production. Curiously, our only nearly complete northern example of a BB2 cooking-pot with the normal form of lattice, although with a considerably deteriorated surface, appears to be of this kind (Plate II and Fig, 1, no. 3).

Decoration. Scribed lattice patterns on BB2 vessels are generally executed more neatly and often with a closer mesh than in BB1, and over-running of the matt zone in cooking-pots, necessarily judged from southern examples, is infrequent although a ghost may sometimes remain beneath the burnish; girth lines circumscribing or superimposed on the lattice are not attested in the North, although they may demand recognition as perhaps local variants in the South. We have already noticed the two variant

schemes in Gillam's type 144; another consisting of equidistant vertical lines, instead of groups, appears at least in the South (Plate IIID, London; Guildhall Mus., 21996). As in BB1, bowls and dishes are not always decorated, especially in the later forms, but unlike BB1, they never display basal decoration, even on the under-face; decoration on the sides takes the form of lattice, oblique or near vertical lines, and single or multiple wavy lines. The wavy line seen often in the necks of BB1 cooking-pots does not seem to occur at all; nor do the BB2 cooking-pots develop narrow zones of obtuse-angled lattice. The intersecting arcs of BB1 bowls and dishes are not matched in BB2, although wavy lines may interlace.

Summary definitions of ware

BB1. Hand-made, coarse sandy black or dark grey ware, often with a brown oxidized layer below one or both faces, and usually showing signs of rotary finish but never the internal corrugation of wheel-thrown wares or a detachment whorl under the base. Hand-burnish, often superior on rim and shoulder of cooking-pots and interior of bowls and dishes, displaying facets of individual strokes; inner-rim burnish of cooking-pots always down to neck and shoulder junction. Scribed decoration usually careless, and especially in later cooking-pots often overrunning the lower edge of the central matt zone; the more individual elements are a wavy line common on the neck in earlier cooking-pots, narrow zones of obtuse-angled lattice in the later, intersecting arcs in the later bowls and dishes, and decoration on their bases at all periods. Some evidence for occasional slip or slurry finish of cooking-pots before burnishing, and, especially in later cooking-pots, for an interior fettling involving coarse horizontal striation.

BB2. Wheel-thrown, moderately coarse sandy dark-faced ware, with medium grey core sandwiched between brown oxidized layers; surfaces black, grey, or greyish-brown, often with silvery or 'purple' tinge to the grey. Silky wheel-burnish of even quality throughout, except where occasionally faceted in bowl and dish interiors; on the inner rim of cooking-pots, it is always confined to the lip margin. Evidence for common application of a slip, normally self-coloured, to the rim and shoulder of the cooking-pots, less certain for bowls and dishes. Scribed decoration neater, with lattices of closer mesh; the only individual element is the wavy line on bowls and dishes, but more use is made of vertical lines or more open schemes consisting of spaced groups of lines, while rims and bases are never decorated.

Other black-burnished wares

The attention lately paid to our two categories of black-burnished ware ought not to blind us to the existence of other wares sharing the tradition, and which may appropriately be described as hand-made or wheel-thrown black-burnished wares[10]. Like the grey wares, these seem likely to prove too heterogeneous and regional in character to form distinct categories, and they may prove to represent the sporadic output of small kilns, or subsidiary lines in larger centres like Alice Holt or the New Forest. They are, nevertheless, important to our present study in that they obtrude, as far as the writer can judge, into practically every collection in which our wares substan-

[10] The term 'burnished black ware' proposed for such wares in the discussion of a wheel-thrown series at Brixworth (Woods, 1970, 11) in order to avoid confusion with the hand-made or wheel-finished 'black-burnished ware' of the northern military sites, ceases to be apt when it is recognized that one of the two categories into which the latter has been subdivided is also wheel thrown; it may also be thought preferable to allow a distinction in terms to coincide with a distinction between burnished black wares in the 'black-burnished' tradition, and burnished black wares in altogether different or bastard traditions.

tially figure, not excluding the classic sites of the Roman frontier, like Balmuildy, Mumrills, Carrawburgh and Corbridge. Their character prevents us offering definitions like those of BB1 and 2; it is enough that they should be black and burnished and firmly within our tradition, but fitting into neither category. Mumrills no. 16 (Gillam, 1960-1) is an example, BB1 in shape and looseness of decoration, but wheel-thrown and with a deliberate matt band between rim and lattice pattern that is wholly foreign to BB1 or 2. Since it seems that nearly all of these wares will prove to be wheel-thrown, the main questions to be asked in examination of black-burnished types will be whether their characteristics of form contrast with the stylized detail of BB2, and whether their manufacturing and finishing techniques contrast with those we have seen to be so highly idiosyncratic in BB1.

Hundreds of examples are published without distinction in a literature that has only begun to appreciate a significant difference between BB1 and BB2. Those at Brixworth to which footnote 10 refers are amongst the first to be publicly recognized. Some of them may have come from kilns at Ecton (Woods, 1967, 17, no. 32), but types of broadly similar form recognized by Johnston there and at the Mears Ashby kiln site (1969, nos. 42, 44-8) are probably to be classed as wheel-thrown grey wares, although 44 and 47 are 'fumed'. Perhaps in this class too, but of some importance in tracing the agency and chronology of the spread of BB1, since they derive their inspiration from it, are the wheel-thrown cooking-pots, some of them latticed, from kilns near the fort of Little Chester, Derby (Brassington, 1971, nos. 132-6). If the Trajanic date proposed for them, and for accompanying vessels (nos. 129-31) recognized as of non-local origin, and likely to belong to BB1, is correct, it would be perhaps the earliest we have for the northward spread of Category 1 beyond the early operational area of Leg. II *Augusta.* Certainly most of the black-burnished sherds illustrated in such unusual and revealing detail from unstratified contexts at Little Chester, on a previous occasion, belong to BB1 (Brassington, 1967, figs. 6, 7 and 9).

Hand-made black-burnished wares that are not of BB1 fabric do exist, but are not so easy to point out; a few have caught the writer's attention from Rudchester, Col-Chester and Richborough. The dishes from the Malvern region of Worcestershire studied by Peacock plainly derive from the black-burnished, but they are bastard types with a fabric of Malvernian Iron Age origin (1965-7, fig. 1), and the writer would not like to commit himself as to the basic technique of the dishes, flanged bowls and latticed cooking-pots that he has seen from Clanacombe, Devon (Greene, 1970), though they are at least wheel-finished, and, as sherds, not very easy to distinguish from BB1 except for the black mica conspicuous in the grit.

The uncategorized black-burnished wares as a whole are effectively illustrated by two cooking-pot rims from London (Plate IVB). The smaller piece, with early short upright neck and rivalling BB1 in its coarse sandy body, is the Guildhall's classic example, in two joining sherds, of a black slip firing cream in oxidation, and is technically illuminating in other ways we cannot consider now; what concerns us is its conformity in detail with BB1, even to the wavy line on the neck, except in the vital respect of its being wheel-thrown and wheel-burnished. As in the wheel-thrown grey wares, we do not seem to have nearly as much evidence, particularly in the cooking-pots, for wares of this kind observing BB2 standards of form.

The larger rim and shoulder is equally exact in following BB1 specifications, this time in the later third- or fourth-century form with obtuse-angled lattice, although here very regularly scribed, and defined by a girth line the precision of which is understood when the sherd is turned over to reveal unmistakable signs of wheel-throwing. The

sandy fabric is unusually hard for cooking-pot ware and has some surface irridescence. Neither rim is burnished inside as far down as the junction of the neck and shoulder.

THE ORIGIN AND SOURCES OF BLACK-BURNISHED WARE

Category 1

Origin. The evidence for the Iron Age Durotrigian ancestry of the latticed cooking-pot with upright or slightly everted rim (Gillam's types 119, 122, etc.), and of the bead-rim version, too (type 118), has become more than ever explicit with the publication of the Tollard Royal series with its relatively generous display of matt zones of lattice decoration and of the wavy line on cooking-pot necks (Wainwright, 1968, 119-35). The type is illustrated from an immediately post-Conquest horizon at Maiden Castle (Wheeler, 1943, fig. 75, no. 241), although of course there is nothing Roman or even Gallo-Belgic about it, together with undecorated examples such as no. 240, the everted rim of which Tollard Royal informs us was no accident, although the erroneous caption of the figure, as well as the belief that the Iron Age 'C' pottery of the Durotriges was marked by the introduction of the potter's wheel *(ibid.,* 230), has not helped those unfamiliar at first hand with Durotrigian fabric to appreciate the full extent of the approach to our second-century black-burnished ware.

We are unable as yet, pending publication of current excavation of early levels in Dorchester, to trace in detail the development of these forms in the second half of the first century A.D., although it is clear that, as one would expect, pre-Conquest forms such as the jars and bowls with pedestal bases or foot-rings exemplified in the Maiden Castle war cemetery of *c.* A.D. 43 continued in their variety for some years (R.C.H.M., 1970a, 576-7, 579). If it is permissible to use unpublished material at present in the writer's possession from two remarkably homogeneous deposits in Dorchester, it may be possible to shed some further light. In both of these, the filling of a shaft at Wollaston House *(ibid.,* 567), and the make-up of the city rampart at Lee Motors *(ibid.,* 547), neither of them the result of gradual accumulation, a substantial quantity of coarse pottery was recovered, together with respectively some 25 and 20 datable samian sherds, identified by Mr. B. R. Hartley as very largely S. Gaulish ware of Flavian date, with two or three Neronian survivals and, in the rampart deposit, a like number of Hadrianic or indeterminate Central Gaulish pieces. In each case, however, a single sherd demanded a date of manufacture not earlier than *c.* A.D. 125 or 130 and not later than *c.* A.D. 150 or 160.

The *terminus post quem* of each deposit could thus have been as late as early-to mid-Antonine, and is indeed likely to be appreciably later for the rampart make-up, but what matters in the present argument is that it must be highly improbable that the coarse wares in each, which match each other closely, do not share, by and large, the same bracket of *c.* A.D. 70-100 as the bulk of the samian. If this is accepted we find, in the cooking-pots, a minimal survival, perhaps, of the bead-rim variety, but many examples of the upright and everted rims, some (although not a high proportion) with the wavy line on the neck. So precisely do form, fabric and finish match that neither singly nor in bulk would these provoke comment were they to appear in a Hadrianic or Antonine deposit in the North; there are few examples that could be said to hark back to the duller finish and clumsier form of some of the Maiden Castle and Tollard Royal examples, and none showing survival of depressed 'eyebrow' or finger-tip motifs.

'Fancy' bowls and vases hardly appear, and then only as small, probably residual sherds. The flat or 'pie-dish' rim, however, appears already in bowls and dishes, as yet nearly always undecorated if the groups give a fair sample; and the plain-rimmed or vestigially beaded dish is attested in a few instances, with a close lattice or an open one formed of intersecting inverted chevrons. Other black-burnished classes in the two deposits, mostly of romanized forms, do not concern us here, but testify to the ability of the native industry, sustained throughout the Roman period, to supply regional demands for vessels of types produced elsewhere in a range of quite different and generally wheel-thrown fabrics.

This emergence of the bowl with flat rim, Gillam's type 220, in the authentic BB1 fabric, may cast doubt on the accepted view of its development, and that of the pie-dish, type 306, from the wheel-thrown reeded-rim bowls and dishes in lighter coloured wares, although there is no doubt that in the North and elsewhere the similarity of shape led to instances of fusion in form and decoration, before the disappearance of the reeded vessels from the scene. Amongst a small proportion of imported or 'foreign' wheel-thrown wares in the Wollaston House deposit, a single sherd of a reeded-rim bowl (cf. Gillam's type 215), and one of an allied form resembling his type 217, are the only examples the writer can recall ever having seen in the region; the type may therefore be thought an unlikely model for the black-burnished series.

Early markets. There can be no doubt as to the army's early interest in Durotrigian ware. It was the normal cooking pottery in the Claudian establishment at Lake near Wimborne, currently under investigation, and in the forts at Hod Hill (Richmond, 1968) and Waddon Hill (Webster, 1960); at these places, and at South Cadbury where a fort is proved and doubtless Ham Hill, where one is likely, it was the native pottery of the region, accepted because it reached a satisfactory standard for Roman use, as Webster has remarked of Belgic wares in particular. Indeed the experiment of making it on the wheel, in a Claudian pottery at Corfe Mullen close to the site at Lake, together with flagons and mortaria, and rotund bowls or jars (Class D) which may have been intended to take the place of the military 'honey-jar', was evidently not pursued (Calkin, 1935; R.C.H.M., 1970a, 525-6). The occurrence of Durotrigian vessels in the Neronian fortlet at Old Burrow, N. Devon (Fox and Ravenhill, 1966), and in some abundance in the recently discovered fort at Usk, Monmouthshire, ascribed like the former to Scapula, is altogether more telling, since both lie well outside Durotrigian territory. Dr. Dunning also has a sherd of a ribbed 'Maiden Castle war cemetery' bowl from Caerwent.

The same agency may have been responsible, in the first instance, for the introduction of Durotrigian ware to Exeter, notably the countersunk-handled cooking-pot, of which we shall have more to say hereafter, and the plain or ribbed 'war cemetery' bowl, once called Dumnonian, because Durotrigian pottery does not seem to have made its way much beyond the western borders of the tribe before the Conquest (Fox, 1952, 76-92; for the fort, Fox, 1968). Nevertheless exploitation of the civil market must explain the hold it gained there. A similar hold in the Somerset Levels south of the Mendips, exemplified nowhere better than at Westonzoyland near Bridgwater (Miles, 1969), is less easy to ascribe to a Roman military or civil cause, and the writer would prefer to suppose an extension of Durotrigian influence from South Cadbury and the colossal hill-fort at Ham Hill in the years preceding the Roman invasion. The lack of stratified contexts where the pottery can be seen without admixture of Romano-British types *(ibid.,* 25) is not an insuperable difficulty because there are none of these in Dorset, Hampshire or Wiltshire either, except in a handful of extensively excavated

sites. The Durotrigian types at Westonzoyland moreover resemble those of Tollard Royal and Maiden Castle at least as closely as do those of earliest Exeter, but we may be able to see our way towards a solution when we know just how early the pottery industry of the Brue valley, some aspects of which we consider below (p. 93), was established.

Despite these developments there is no sign that military use of black-burnished ware survived the establishment of army depots such as that of Holt, Denbighshire, working in the 'legionary ware' tradition. When it came, the revival of military demand seems to have been simultaneous in the western and northern commands (Simpson, 1964, 77-9) and although the evidence we have noted from Little Chester, Derby, at least serves to remind us of the value of an open mind, it is not possible to point with certainty to military or civil occupation in the province where Gillam's 'ceramic revolution' of *c.* A.D. 120, following which BB1 rapidly replaced lighter cooking fabrics in the North, was anticipated. This is not the same thing as saying that no BB1 ware left the Durotrigian region during this phase of relative dormancy; nor does it mean that a wheel-thrown rival, BB2, could not have an origin, as its revised dating in Gillam's Types paper suggests, around the year 100 or 120.

Later markets. There is more to be said of the evidence for manufacture of black-burnished ware in the Durotrigian region in the Roman period, but we must first consider on what grounds we may claim that the industry was directly concerned in the supply of the province as a whole in the second century or later. The opportunity to examine some of Gillam's black-burnished sherds came in 1965 not long after the writer had become aware, firstly, of the publication of the pottery from Mumrills, suggesting a single large centre of production, somewhere, for BB1, and a similar proposition for BB2, and, secondly, of the conclusion (Gillam, 1955, 73) that 'the large factory which had made the black burnished wares' (i.e. BB1) had succumbed in the disaster of A.D. 367, never to be re-opened. Having observed the close family resemblance in fabric as well as shape between the northern and the southern wares, the writer took the opportunity of considering some of the difficulties involved in these views, in publishing a small group of wasters from a late industry at Corfe Mullen (1968, 174—6), insisting that there must have been more than one source but making no claim for any substantial Durotrigian participation in the supply of the army. A growing belief that this was, in fact, an understatement of the case became a conviction when in 1970-l he was able to examine a much wider range of material in northern museums, concurrently with a re-examination of museum collections in the South primarily in a search for the source of BB2.

One of the difficulties inherent in such an enquiry is that while it is easy to satisfy oneself as to close correspondence between material examined and a familiar fabric known elsewhere, one is often obliged to reject or at least to question material that is really no more atypical of the fabric in question than many examples unquestionably belonging to it in its own homeland. Nevertheless, certain differences touched upon in the Corfe Mullen paper between some of the northern and southern material were confirmed in the wider view. Potters in Dorset did not define the rim of their beaded dish or platter form by a sharply incised groove below the rim as in Gillam's type 316 or 318, and the writer had the satisfaction of having this view confirmed by Dr Peacock's determination of a type 318 from Haltonchesters on Hadrian's Wall as of non-Dorset fabric (heavy mineral slide 78). An impression also gained ground that wavy-line decoration on cooking-pot rims, and lattice decoration—or at any rate close lattice, rather

than a series of inverted chevrons as in Fig. 1, no. 8 (Dorset) or Plate VD (Birdoswald) —on bowls and dishes, was more common in the northern sites, and that the base chamfer might be more consistently a feature of the bowls with flat or 'pie-dish' rim in the North than in the South. It seems likely, too, that cooking-pots of type 118, or at least those that share the particular bead-rim depicted in the type specimen, in which the upper part of the body bends quite sharply inwards in anticipation of the bead to be moulded or turned upon it, do not originate in Dorset, where the bead merely sits on top of the natural curve of the shoulder as it did in pre-Conquest examples like Wheeler's no. 219 (1943, fig. 74). Beakers with round-sectioned rather than two-ribbed handles also seem foreign to the Durotrigian repertory. Such subjective judgements as these will perhaps prove of more value in the selection of material for analysis, and in subsequent evaluations if analysis proves them to correspond with real distinctions in origin, but the first of them, for the Haltonchesters sherd, was enough, even without analysis, to show beyond reasonable doubt the existence of more than one centre making BB1.

The correspondences proved more revealing than the differences, however, and it is here that the writer hopes will emerge the value of what may have seemed to some a tedious examination of minutiae of technique in the foregoing pages. We may be ready to accept parallel evolutionary trends manifested in widely separated parts of the province as a by-product of benefits conferred by the *Pax Romana,* but when we find persistent correspondence in small points of detail which by no stretch of the imagination could be thought to be demanded by the nature of the materials or by the basic methods adopted to produce the finished artifact, we are surely forced to accept the high probability of direct origin in a particular source in which these details can be shown to be endemic, or, failing this, nothing less direct than manufacture by migrant potters from the region.

Neither coincidence nor a theory of parallel evolution could satisfactorily explain the strong scratchy fettling not unusual on the inner walls of a late cooking-pot, although never so common or emphatic in earlier types, when for example it is found in a collection of rejects from a potters' field near Wareham and also in the debris of the occupation of Corbridge (cf. Plate IIIB); neither could it explain the vigorous, scouring burnish of the lower body that, for instance, has almost thinned the wall of a cooking-pot with Burial 243 at Brougham, Westmorland, in the Carlisle Museum, to name only one of several, exactly as we see in the waster group from Corfe Mullen (Farrar, 1968, 180, fig. 1). Tradition alone might have been enough to ensure that BB1 bowls and dishes, once having been given, unlike their BB2 equivalents, an inferior burnish on the outer face, should retain that peculiarity to the end, notwithstanding their having undergone a radical change in shape in the meanwhile. The change in shape, common to all regions and, so far as we can tell, simultaneous, might conceivably reflect some change in cooking practice affecting soldier and civilian alike—perhaps, in the cooking-pots, suspension by the now widely flaring rim, rather than standing in the oven. It may strain credulity to interpret so precisely similar yet widespread a change of design in such terms, but such an explanation will not do at all for the entirely pointless changes in decoration that accompany it. Even where, as in the dish of type 316 or 318, the sharply incised groove has pointed to another source or sources of supply than the Durotrigian, we have found plenty of instances in the North of type 329 with the vestigial beading of the rim that it often has amongst the Durotriges (Plate IVD), as well as cooking-pots of type 118 with the Dorset type of bead-rim. The universality of these foibles bespeaks the maintenance of the closest connection between branches of

the industry, with one of them dominant and enjoying the widest of markets, and it is surely significant that they are all found in the Durotrigian factory sites.

Two special pieces of evidence help to set the seal on a conclusion that would have remarkable implications for the marketing of bulky and fragile products over long distances in Roman Britain. We have already referred to the cooking-pot with countersunk handles (type 126). Although there are types more or less analogous in form, as at Crambeck, the black-burnished ware form is quite distinctive, and no example found outside the territory or near neighbourhood of the Durotriges has ever been published, with the exception of the two listed by Gillam (the type specimen from the fort at Carzield, Dumfriesshire, and the other from Milecastle 48, Poltross Burn). The writer has found a third, a handle sherd with lattice from Balmuildy on the Antonine Wall (Hunterian Museum, F 1922.426). The type, with its origin in Durotrigian Iron Age 'B', and most recently listed by Brailsford (1958, 117-18), is very common in Dorset, including the factory sites in Purbeck, and the implication that it was not made outside the immediate area of Durotrigian influence is as strong as negative evidence can be. The three widely separated examples on the northern frontier, which must stand for a larger number, cannot be regarded as from the baggage of transferred officers, as fine wares might be, even supposing military establishments remained in Durotrigian lands in the second century. The correspondence of the Balmuildy sherd, and at least the one from Poltross Burn, with another from the mainly late first-century group at Wollaston House, Dorchester, with which Poltross Burn is paired in Plate VA, extends remarkably to a distinct black-coring of the clay body sometimes noticed by the writer in BB1, at least in the South. Dr. Peacock has kindly informed him of his identification of Purbeck grits in an unpublished example of the type at Richborough, in a sound first-century context.

The second piece of evidence comes from the occasional practice of scribing a simple pattern on the upper face of the flat base of dishes of type 329, although it must be more frequent than one would suppose from the fact that, as far as the writer knows, it has only once been noticed, although decoration in this position is a little better known on two-handled oval dishes of BB1.[11] The pattern on type 329, of very spare, open type, is illustrated in Fig. 1, no. 7 (cf. Plate IVD), a brilliantly discoloured waster from the potters' field at Redcliff, near Wareham, where it occurs several times, and the name 'Redcliff motif' seems appropriate. The one previously published example, one of several pieces representing an indeterminate number of vessels so decorated, comes from the cremation in the Holborough barrow, Kent, and was discussed by Norman Cook (Jessup, 1954, 46-52, fig. 14). Although it is never sound to rely on a macroscopic identification of sand grits, these burnt dish pieces in the Maidstone Museum appear to match Purbeck BB1 fabric in every detail. The date of the cremation, perhaps to be revised, in the light of re-study of the amphora by Dr. Peacock, from the early to the late third century, is of great value to us, since several vessels of the type, found in association, are more likely than a single one to have been of recent make when placed on the funeral pyre. The writer has noted the 'Redcliff motif' on type 329, to quote only positive identifications, at Richborough, Bush Marsh near Bawdrip, Little Chester (Brassington, 1967, no. 92, though not noted in the report), Corbridge (several), and Chesterholm *(vicus* bath-house, 1970). That so unusual a pattern should occur in the

[11] The oval 'fish-dish', with decoration normally consisting of a pair of triangles united at the apex, and with the other angles touching the side walls, is also among the Redcliff products, but the writer's notes mainly relate to examples, at Gloucester and elsewhere, plain or with nothing more than the usual arcs and under-base scrawl. A specimen on exhibition at Chedworth, however, bears the 'Redcliff motif' hereafter described for the dish type 329.

North is surely as decisive as the appearance there of the Durotrigian countersunk-handled cooking-pot.

The continued involvement of Durotrigian potters in the supply of the North is apparent in that some of the most striking and otherwise irrational correspondences have been quoted for the later third- or fourth-century types. The failure to resume supply of the northern garrisons after the Picts' War may have been due to organizational changes or the exercise of new nepotism in the placing of army contracts, but certainly not to the destruction of the BB1 industry as a whole. The fact that divergences between North and South seem to be more obvious in some of the second-century wares may be due to early attempts by potters, better placed geographically than the Durotriges, to break into a lucrative market, and certainly wheel-thrown imitations, whether Trajanic or not at Little Chester, Derby, are early enough; but until true BB1 industries in the Midlands or elsewhere are shown to have existed sufficiently early, there will be little reason to suppose that the army's initial demand was not directed wholly to the existing Durotrigian sources.

No useful estimate can be made of the distribution of Durotrigian BB1 until we can distinguish with more confidence between sources, or of BB1 in general until we have made more effort to distinguish hand-made or wheel-thrown copies or derivatives in black or grey ware, but, so far as the writer can judge, it is predominantly western and northern, as Gillam first pointed out (1955, 66, map IV), although with sufficient incidence in the Midlands as far east as Leicester, in the Lincoln region, and in the South-East, to imply that we are not concerned solely with a trade along the western seaboard. Although there is no doubt that the earlier BB1 forms are quite often met with in the South-East, for example in London and Colchester, it may not be premature to suggest that the earlier industry enjoyed a smaller market there than it did with its later products, at some stage after the mid-third century, and it is tempting to link this, at least in part, with an attempt to counterbalance the loss of the northern market. The rarity of BB1 in E. Yorkshire, and its absence from the Fens referred to at the beginning of this paper, may be explained by the regional dominance of, for example, 'Huntcliff' and Nene Valley cooking-vessels respectively, but it is not so clear why industries, seemingly of local character, producing wheel-thrown grey ware forms in large measure imitating the black-burnished, were relatively successful in excluding the latter from the E. Midlands (Todd, 1968, 201) and even from military sites in N. Yorkshire (Hartley, 1966, 62-3).

Durotrigian factories. At this point we must consider the nature of the industry that we suppose responsible for an enormous output of ware vastly outweighing that of any other pottery industry in Roman Britain. Apart from the late industry at Corfe Mullen, and its Claudian precursor producing wheel-thrown wares, of which sufficient particulars have been given above (pp. 87 and 88), production on some considerable scale on the western, Purbeck shores of Poole Harbour is suggested at Ower in the parish of Corfe Castle, and at Redcliff Farm, Ridge, and Nutcrack Lane, Stoborough, both in the parish of Arne near Wareham (R.C.H.M., 1970a, 525-6, 592-3, 597-8). Of these three only brief notes of the sites have been published, although most of the material is at present in the writer's hands with a view to full publication. Some four more sites in Arne, at Worgret, Arne Heath, Big Wood, and Shipstal, two more in Corfe Castle, at Norden and Fitzworth, and one in Studland at Godlingston Heath, for which the R.C.H.M. volume (1970a) may be consulted, have at one time or another yielded evidence that they might be of similar character, while, outside these Tertiary

heathlands, one site on the Chalk, at Bagber, Milton Abbas, not re-located, has been claimed as a pottery factory on grounds that do not seem as compelling as they once did (R.C.H.M., 1970b, 199-200), although the records suggest a high proportion of handled flasks in black-burnished ware, one of which survives complete in the Dorset County Museum.

Oxidized sherds are characteristic of the heathland sites, except perhaps at Worgret and Norden where the pottery does not survive, and although about half of these sites show evidence of the production of salt by boiling sea-water or brine in coarse clay containers (an industry wholly compatible here, as in Lincolnshire, Kent and elsewhere, with the manufacture of pottery), there is no doubt at the three principal sites, as indeed in both early and late industries at Corfe Mullen, that the presence of a preponderance of oxidized debris rather than of fused or contorted wasters is to be expected of sites of the black-burnished pottery industry. Nevertheless the writer has come to appreciate the presence of severely cracked as well as violently discoloured specimens at Stoborough, and at Redcliff Farm (e.g. a cooking-pot in the Christchurch Museum, Plate IB), thanks to the impressive collection of material by Mr. P. A. Brown and the late H. G. Burr.

No wholly satisfactory explanation presents itself for such accumulations of oxidized although frequently not, as far as one can see, otherwise substandard material, although it implies rejection prior to soot-soaking or reduction. What is significant here is the likelihood that wholly unmarketable waste was not so important a factor in the manufacture of this kind of ware, and the industry might thus have been able to compete on more level terms with others nearer to some of the major markets. Nevertheless something more than this is required to explain the remarkable and sustained vogue of its products.

Since surface signs positively indicating pottery-making, rather than salt-production or domestic occupation, will be few, it may be assumed that further sites of this kind will ultimately be proved in Purbeck and elsewhere. Nonetheless the extant remains, even on the most optimistic view of the sites listed, cannot be thought impressive in the context. At the same time, prehistoric sites of production, both here and elsewhere in Britain where there is evidence for specialized industries rather than a domestic craft, have hidden themselves even more effectively, and while many of us learnt at the March conference for the first time of kilns of very early Roman date at Rushden in the upper Nene Valley, devoid of permanent incombustible structure and given away most obviously by the presence of firebars, we cannot suppose that kilns of this kind, however easy to overlook, existed in such quantities as to account for the great bulk of Belgic and other late pre-Roman wares. The conclusion is unavoidable that these wares were fired in bonfires such as those discussed by Hodges (1965, 36,40). Since the Durotrigian pottery industry of the Roman period was a continuation of the Iron Age industry and retained its basic methods of pot-building to the end, there is no reason to expect any general change in firing methods either. Only one site in Purbeck, Fitzworth, has yielded anything in the nature of firebars that might belong to a pottery rather than a salt-making industry, and, while it is true that a few small areas alone have been excavated, it need occasion no surprise that the only evidence the region can produce for kiln structures is at Claudian Corfe Mullen, where the industry was patently romanized, presumably on an experimental basis, and at Ower where the kiln, of 'horizontal-draught' type, had flues so small in aperture as to render its true purpose questionable (R.C.H.M., 1970a, 597).

At Stoborough, the only structure found, a puddling-hole lined with chalk and

fire-hardened clay *(ibid.,* 593, fig.), sat in and upon a series of deposits of ash or ashy earth and sand, containing sherds and cracked wasters, totalling some 1.5 m. in thickness; ash deposits have also been recorded in two places some 100 m. to the south-west, and at the nearby site on Redcliff Farm again in association with wasters and rejects, not a few of them substantially complete or restorable.

It may be that we have here, not a reason for surprise that so primitive an industry could satisfy so large and insistent a market as that of the Roman army in Britain, but the key to its success. In explanation, we must return to the modern Turkish industry, to which we have already referred by the kind permission of Henry Hodges (p. 73), to whom the writer is of course indebted for the information here summarized. The women of Sorkun, a village of fifty houses, hand-make for the Ankara market over a quarter of a million casseroles annually of the kind illustrated in Plate IVC. A single firing, rising to some 500 or 600° C., consists usually of 2,000 to 3,000 pots, or occasionally up to 7,000, placed on the ground in rows, and fired successively down wind, with dead pinewood and field rubbish added as necessary to keep covered with ash those vessels for which a black surface is required. The pots are inverted, and grassy rubbish placed inside is sufficient to ensure a black interior. The naturally refractory clay that fits them for their purpose reduces spoiling to as little as two or three vessels in a firing, and enables conditions to be tested safely by hooking out specimens during the process.

Although we cannot simply transfer such figures to black-burnished ware, they do indicate something of the potential of an industry in which the construction and maintenance of kilns, with their relatively small loads, are both unnecessary and uneconomic.[12] A few Durotrigian communities of the size of Sorkun, or more smaller ones, may thus be seen as an adequate and even conveniently centralized source from which to draw, in the homeland or even conceivably by re-settlement nearer the frontiers.

The Somerset industry. Almost everything said about the character of the Purbeck material could also be said of that of the Brue Valley, Somerset—indeed it has already been said (Miles, 1969, 25-6). Here, however, upstanding or buried mounds containing oxidized and sometimes crumbling pottery together with salting *briquetage,* are a distinctive feature, while wheel-thrown wares in various fabrics (including, perhaps, some black burnished) appear in quantity, as well as BB1. Bulleid's paper (1913-14) is still our major source. Manufacture of BB1 here is confirmed by examples showing minor but distinctive features, of which the most obvious is the occasional substitution of a tooled herring-bone pattern, not known in Dorset, in place of the narrow band of obtuse-angled lattice in late cooking-pots, as in Bulleid's fig. 2, no. 11. Until current work by Mr. and Mrs. Langdon and by Trevor Miles, the only mounds sampled were those by Bulleid, and by Dewar in 1930 (1949, 201), so any conclusion on the industry's life-span would be premature, but Dewar's material in the museum at Taunton and therefore consisting of or including what he recovered in 1941 from *below* the Puriton and Huntspill clay (Dewar and Seaby, 1948-9, 162) comprised cooking-pots and flanged bowls of normal late type, which the writer would not be prepared to date, even on a conservative view, earlier than *c.* A.D. 250. Bulleid's illustrated material, or most of it, is a close match. If one avoids the assumption that all typologically 'early' cooking-pot rims of upright or slightly everted pitch, without the wavy line and unaccompanied

[12] A similar explanation might serve for the failure to find an adequate source, in kilns, as at Crambeck, for the hand-made, or partly hand-made 'Huntcliff' jars.

by sherds of the appropriate acute-angled lattice or by bowls or dishes with 'pie-dish' rims, are necessarily early in date, when produced in a particular centre of which very little is known, there may be nothing at all in the BB1 range there to demand a date before the mid-third century. The writer has, however, studied only a small proportion of Mrs. Langdon's material, and his views seem at variance with those of Mr. and Mrs. Miles (1969, 26).[13] Dewar and Seaby also offer a reasonable case for supposing the countersunk-handled cooking-pot of Gillam's type 126, from the Huntspill Cut, which is indeed of the second or even the first century, to be a waster.

There is nothing improbable in such an early date for the establishment of a BB1 industry in this commercial if not perhaps also political corridor of the Durotriges to the Bristol Channel, which we have seen (p. 87) to have yielded abundant early, perhaps even pre-Conquest, Durotrigian pottery; and all the distinctive secondary characteristics of finish, in the late cooking-pots and bowls, which we need not repeat, attest a close connection between the late Purbeck and Brue Valley industries, not excluding continued imports from the former such as the dish we have earlier quoted with 'Redcliff motif' at Bush Marsh. The Somerset industry, both in the postulated early and in the later manifestation, may most plausibly be considered a branch of the Durotrigian, although there is as yet no published evidence for unbroken production, in the second century or first half of the third. Scientific analysis will doubtless show whether it played a part in the supply of the army, for which its situation would better fit it, but the distinctive herring-bone variant in the decoration of some of the cooking-pots has only been noted elsewhere, unpublished, in the museum at Richborough, significantly, in the light of the foregoing, from Pit 303 dated 'fourth century'.

Other BB1 industries. Failure to find *kilns* of BB1 in the Midlands or the North (Gillam, 1955, 68; Frere, 1967, 292-3) will not now surprise us, and it follows that we need no longer assume that some of the ware might not have been made on or near the frontier itself. Kilns, however, as we shall see, need not be dismissed as inappropriate in a BB1 centre, if only because they might have served for special wares needing higher and more controlled temperatures, but brief examination at Lincoln of the material from kilns at Little London, Torksey (Oswald, 1937), and at Doncaster of that from Cantley, kilns l-8 (Annable, 1960), similar to the series from kilns 9-25 (Cregeen, 1956), confirmed that these were fairly coarsely-gritted cooking wares of the wheel-thrown grey variety.

The kilns at Rossington Bridge (Pumping Station), 2½ km. south of Cantley, however, excavated by J. R. Lidster, are known to have produced various types, including mortaria by the Antonine potter Sarrius, and rusticated, roller-stamped and 'Parisian' wares, but they were brought to the writer's attention in the present context by Mr. P. C. Buckland, who hopes to undertake their publication and meanwhile authorizes him to communicate some of the results of the preliminary review. Examination by the writer of five complete or restored examples on exhibition in the Doncaster Museum, two of them completely or partly oxidized, at once confirmed their attribution to BB1, and the production, understood to form a large proportion of the waste

[13] The writer is reluctant to accept the unstratified cooking-pots, nos. 75-6, from the occupation site at Westonzoyland, on which their argument for a relatively and exclusively early date for the industry seems to depend, as likely to be earlier than *c.* A.D. 250, despite the wavy line shown on the neck of no. 76, since a survival or a casual imitation of the latter feature is much easier to accept than an anticipation of the narrow band of obtuse lattice. Nor is it clear to him why early material beneath the clay at Highbridge should carry the developed Brue Valley BB1 industry with it, even had pottery of this type or source been specified; the onus of disproof of Dewar's evidence for the late date of the clay in this area in any case lies on those who suggest one earlier than the later third century at the very least.

material from the site, is thus the first to be demonstrated outside the cultural sphere of the Durotriges. It seems, however, at least so far as the known remains can be assumed to give a true picture of the BB1 industry in the region,[14] to have had a relatively short life, in the later second and early third century, and leaves us still to seek sources additional to Purbeck for much of the period in question.

Mr. Buckland describes the Rossington ware as perhaps 'lighter in general overall colour than the Dorset', and the writer is informed that sherds that might be assigned with some confidence to Rossington rather than to Purbeck could be picked out amongst northern and Scottish material exhibited by himself at Oxford in 1972. Heavy mineral analysis by Mr. N. Loughlin at Southampton University showed a suite high in tourmaline, although not so high as in the Purbeck ware; difficulty in distinguishing source would lie rather between Rossington ware and others that might prove to contain grit similarly derived from the Bunter Sandstone of the Midlands. The wavy-line decoration common on the necks of cooking-pots has not been noticed, but this is in any case believed to be a declining feature in the later second century. A few flanged bowls occurred in the ware.

The writer's own impression, from the few vessels he was able to examine, that shared peculiarities of technique, although always less obvious in these more varied but less idiosyncratic earlier forms, imply a close link with the Durotrigian industry, receives some support from Mr. Buckland's comment that 'certain vessels . . . seem to hark back closer to the S.W. Iron Age precedents and the possibility of Dorset potters being involved remains likely'.

It is of some interest that both the industries so far known outside Purbeck, those of the Brue Valley and Rossington, appear to have been involved in producing wheel-thrown wares in various fabrics, as well as BB1, and it may be that this branch of the Rossington industry, evidently relying on firing in kilns, possessed no advantages enabling it to sustain competition either with the more ancient industry or with the newer industries making imitations in wheel-thrown grey or black wares. One of these, its near neighbour and contemporary, Cantley, went on to produce in quantity the forms of flanged bowl that mark the third and fourth-century industries, while some at least of the black-burnished vessels on exhibition in the Museum from sites in the Doncaster area evidently come from other sources; for instance a cooking-pot from the *vicus* at Frenchgate, with a wavy-lined neck and body decoration of paired verticals, and a characteristic 'Dorset-type' late cooking-pot with all the usual features of decoration and internal scratch-marks, from the Museum's older collections (439x).

A similar impression was gained at Lincoln when material from the one kiln known at the Lincoln Racecourse, and dated early third-century rather than Antonine by the late Dr. Corder (1950), was examined and compared with a range of Flavian to later third- or fourth-century coarse wares from the *colonia* excavations at East Bight (Thompson, 1956, 30-l). Amongst a good quantity of BB1 and wheel-thrown black-burnished ware, and a few scraps probably of BB2, there was nothing representing an industry of the Racecourse kiln type, and Mr. G. Coppack has confirmed its regional elusiveness. Although this suggests a short-lived and not very important factory, it is nonetheless of some particular interest to us, for its products proved to be a hand-made grey burnished ware differing only substantially in colour from BB1.

The ware is quite coarsely gritted but with a good clay matrix, relatively close in

[14] Mr. Buckland mentions some material, probably to be classified as black-burnished, from an unlocated kiln near Acacia Road, Cantley.

texture and fairly smooth in fracture, but showing no colour 'lamination'. It is not particularly hard. Corder has described the decoration with typical care, noting the distinctive character of the bowl and dish arcading which runs in continuous loops where not cut off by subsequent burnishing of the chamfer. The rather poor, dull burnish is of even quality over the whole surface of these forms and is matched by that of the rim and shoulder of the cooking-pots, where the lower body is roughly smoothed, and the inner surface a fine-grained matt. The cooking-pots are particularly smooth and regular, with rims certainly formed on the turn-table, the bowls and dishes for the most part less neat and more markedly faceted in finish. The dominant colour is a light to medium grey throughout, but quite a few are dark grey or black, generally on the outer face only.

Since we cannot tell whether more kilns existed nearby and are obliged to consider the ware as the product of a single one, it is possible that the predominant colour was the result of accident or miscalculation; had it been black it would probably have been necessary to classify it as a variety of BB1, standing at one remove from the pure tradition apparently represented at Rossington. The term 'grey-burnished ware' meanwhile seems appropriate. Although it has the wavy-line decoration of the neck which does not occur at the Racecourse, a complete cremation vessel in the Museum (270.12), from the Rasen Lane cemetery, is illustrated in Fig. 1, no. 6; its colour suggests that it may belong to the Racecourse industry, and if so would go a long way towards proving that the grey colour was intentional.

Although showing no marked similarity to the Racecourse types in finish, and certainly not in the peculiar looping of the bowl and dish decoration, a respectable number of sherds seen during the survey of the northern collections could deserve classification as 'grey-burnished ware'. Notable examples are Mumrills no. 33 (Gillam, 1960-1), and Corbridge no. 33 (Richmond and Gillam, 1950, 188) which is, in fact, Gillam's late second-century type specimen no. 138 erroneously listed as BB2 in revised editions of the Types paper. An exceptional finesse of detail in the outer face of the cooking-pots shows they are not discoloured BB1. It is difficult to illustrate examples effectively, but an attempt is made in Plate VC, with the inner faces of the two upper sherds from Milecastle 79 and Milecastle 48 (Poltross Burn) respectively, contrasted with the wheel-marked interior of a hard wheel-thrown grey ware from Corbridge. The grey-burnished pair show no rilling, but present a very even, matt, and, as is not unusual, lightly striated (probably wiped) face, which otherwise is of a fine-grained matt as in the Lincoln series. The inner rim burnish, here as always, reaches the junction with the shoulder, as it does not do in wheel-thrown types. The external moulding of the rim, especially where, as is usual, there is a lip-beading, is executed on the turn-table almost as sharply as in wheel-throwing, but the shoulder and as far as possible the neck, show the same irregular facet-burnish as in BB1. The rims are upright or slightly everted, and lip-beaded, and may be as tall as in the hard wheel-thrown grey types Gillam 133 and 135, but shorter and more curved lip-beaded rims are also common; examples occur with the wavy line. The body is more obviously sandy than the Lincoln Racecourse type, much, in fact, as in BB1 or 2, and its colour is much the same as the surface colour, without 'lamination' which seems unusual in the ware. The later third- and fourth-century type of cooking-pot, or of bowl and dish, does not appear in this ware. The bowls and dishes are usually flat-rimmed although perhaps sometimes of the plain or beaded type seen at Lincoln, and latticed like the cooking-pots, differing from BB1 only in colour and therefore likely to have escaped notice altogether had not the cooking-pots demanded recognition, although one of several examples at Mumrills,

no. 56, with an under-base scrawl, was commented upon as of distinctive fabric. There can be no doubt that many of these vessels are swallowed up in attributions to BB1, or to wheel-thrown grey ware types, but they constitute a distinct variety which must be reckoned with if we are safely to make selection for and apply the results of future scientific analysis.

Category 2

Origins. Peacock's heavy mineral analysis (1967, 100) has indicated a source for BB2 somewhere east of a line between E. Yorkshire and Dorset. The military distribution of the ware, in Scotland where its arrival coincided with or followed soon after the building of the Antonine Wall in *c.* A.D. 140, and in the eastern sector of Hadrian's Wall and its hinterland where its arrival coincided, by and large, with the reversion to that frontier now generally if not universally agreed to have taken place about A.D. 163,[15] has been discussed by Gillam and Mann (1970, 32-6). Distribution has not been closely studied elsewhere, but it is clear that apart from some incidence in northern Yorkshire which may be associated with that of the frontier hinterland, it falls within the area defined by Peacock. Since we cannot easily suppose an industry based in the civil zone solely to supply northern military units several hundred miles away, without some sign of a regional market for similar wares, the search for the source can be narrowed down to the more extreme South-East, i.e. Kent, the London region and Essex, and perhaps immediately peripheral districts. Outside this region any sign of BB2 or comparable types rapidly withers to the occasional cooking-pot and, less uncommonly, bowls and dishes in various fabrics with 'triangular' or rounded rims, like types 216.3 or 218-9 at Fishbourne, the earliest of which are referred to the late-first or early-second century (Cunliffe, 1971).

It was shown conclusively at Mumrills that BB2 was a parallel development and not merely a stage in the evolution of BB1, but since no independent tradition of black-burnished cooking vessels of this type existed in pre-Roman Britain or was introduced in the wake of the Conquest, it is obvious that it was modelled directly or indirectly on BB1. How and where this took place is a mystery. The Durotrigian region is not only devoid of BB2 but seemingly well insulated from it and there is as yet no sign of a trade or early military demand remotely comparable with what took Durotrigian ware to Exeter or Usk, and which could have made it familiar in the South-East. The distinctive chamfered bowl with 'triangular' rim appears in a pit dated 80-120 at Richborough (Bushe-Fox, 1932, no. 339), and this form and others with plain or grooved rims at Verulamium, in hard grey or dark grey ware, which are at any rate close parallels although evidently not all of BB2, were already quite well established in the period A.D. 130-50 (Frere, 1972, e.g. nos. 715-18, 720-3, 733, 735). This is too early to allow us to postulate an early-Antonine military initiative behind the first production of BB2; business enterprise on the part of a merchant or south-eastern potter, in adapting an alien form to the wheel technique early established in the Belgic areas, seems the most likely alternative, but we do not yet know whether BB2 was anticipated in pirating BB1 forms by any other industry of importance producing black or grey wheel-thrown wares, although we have already noted, at Fishbourne and Verulamium, some evidence that such industries were early in the field.

Sources. Northern scholars take the view that the military garrisons were supplied by sea with the products of a large centralized BB2 industry situated in the South-East,

[15] This signifies some retreat, in statements as yet unpublished, from the view (Gillam and Mann, 1970,43) favouring a late Antonine re-occupation of the Antonine Wall and a final abandonment *c.* A.D. 207.

much as they suppose BB1 was supplied by a western sea route from some centre in the W. Midlands (Gillam, 1960-1, 126-9). At one time the early context of the Richborough bowl, no. 339, encouraged belief in a source in Kent, but the conformity between special peculiarities in the distribution of BB2 on the two Walls and that of proven Colchester mortaria has now led to fixture upon a probable source at or near the *colonia* (Gillam and Mann, 1970, 30-6). The writer, however, suggests that the evidence of distribution does not necessarily point to Colchester as more than an entrepôt in the trade, and believes that any conclusion as to centralization of the industry on evidence so far adduced is to prejudge the issue.

Spectrographic analysis by Mrs. Richards of trace elements in the clay of BB1 and BB2 at Mumrills (Gillam, 1960-1, 129-32) professed to prove no more than a difference of source between the two categories, and had it done more would not necessarily have done so for any consignments other than those represented by the Mumrills sherds. Since Peacock's analyses, as we noted, showed that heavy mineral constituents of the sand are unlikely to indicate a specific source for BB2, further progress in this direction is likely to involve the application of various available scientific techniques to the determination of identity between suites of trace elements in the clay of the site finds on the one hand, and of material from the potential region of production, and best of all from kilns, on the other. Before considering what evidence exists for kilns producing BB2 ware in the South-East, we must consider what bearing the evidence in general has upon the concept of a centralized industry and its location.

Belief in a single large factory for BB2 clearly involves the supposition that the industry supplying the North was responsible for at least the great bulk of the ware in the South-East as well, the alternative being a number of distinct centres producing ware of the same kind, whether or not one of them was pre-eminent, or enjoyed a monopoly of a particular external market. In either case we would expect to find, in the South-East as a whole, or in that part of it where a particular centre possessing a monopoly of the northern market was situated, some reflection of the homogeneity displayed by the northern site finds, and which, in essentials, we have not called in question. It is the peculiar problem of the industry that we do not seem to find this.

The difficulty arises almost entirely with the cooking-pots. While it is not difficult throughout our region, whether in the literature or the collections, to assemble bowls and dishes conforming in every detail of form and finish to northern examples, the cooking-pots, although equally conformable, as in the London specimen shown in Plate IIIC (Guildhall Mus., 2996), and equally widely distributed, are by no means so easy to find. Thus in Hull's corpus for Colchester (1958, 279-92) our cooking-pot is too rare to have compelled recognition among the latticed types 279a-c, though certainly present in modest quantity in the Museum (e.g. 171.30, Fig. 1, no. 2); form 278 ought to stand for a variety of large latticed jars only a few of which appear to be of BB2. Even where all varieties of black-burnished and latticed grey wares, seen together at Verulamium and perceptively drawn by Marion Wilson, make a respectable display for a region not rich in these types, no more than two cooking-pots (Frere, 1972, nos. 616-7) can be picked out that look as if they might repay inspection as of BB2. It is otherwise with the bowls and dishes, and the same is true of the London region and Kent, and indeed throughout the whole area of distribution. Handled beakers of Gillam's (BB2) type 65 and the less common bead-rim cooking-pots have not presented themselves at all, at least in the collections seen, although two latticed bead-rim jars illustrated at Richborough, for example no. 251 (Bushe-Fox, 1932, pl. xxxv), have not been examined. Gillam's type 137, with straight everted rim, is also elusive.

Another London vessel (Fig. 1, no. 5, Guildhall Mus., 24119), although not wholly typical of its class in its relatively short rim and barrel-shaped body, reminds us that the macroscopic identity of fabric and finish between northern and south-eastern finds extends to the frequent presence of remains of slip applied to rim and shoulder. Its purpose here, however, is to draw attention to another quantitative element of disharmony. Although we have attempted to show that variant decorative schemes on the cooking-pots, such as we see here and in Plate IIID (London; Guildhall Mus., 21996), are more common on the frontier sites than has been allowed for, one is not prepared to find, as we do, that they seem to occur as frequently as ordinary lattice, on our south-eastern examples. We shall see this to be true of Kent and Essex when we consider kilns; the point is well made for London, ignoring the narrow-based vases, by the cavetto-rim series from the grave-groups (R.C.H.M., 1928, figs. 65, 67, 69).

It is not at all easy to assess what sort of significance ought to be attached to these two major points of disparity. On the face of it, the second may be thought the more serious, since the Roman soldier, if anything like his later counterpart, is more likely to have discriminated about what was in rather than on his cooking-pot, and it could be held to imply sources for the army supply at least largely distinct from those filling some or all of the regional need. The shortage of cooking-pots, on the other hand, can be explained so as to eliminate or reduce its relevance, although not so as to absolve us from the duty of searching for an area, perhaps very restricted, where cooking-pots of BB2 are more tellingly represented. Throughout the whole of the South-East undoubted preference was shown, possibly until the expansion of the later trade in BB1 and the emergence of late calcite-gritted ware industries, for a more truly indigenous type of cooking-pot like Colchester types 266-8 (Hull, 1958, 283-5) believed to be based ultimately on Haltern type 57, and for the similar forms of Kent, London, Hertfordshire, and the Nene Valley (Kenyon, 1959, 53-5; Corder, 1941, 283-9; Hartley, 1960, fig. 3, no. 4). We could therefore presume sales resistance to the BB2 type, with most of the output going to the North, whereas the bowls and dishes contended only with diminishing competition from the reeded-rim and sub-Belgic types.

BB2 factories. A search, that does not claim to be exhaustive, for relevant kilns has yielded some result. Least can be safely said at present of the 'Upchurch' industry of the Medway marshes near Rochester, associated with salt-boiling, although its size and the ignorance due to its partial submergence give it a potential significance that ought not to be ignored. Latticed black wares do not form a substantial part of the varied products known, despite the Milfordhope waster inaccessible through no fault of its finder (Hume, 1954, fig. 2, no. 7). Some 12 km. north-west, on the Thames estuary at East Creek, Cooling, some factory refuse, of various fabrics, recently examined by A. Miles and M. Syddell, includes bowl and dish sherds in every way acceptable as typologically 'late' BB2 forms, but the very few rims approaching if not quite achieving the true cavetto form are uncharacteristic of the cooking-pot series, which seems to belong to the south-eastern type to which we have referred. Cooling also yields salt-boiling *briquetage.*

Material from two published kiln sites further upstream has been re-examined—the first at Chalk near Gravesend, with pottery described by Warhurst, and probably only one of a number of kilns in or near the marshes towards Cliffe and Cooling (Allen, 1954); the second at Joyden's Wood on the east side of the Cray valley near Bexley (Tester and Caiger, 1954). At Chalk, allowing for the frequently inferior quality of

factory refuse, cavetto-rim cooking-pots with lattice or vertical linear pattern, and bowls or dishes with rounded (occasionally 'triangular'), plain, or grooved rims, and of fabric and finish consistent with BB2, formed the major part of the ware thought to have been manufactured at the site; 'Charlton type' bead-rim jars were also made. Many of the cooking-pots showed a rim and shoulder slip, but some element of divergence appears, in that some rims recurve rather than spring sharply from the shoulder, and so are not of true cavetto form, while some thicken slightly towards the lip.

The material from Joyden's Wood is very similar to that from Chalk some 17 km. to the east, Mr. Tester now believing that the cooking-pots as well as the bowls and dishes were made on the site. Few retain the silky surface. Many of the better preserved cooking-pot rims show a black slip; the cavetto form is well maintained, and the tendency of some to thicken in section towards the lip is hardly noticeable, save in a few extreme cases like no. 22 in the report. There is no indication of the decoration except in the vertical linear scheme of no. 24 (not seen). The bowls and dishes were mostly of rounded-rim form and apparently undecorated, although 'triangular' rims, with surviving lattice, were not so rare as at Chalk; the majority had more nearly upright sides than the types figured, and the very few plain-rimmed dished (nos. 29-30), not certainly wheel-thrown, were in neither BB1 nor BB2.

The respective Hadrianic and early Antonine dates proposed for the remains at these two sites need not be disputed, but, as so often with factory refuse, cannot be demonstrated so firmly as to carry with it the rounded-rim bowl and dish types, which do not appear before the end of the second century in the northern deposits.

The thickened cavetto which we noticed at Chalk is exemplified in the useful series, relatively rich in cooking-pots as well as bowls and dishes, from Greenhithe (Detsicas, 1966, 170; fig. 6). How far the forms at Greenhithe match those at Cooling may be seen in due course, but it is hard to compare them with the more fragmentary sherds from the two published kiln sites. The rather straight eversion of some of the cooking-pot rims at Greenhithe, their apparently invariable rim-thickening, the compromise between 'triangular' and rounded forms of rim in the bowls and dishes, and the thick walls and rounded profiles that so often characterize the latter forms *(ibid.,* 152, fig. 14), mark them off from northern BB2, and indeed from the generality of south-eastern BB2 as well, so that one suspects another local industry here, datable on site evidence to the late second century.

There is some indication, in sites still under investigation, that a similar situation may prevail on the Essex side of the estuary. In kiln no. 2 at Mucking near Tilbury, opposite Cliffe and Cooling, rounded-rim and grooved-rim dishes, plain or chamfered, figure among the types, and also a cooking-pot, which can be latticed, with a rim falling short of the cavetto form only in a lip-beading (information from drawings by Mr. W. J. Rodwell). At Canvey Island near Southend, also known for its salt-boiling debris and 'red-hills', black-burnished latticed pottery, characteristic of the red-hills but rare or missing at inland sites like Wickford, has been thought by him to suggest a Thames-side pottery industry, although neither kilns nor undoubted wasters have been found. A selection seen by the writer included two pieces of late BB1, and a number of cavetto rims and 'triangular' and rounded rims of BB2 type.

Although none of these sites can on present evidence lay claim to a share in the supply of the army, it is surely not unreasonable to hold that they imply at least a modest production of locally variable BB2 as well as other wares, and that there can be no such thing as a centralized BB2 industry. If a major centre is required for what may in reality have amounted to no more than a few ship-loads of BB2, at intervals, to

military depots in the North, it may lie below the waters of the Medway or the Thames. Alternatively the industry may have been dispersed and its produce assembled for shipment by some *negotiator artis cretariae* based upon Colchester.

The *colonia* itself lays no better claim to be the producer, Here, of course, knowledge of the pottery industry is unrivalled owing to the energies of M. R. Hull, but despite the best efforts of all concerned the material from the more pertinent kilns has not been available for study. As we would expect, black-burnished cooking-pots are least in evidence, and attention need only to be given to fig. 76, 5-6 (Hull, 1963, 137-8) from near kiln 15 with another in pieces in kiln 16, and perhaps to fig. 93, no. 17, from kiln 27 or 28 *(ibid.,* 164). The first two, of which no. 5 was a waster, are representative of pieces of about 80 vessels from the area as a whole, and of the frequency of the grouped verticals and multilinear lattice variants in decoration. The third repeats the grouped verticals and has a rim resembling some of those we have cited in Kent; although there were fragments of 65 of the type (Hull's form 278, which covers other fabrics besides BB2, and extreme variation in size) the wares were said to be varied and there is no indication of how much belonged to ours. There is no evidence anywhere of more than minor production of a minor regional type, as the chart *(ibid.,* 177-8) amply shows.

There is no unambiguous testimony to manufacture of the earlier, latticed bowls and dishes of BB2 (Gillam's 222-3, 310-11), although these are well represented in Colchester. Most of the 150 sherds *(op. cit.,* 136) of Hull's form 37 came from the excavation of the enclosure associated with the colour-coated and samian ware kilns and could have come from the demolished kiln 19. None is illustrated, and although Hull's type specimen for his form 37 might be thought to define them all as of BB2, the three illustrated examples out of five described as of this form from the area of kiln 13 *(ibid.,* fig. 8, nos. 27-9) are unacceptable in shape. No production is attested in any other known Colchester kiln.

Consideration of the later types of bowl and dish with rounded rim (Gillam's 225, 313), and of those with plain or grooved rim, which are not yet positively shown to have reached the northern units after *c.* A.D. 200 (328, and types added by Gillam and Mann, 1970), brings us fittingly to our conclusion. These are Hull's forms 38 and 40A and B, mostly undecorated but some with the wavy-line decoration familiar in BB2 forms, and examples in the Colchester Museum, agreeable with BB2 in fabric and silky burnish, are presumably equivalent to those from the potteries. They occur significantly in the kiln enclosure already mentioned, dated to *c.* A.D. 175-210, and at kilns 27-8, dated *c.* **A.D.** 300, although in neither case securely *(op. cit.,* 136, 178; fig. 93, nos. 1-8, cf. fig. 6, nos. 13-14). There can, however, be no doubt that these forms, often more raking in profile, and tending to lose their basal chamfer, as Hull tells us, after c. A.D. 300, remain an important element in the regional pottery of the fourth century, although they will appear in grey ware and perhaps other black-burnished fabrics as well. Similar forms with silkily burnished black or grey surfaces—the rounded-rim form as much as any other-seem in the writer's experience to persist in late third and fourth-century deposits in Cambridge, alongside the new flanged-rim bowls and dishes.

Do such things signify the survival of a BB2 industry after its unexplained failure to retain its northern military market in the later third century? We fail to see the signs we would expect, by analogy with BB1 and other industries making latticed jars, of a move at about this time towards the common attenuation in body and rim proportions of cooking-pots, but if we are right in supposing that the demand for this class of vessel in BB2 had always been essentially military, its disappearance unmodified need imply

no more than adaptation to a reduced market. Having seen evidence of the existence of a number of separate factories, perhaps all of minor character, making identical or largely identical ware, we are bound to suppose that some of them, like that of Colchester, or others not yet discovered, continued in production for some while after *c.* A.D. 250. We may suspect that, in that sense a 'BB2 industry' did survive. Failure, however, to market—at least on any substantial scale[16]—a version in Category 2 of the immensely popular flanged bowl or dish seen in almost every other fabric, does suggest that the end of the military connection occasioned, or coincided with the closure of some very important branch of the industry, or involved a disruption in the organization of the trade that reduced discrete factories to the status of ailing local potteries.

SUMMARY

Criteria for distinction between the two major categories (BB1 and BB2) and other varieties of the common 'black-burnished' cooking pottery of Roman Britain are considered with special reference to neglected and misunderstood differences between hand-made and wheel-thrown wares. The pre-Roman Durotrigian origin of BB1 and a continuing share by Purbeck potteries in the supply of the armies, probably through mass-firings in bonfires, are claimed, with derivative industries in Somerset and S. Yorkshire. The origin and eventual fate of the rival BB2 industry are discussed and a case made out for decentralized production around the Thames estuary and Colchester.

[16] The qualification recognizes the likelihood of some production of new types by potters who might have carried on a BB2 tradition into the later third or fourth century, and Mr. A. P. Detsícas has kindly drawn the writer's attention to flanged bowls and dishes, especially in his current excavations at Eccles, Kent, accompanying cooking-pots, bowls and dishes of accepted BB2 form and of similar fabric and finish. Neither in our Kent potteries, however, nor in those of Colchester where we have seen some evidence suggesting a late BB2 industry, can we yet point to the manufacture of flanged types by the same potters, and we must recognize that any such products of a BB2 Potter would, away from the kilns, be difficult or impossible to distinguish, certainly without scientific analysis, from those of any other wheel-thrown black-burnished ware industry.

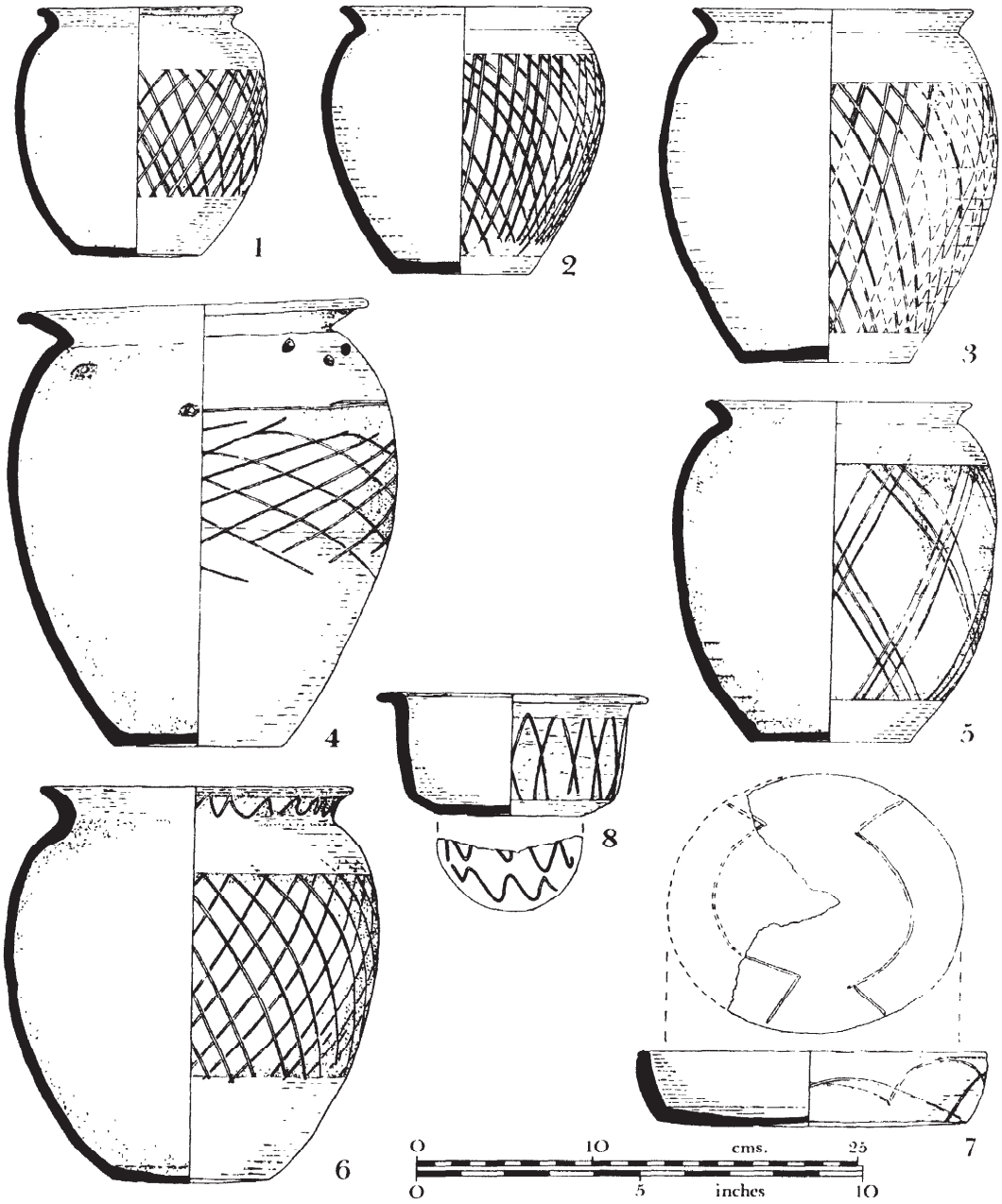


FIG. 1. (Scale: ¼)
Black-burnished Vessels of Category 1 (nos. 1, 4, 7, 8), Category 2 (nos. 2, 3, 5) and Category 1 or allied Fabric (no. 6).

THE POTTERY INDUSTRY OF THE OXFORD REGION

CHRISTOPHER YOUNG

THIS paper is an interim report of a long-term study of the development and significance of the Oxford pottery industry and its conclusions should not be regarded as final.[1]

The earliest recorded discovery of a kiln site in the Oxford region was at Fencot in the early nineteenth century (Hussey, 1841, 33-4) though the nature of this site is not certain. Surer ground was reached by the discovery of the Headington Wick site in 1850 (Jewitt, 1851). After 1850, there were chance finds of which the most important was at Sandford in 1874. This site was excavated by Professor Rolleston who found four kilns and recovered a large quantity of pottery (Rolleston, 1884, 937-8) which was partly published fifty years later by Thomas May (May, 1922). By the end of the century such discoveries had made it clear that a considerable pottery industry, centred on the road from Alchester to Dorchester-on-Thames, had existed on the high ground now covered by the eastern suburbs of modern Oxford (Fig. 1).

Between the two wars further discoveries gave opportunities for the first controlled excavations of sites in this area, at Rose Hill, Cowley (Harden, 1936) and at Between Towns Road, Cowley (Atkinson, 1941). In 1935, gravel extraction north of Dorchester showed that kiln sites existed to the south of the main group east of Oxford (Harden, 1936). More recent discoveries have shown the wide extent of both these groups, and also the existence of other concentrations of sites on Boar's Hill across the river from the east Oxford complex and north-west of Oxford on the riverine gravel terraces at Cassington (Atkinson, 1948, 66) and at Hanborough (Case and Sturdy, 1960, 133).

At present, nearly thirty kiln sites are known from chance finds and from excavation. It is certain that others remain to be discovered or have already been destroyed, for example in the Headlington area, known to be prolific in kilns, which has been heavily quarried since the fourteenth century. By examination of material from these sites, it is possible to date some of them and so obtain some idea of the nature and speed of the growth of the industry. From such evidence, it is clear that the sites at Cassington and Hanborough are the earliest, dating to the mid-first century A.D. or slightly earlier. They seem to have no direct connection with the main Oxford pottery industry, lying well outside the main area of activity and apparently ceasing to function half a century before the earliest kiln in that area.

This site is that of Overdale, Boar's Hill (Kirk, 1953). The pottery from here has close parallels in a Flavian well-group at Dorchester,[2] suggesting that the site began operations in the late first century. On the Oxfordshire bank, the industry developed a little later. Sites at Dorchester, Sandford, Littlemore and Blackbird Leys all produced mortaria and coarse wares in the second century A.D., and work seems to have begun

[1] Professor S. S. Frere and Mr. P. R. L. Brown read an early version of this paper and made many helpful comments. For permission to illustrate material I would like to thank the authorities of the Newport Museum (Fig. 4, 34-5, Northampton Museum and Art Gallery (Fig. 2, 12), the Oxford Archaeological Excavation Committee (Fig. 3, 21-2) and the Ashmolean Museum, Oxford (the remaining vessels). I owe much to Mr. P. D. C. Brown, of the Ashmolean Museum, for his unfailing assistance and tolerance.

[2] I am indebted to Professor Frere for information on this point.

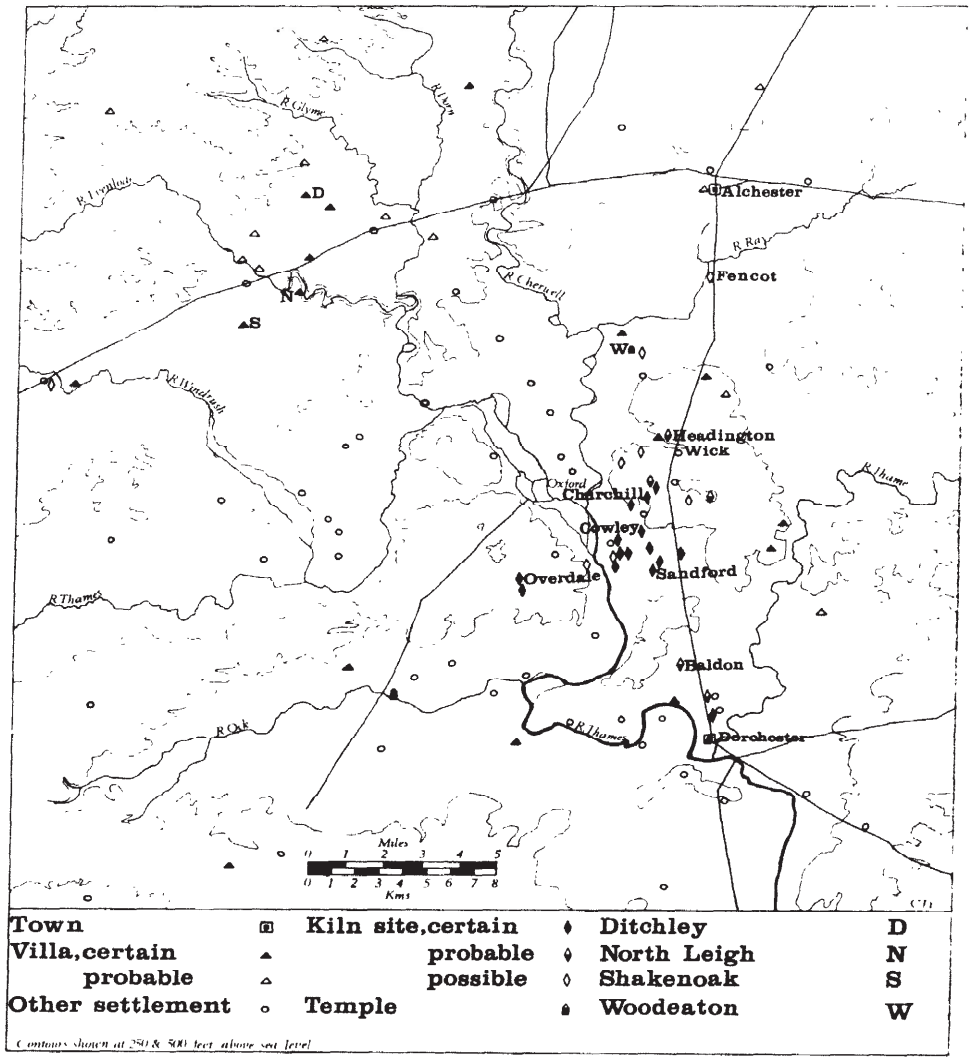


FIG. 1. Roman Sites in the Oxford Region.

in this area in the first or second decade of that century. Towards the end of the third century A.D., the kiln sites expanded into the Headington area, where none of the known sites show signs of pottery manufacture before the middle of the century, and also into the area north of Dorchester where a site at Baldon can be dated to the late third or fourth century A.D.

The reasons for the industry's early growth are clear; those for its later expansion are not so apparent. In the late Iron Age, the upper Thames basin was an area of dense settlement (Harding, 1972, pl. ix). After the Roman conquest, the intensity of habitation on the river gravels increased and was augmented by the development of numerous

villas, particularly in the foothills of the Cotswolds, and by the foundation of towns at Alchester and Dorchester, linked by a road which had the effect of opening up for exploitation an area not hitherto much occupied. It was only to be expected that a pottery industry of some sort should develop locally to supply the ceramic needs of this population, as happened all over the lowland zone in the Roman period. It is likely that the Cassington and Hanborough kilns were an early example of this phenomenon but failed for some reason, perhaps because they were not close enough to adequate clay sources.

The slightly later kilns around the site of Oxford and further south were more successful as suppliers of local demand. Despite a common cause, the industry developed very differently on the opposite banks of the river. West of the Thames sites such as those on Boar's Hill produced mainly cooking-pots and the like, while the kilns on the Oxford bank were from the outset more ambitious, producing mortaria and other relatively sophisticated vessels such as flagons. Potters at these sites were also attempting to copy samian forms (May, 1922, Fig. 1, 1, 3), samian moulded decoration (Young, 1971) and even red colour-coated wares (Frere, 1962, 129) though not with any noticeable success in the two latter instances. This ambitious range of products was probably the attempt of an ambitious potter to exploit and encourage an increasing market for romanized wares in the towns and villas of the area. Even at this stage, some Oxford wares were getting as far as Gloucester, Verulamium and London, but the quantities found outside the region are not large enough to suggest any large-scale trade.

In the latter part of the third century A.D. there was a radical change in the nature of the Oxford industry. Parchment and colour-coated wares were added to the potters' repertoire and new mortarium types were introduced. At the same time, a division between the northern and southern parts of the potting area became more distinct. The northern kilns concentrated on white wares while the more southerly ones ceased to produce white wares and turned much of their output to colour-coated wares. This was probably because the only abundant source of white clay, on Shotover Hill, lay in the centre of the northern group of kilns.

This changeover to new wares and fabrics was complete and rapid. The earliest reported example of these typical late Oxford wares is an imitation Form 38 red colour-coated bowl which was found in an early third-century deposit and was believed by its excavator to be intrusive (Boon, 1969, Fig. 13, 106). Apart from this, the earliest dated colour-coated and parchment wares in the Oxford region are those found at the Shakenoak villa in a deposit dated to the second half of the third century (Brodribb, Hands and Walker, 1971, 85-92). There is no evidence for their earlier use in the upper Thames valley. At about the same time, Oxford wares came into use over wide areas of southern Britain. By the third quarter of the third century A.D., red colour-coated bowls had reached Canterbury (Frere, 1970, 107-08); by the end of the century they were present in Gloucester (Hunter, 1963, Figs. 10-11) and had reached Gatcombe in the last quarter of the century (Cunliffe, 1967, 144, Nos. 106-11). Similar dating applies also to the introduction and spread of parchment ware and the new mortarium types, and it seems clear that the introduction of the new products and their widespread distribution were part of the same process.

The third century A.D. was a period of great change for the pottery industry, as for so many aspects of Roman life. The rapid decline of the samian export trade to Britain and of certain of the major mortarium factories early in the century left ample opportunity for the growth of alternative centres of production to supply both mortaria and bowls. The late Oxford wares were obviously designed to capture this market and in this context the Oxford industry is one of several that either appeared or adapted

themselves to supply the demand for fine tableware and mortars. Two features of the Oxford industry's expansion are particularly notable. The first, already mentioned, is the speed with which the Oxford industry achieved a major position. Secondly, it is notable that the potters concentrated chiefly on those vessel types, and in particular on fine tablewares, which were not already being successfully marketed by other pottery industries.

In physical terms, the Oxford potters were well situated for such an expansion since they had abundant raw materials and also possessed excellent communications. Neither the Cotswolds, the Berkshire Downs or the Chilterns provided any real barrier to travel, and in the Romano-British period the area was traversed by an excellent road-system linking the potters' zone with the nearest major towns, Verulamium, Corinium and Calleva, which would have provided the first major markets outside the Oxford region itself. The Thames must have formed an easy and cheap route to London and the east, although the total distribution of late Oxford wares shows that the potters were not dependent on the cheapness of water transport for their success.

However, good communications and sources of raw materials are not sufficient to explain the sudden growth of the Oxford industry. The vast production of new types and fabrics must have necessitated a radical redirection of existing manufacturing capacity and also the setting up of new workshops; both these features can be traced. All the existing kiln sites produced large quantities of the new types and, as mentioned above, new sites were established at about this time in the Headington area and to the north of Dorchester.

Such expansion and innovation would seem to require both sufficient organization to market the wares successfully in great quantities over long distances and also adequate capital to carry the initial cost of the venture and underwrite the success of the change-over and the establishment of new potteries. It is difficult to see how either could have been forthcoming so rapidly from potters producing on a relatively small scale for local consumption, who would have been unlikely to possess the capital required for such an expansionist venture. It seems more likely that some outside person or persons, realizing the demand for fine tablewares and mortaria, saw in the Oxford region an ideal area in which to develop an existing industry into something much larger.

Such an external stimulus could have come from a number of sources. An influx of potters from the Rhineland is one possibility since many of the colour-coated products of the Oxford potteries are similar to those of the East Gaulish samian industry. This is true as far as the forms of the vessels are concerned but many common East Gaulish techniques are completely unknown in the Oxford region. The moulded decoration of Form 37 was replaced by painted, rouletted and rosette-stamped decoration, the barbotine leaves of Form 36 were copied in white paint. Such features of the Oxford products seem to suggest that the local potters were copying a model, but using their own techniques.

It is more probable that the stimulus came from an entrepreneur or group of entrepreneurs who used the existing industry as a basis for expansion, probably by commissioning the potters to make certain wares and guaranteeing to purchase them. In this way, the potters themselves would have run little risk and the middle-men would, presumably, have had sufficient backing to carry the risks of establishing such long-distance trade. Such an arrangement would have produced a patron-client relationship between entrepreneurs and potters. Such entrepreneurs could have been either merchants or local landowners, who must by the fact of their ownership of the land already have been involved in the industry at least to the extent of provision of wood,

clay and other facilities to the potters, and possibly to the extent of actual ownership of the potting industry.

The concept of a central organization controlling the industry does not mean that production was organized in vast factory units. Evidence of the layout of kiln sites is scanty since so few have been excavated on a sufficiently large scale, but at the Churchill Hospital site, the workshops seem to have been quite small, with perhaps one or two buildings and a few kilns (Young, 1972). A similar arrangement seems to have existed at Cowley (Atkinson, 1941) and at Rose Hill (Harden, 1936), where the potters seem to have mixed their dwellings among their kilns, and it seems possible to suggest that the production units were quite small though it is possible that one man could have owned many of them.

Discussion so far has concentrated on the development of the Oxford industry and little has been said about the types and appearance of the products. Here discussion will be limited to those categories of pottery—mortaria, parchment ware and colour-coated ware—likely to be found outside the Oxford region. Of the three wares, only the mortaria were made before the mid-third century A.D., and before this date they were not widely traded in any quantity. The fabric used for these vessels was sandy and fairly fine, normally firing white or cream in colour, but quite often found with a pink or orange core. Exceptionally, whole vessels were orange in colour and late products of the kilns sometimes had an orange wash. The gritting used in all types of Oxford mortaria is highly distinctive, being multi-coloured translucent quartzite. Normally the grits are rounded and not very angular.

Mortarium production began in the early second century A.D., and the earliest forms are typical of that period, having a rolled-over rim with an internal bead (Fig. 2, 1). Later in the century the bead became the highest point on the rim and the rim itself could become either thinner or more stubby (Fig. 2, 2-3). Stamps are sometimes found on mortaria of these types. Forms made in the later second and early third centuries A.D. included vessels with sharply depressed flanges (Fig. 2, 4) and wall-sided types (Fig. 2, 5). The dating of their introduction is difficult since so few Oxford mortaria of this period have been found in securely dated contexts.

Excavations at the Churchill Hospital have shown that in the second half of the third century A.D. two main types of mortaria were in production (Young, 1972). The first of these has a heavy bead-rim and a flange which was hooked under itself and could be either rounded or sharply angular in shape. The spout of this type was formed by turning the bead-rim out over the flange (Fig. 2, 6-7). This type does not seem to have been current after about A.D. 300 and thereafter the only type of Oxford white-ware mortarium produced was the second type found at the Churchill. This has a more or less stubby flange, sometimes almost square, sometimes elongated, and a small bead-rim which was merely pressed down onto the flange by the potter's thumb to form a spout (Fig. 2, 8-11). The numerous variations of this type have no chronological significance, It was not produced before about the middle of the third century A.D.

The fabric of parchment ware is similar to that of the mortaria, being fine, sandy and white, though sometimes firing with a pink or orange tinge. The distinctive features of this ware are its smoothed surface, often having the colour of parchment, and its red-painted decoration. The most common vessel-form of this ware was a wall-sided bowl with a projecting moulded rim and a moulded carination. This type of bowl was normally painted red on rim and carination, and sometimes on the wall, on the exterior, while the interior base of the vessel was painted in red with patterns based on circles, crosses, scrolls and other similar motifs (Fig. 3, 21). This form was by far the most

common, comprising the vast bulk of parchment ware production. The only other vessel produced in any quantity was a small globular jar with painted red bands on its rim and wall (Fig. 3, 22). Other forms are rare and include a variety of platters (Fig. 3, 23-4) and other shallow dishes.

The third and best known category of Oxford wares comprises the colour-coated vessels made in the central and southern parts of the potting zone. The fabric of this ware is sandy, often micaceous, and sometimes contains small red or black inclusions. In colour, it is red or orange, frequently with a grey core. Both white and red colour-coats were used, the latter varying in shade from orange to brown and frequently being very micaceous. The white colour-coat was used for copies of the white ware mortaria (Fig. 2, 12) and parchment ware bowls produced at the more northerly kilns. It was very rarely used for other vessels.

The range of red colour-coated forms was wide, including bowls, mortaria and, to a lesser extent, enclosed vessels. The most frequently occurring bowl forms were copies of Form 31 R (Fig. 4, 28), Form 38 (Fig. 4, 30), a variety of deep bowls derived from or directly copying Form 37 (Fig. 4, 31-3) and necked bowls (Fig. 4, 34-5). Also made were copies of Form 36 (Fig. 4, 29). Rarer forms included dog bowls (Fig. 4, 36), pie dishes (Fig. 4, 37), very shallow bowls or platters (Fig. 4, 38-40) and a number of ornate and complex varieties of the common forms.

Various forms of decoration were used on these bowls, in some cases derived directly from the original samian form. The imitation Form 31R frequently had a rouletted circle on the interior and sometimes had a potter's stamp, usually illiterate. The barbotine decoration of Form 36 was reproduced in a white painted scroll-and-dot pattern and this technique was also applied to the Form 38 copies. The deeper bowl forms were decorated with white painted patterns, rouletted bands, or with rosette or demi-rosette stamps used either singly or in vertical or horizontal rows. Dimples and bosses were used occasionally.

Two forms of mortarium were made. One had an angular flange, frequently rouletted, with an upstanding rim, sometimes grooved or bent outwards (Fig. 2, 13-18). The spout was formed by the same method as was used on the fourth-century A.D. white ware mortaria. The other form was a copy of Form 45. This type was sometimes rouletted at the top and bottom of its wall and is also found with painted patterns on its sides (Fig. 2, 19-20). Occasional attempts were made to copy the spout of the samian original by use either of a projecting boss, often modelled into a human or animal mask, or of a painted face on the wall of the vessel. It is very rare for these 'spouts' to have a hole passing through them.

The most common enclosed vessel was the bulbous beaker with a conical neck (Fig. 3, 25) but thumb pots and folded beakers were also made (Fig. 3, 26-7). The potters also produced flagons, including some with moulded face-masks. The bulbous beakers were frequently decorated with white paint, with red or white barbotine, generally in scroll-and-dot or other linear patterns, with rouletting, often over large parts of the body of the pot, and with rosette stamping. Often two or more techniques were used on the same vessel. Occasional attempts to produce barbotine hunting scenes have been found on these beakers.

The accurate dating of all these types presents difficulties. It is clear that all came into production at or shortly after the middle of the third century A.D., as has been discussed above, but it has not yet been possible to detect any certain typological development of the various forms after their introduction. This is partly because so few sites produce sequences of stratified deposits of fourth-century date, but even on those

sites that do so it is difficult to detect any change. It seems likely that there was little development once the potters had established a repertoire of readily marketable forms.

The marked and sustained expansion of the Oxford potteries in the late third century A.D. has already been discussed, and it is now necessary to examine the extent of their success by a discussion of the resulting trading pattern. Distribution of the products is the aspect of the industry on which most work remains to be done but sufficient has been achieved, either by personal examination of museum collections or from information kindly given by others[3] or from published sources to suggest the nature of the trading pattern of the Oxford potters.

Around the kilns is an area, covering Oxfordshire and large parts of Berkshire and Buckinghamshire, which is virtually saturated with Oxford wares so that they are found on nearly every site of the late Romano-British period, regardless of its nature. Outside this is an area where Oxford wares are normally found in fair quantity on town sites and on rural romanized sites. This zone is very large, covering the Severn valley, Somerset, much of Wales, an indeterminate area of the south Midlands, East Anglia, Essex, south-eastern and south central England. Beyond this, and of course not divided from it by a sharply defined border, is a third zone in which Oxford wares occur irregularly and infrequently. Such stray finds have been made in northern England, for example, at Brough-on-Humber (Wacher, 1969, Fig. 76, 682, 685-6), and extend as far as Scotland where Oxford ware has been found at Traprain Law[4] and at Keil Cave, Argyll, on the Kintyre peninsula.

Such a pattern is fairly typical for any such industry in antiquity and was obviously the result of consumer resistance when transport costs, directly controlled by the distance covered, became too high for the price of the article to be competitive. Thus, immediately around the kilns was an area where costs of transport were negligible and the potters could flood the market. The middle zone beyond this represents a situation at which costs were still low enough for the wares to be competitively priced, while the stray finds come from the area too far away from the upper Thames valley to be effectively penetrated by the Oxford potters. The exact extent of this middle zone depended not only on the distance to be covered between manufacturer and customer but also on the availability or non-availability of similar wares from other sources, and on the possible use of cheaper routes of transport such as rivers, since water transport of bulky commodities was much cheaper than land transport. In fact, the Oxford kilns do not seem to have been much affected by the availability or non-availability of water routes since the distribution is as strong in areas not reachable by river as in those that were.

The controlling factors of the distribution of Oxford wares were therefore the general level of demand for such products and the location and success of other centres producing such wares. The relationship of the distribution patterns of such industries thus provides a useful indicator of their success or failure compared to one another. Apart from the major industries of the Nene valley, the New Forest and the Midlands mortaria factories, a number of other centres in southern Britain produced wares that in one way or another competed directly with those of the Oxford region. Often, it is possible to identify these only by their products as their kilns have not been found; so far it has been possible to identify a centre producing colour-coated ware somewhere in Sussex,[5] a possible source of flint-gritted red colour-coated mortaria in East Anglia, the colour-coated kiln at Pakenham in Suffolk (Smedley and Owles, 1961), an industry distributing its wares in Essex and Hertfordshire which produced copies of Form 36,[6]

[3] I wish to thank Mrs. V. Swan and Mr. M. Fulford for their help.
[4] Information from Mr. B. R. Hartley.
[5] Information from Mr. M. Fulford.
[6] Mr. W. Rodwell has given valuable assistance on this point.

and a source of colour-coated beakers somewhere in Gloucestershire. All these must be borne in mind when considering the extent of the success of the Oxford industry.

The distribution pattern of the Oxford wares seems to show less deep penetration to the north than to the south. This was probably the result of competition from the Nene valley and from Hartshill-Mancetter. It is noticeable at Leicester, for example, that the only Oxford wares present in any quantity, the red colour-coated bowls, are precisely those wares not produced in quantity at the other centres. In contrast, Oxfordshire mortaria are not common but those of the Nene valley and Hartshill are. Here, obviously, the competition would only allow selective success to the Oxford wares.

It was to the south that the most complete conflict between industries might be expected since the New Forest industry was producing a range of forms very close to that of the Oxford potters, Here the New Forest wares were confined to the area of Dorset, Hampshire and southern Wiltshire, with the exception of the purple beakers with which the Oxford region did not directly compete. Moreover, Oxford wares are very common in much of this area, despite its closeness to the New Forest kilns, and it is clear that in some way the Oxford potters were able to outsell the New Forest potters on their own territory.[7]

No other kiln centre was in such direct competition with the Oxford potters and elsewhere within the main distribution area of the Oxford wares there are only a few very small areas where they did not penetrate in quantity, although it is possible that further work may reveal other such *lacunae.* It seems clear from this that the Oxford potters achieved a very considerable domination of the market over large areas and that in some way they must have kept their costs down enough to enable them to do this. It is difficult, at this stage, to see by what means they were able to lower their prices in this way, but it is likely that part of the answer may have lain in superior workmanship and finish combined with efficiency of production and marketing.

The dominant position of the Oxford industry seems to have continued into the early fifth century. The evidence for the end of the industry is scanty for there are few deposits of that period which contain Oxford wares. Some indication may be supplied by evidence from Shakenoak where Oxford ware was common in the first quarter of the fifth century A.D. (Brodribb, Hands and Walker, 1968, 26-7) while mid-fifth century A.D. deposits were completely void of it (Brodribb, Hands and Walker, 1972, 24). If this is truly indicative, it suggests that production of Oxford wares ceased at some point in the first or second quarter of the century. There is no evidence for survival of any sort after that date. Such a total collapse might result from the disruption of long-distance trade routes since the Oxford region must by that date have been dependent on a very large market. It is also possible that the very early Saxon settlements in the Thames valley may have had some effect on the industry.

[7] Mrs. V. Swan has given much help over this aspect of the distribution of Oxford wares.

SUMMARY

This paper is an interim survey of work on the development and significance of the Oxford pottery industry. This developed in the late first century in response to local demand. In the mid-to-late third century this rapidly developed into one of the major sources of pottery in Britain, possibly as the result of external intervention. Some of the major products of the late period (mortaria, parchment and red colour-coated wares) are illustrated and discussed. The distribution of the pottery is discussed in an attempt to estimate the success of the industry in relation to other similar industries. The potteries seem to have ended fairly suddenly in the early fifth century.

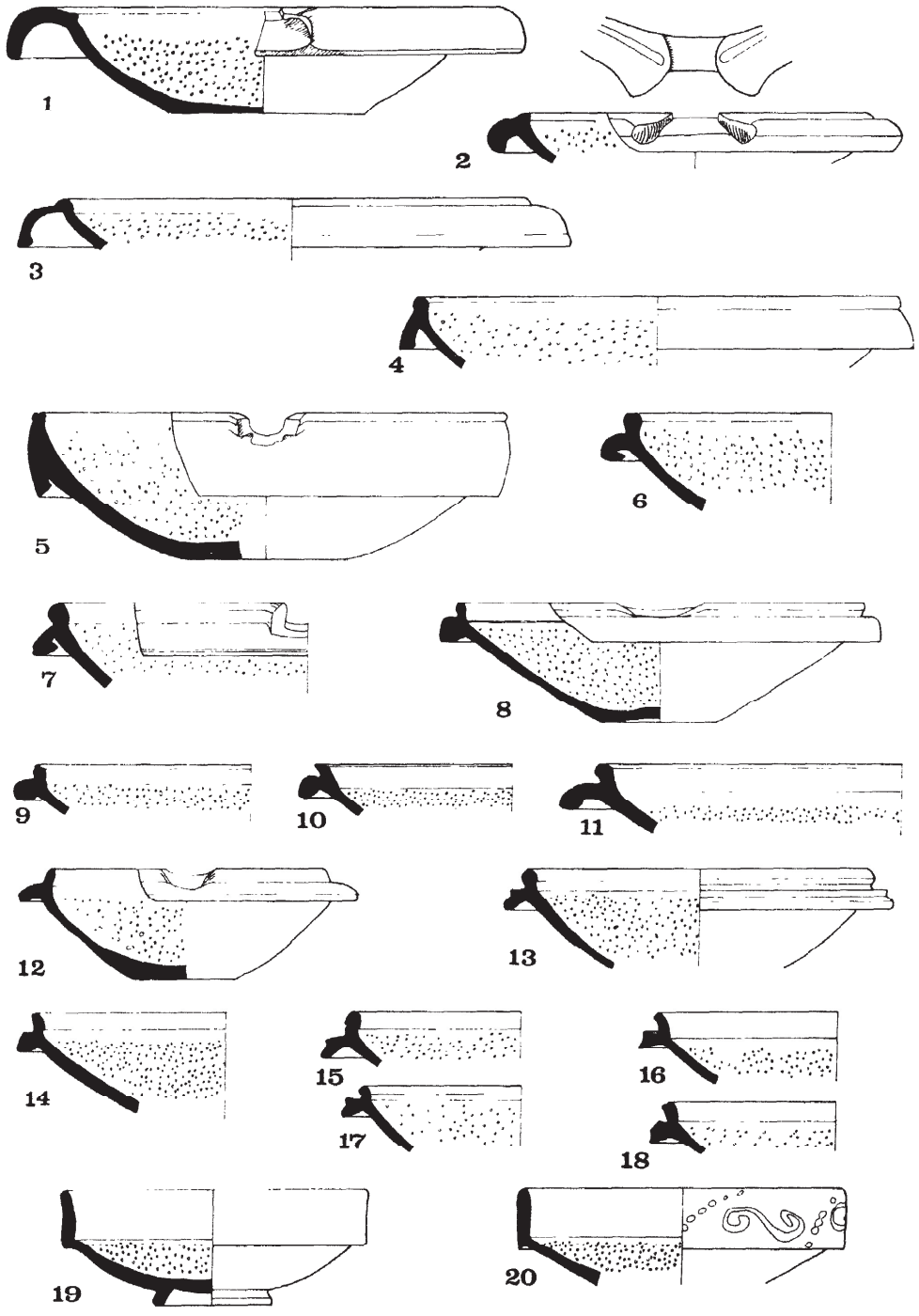


FIG. 2. Oxford Mortaria: 1-11 white Ware; 12 white colour-coated Ware; 13-20 red colour-coated Ware (¼).

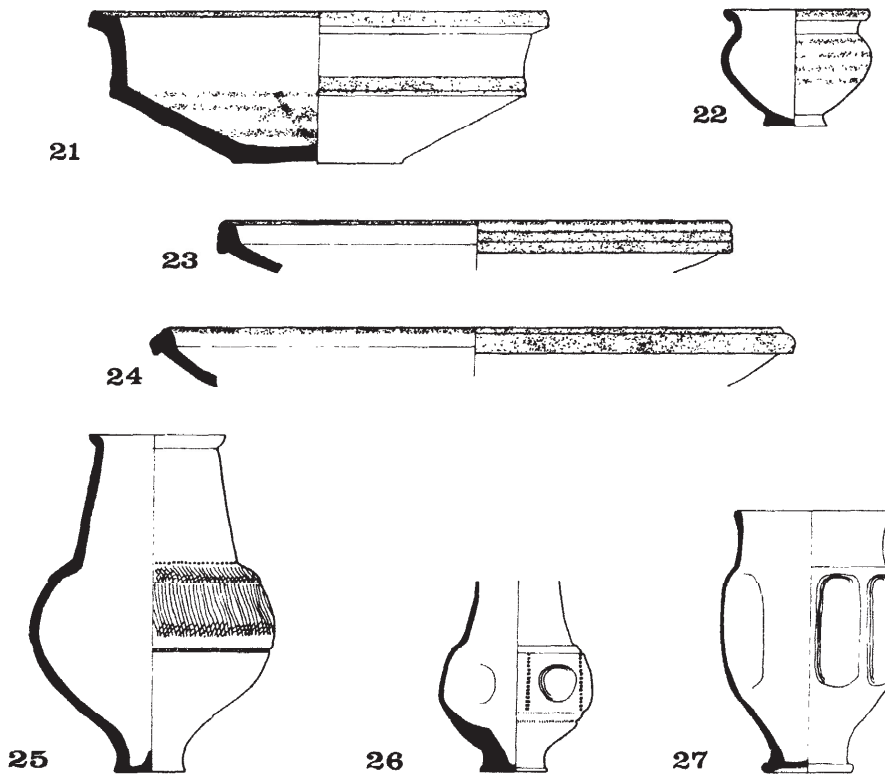


FIG. 3. Oxford Pottery: 21-24 Parchment Ware; 25-27 red colour-coated Ware (¼).

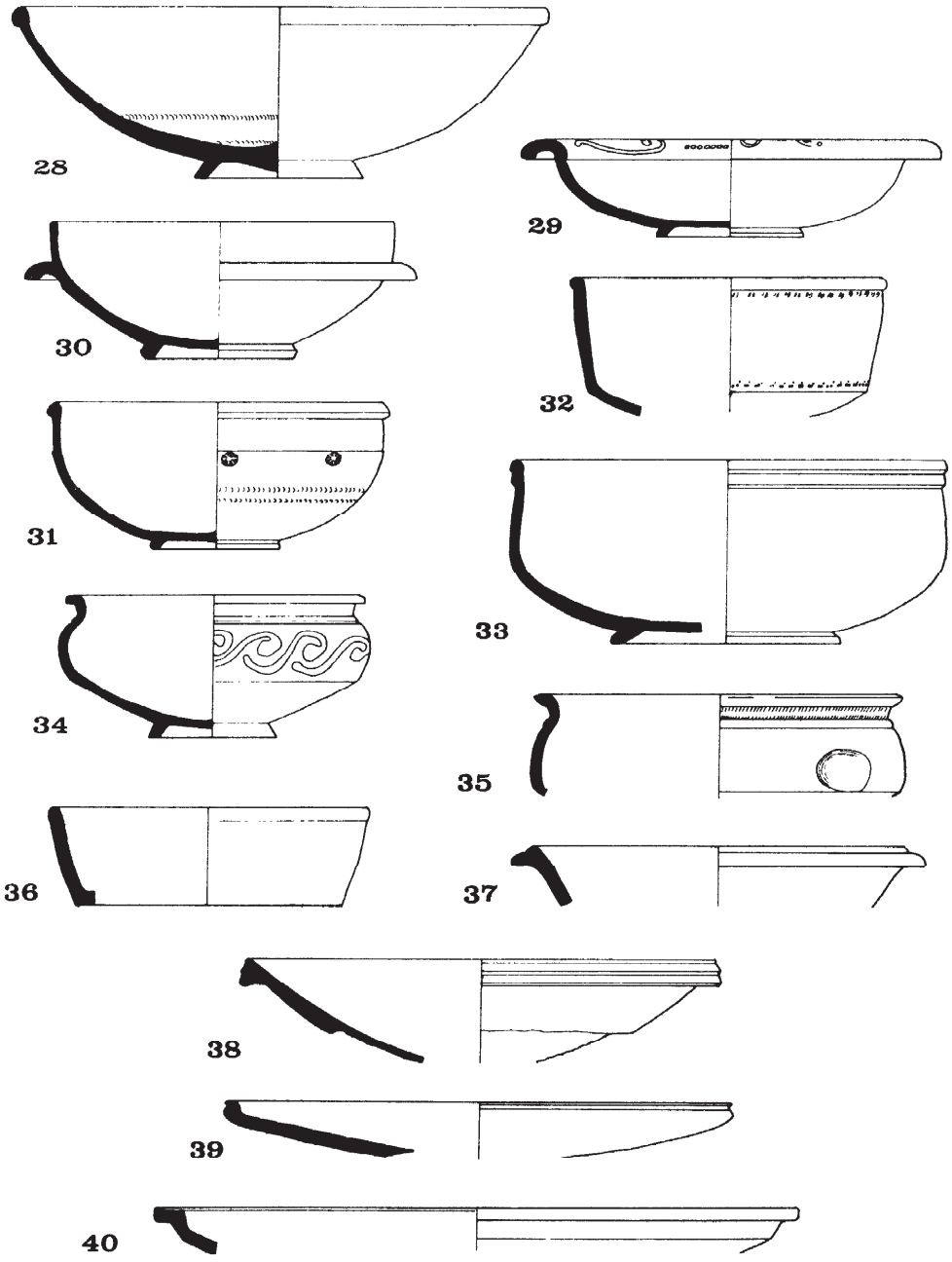


FIG. 4. Oxford Pottery: red colour-coated Ware (¼).

ASPECTS OF THE NEW FOREST LATE-ROMAN POTTERY INDUSTRY

VIVIEN SWAN

The New Forest kiln complex lies to the east of the Hampshire Avon and consists of a tract of gently sloping land crossed by three tributaries, Ditchend Brook, Latchmore Brook and Dockens Water (Fig. l).[1] Geologically, much of the area is composed of alluvially deposited Bracklesham and Bagshot Beds, which, though agriculturally infertile, contain varying quantities of clay and sand, and thus provided some of the basic ingredients for a flourishing Romano-British pottery industry.

Research has been carried out for more than a century; initially, in the 1850s by the Rev. J. Pemberton Bartlett at Crock Hill and Islands Thorns Enclosure (Akerman, 1853) and subsequently at Anderwood, Sloden Inclosure, and Pitt's Wood Inclosure (Bartlett, 1873). His contemporary John Wise followed with the investigation of further kiln sites at Crock Hill and Pitt's Wood, and also at Anderwood, Oakley Inclosure, Lower Hat, Ashley Rails, and Black Heath Meadow, Linwood (Wise, 1863, 215-25; Bartlett, 1873, 323). Some of the material amassed by these and other collectors ultimately passed to the Ashmolean Museum, Oxford, the British Museum, and Salisbury and Winchester Museums.

But the attention of these early excavators was concentrated on obtaining good specimens of the finer and decorated New Forest wares, and it was not until about 1917, that a local antiquary, by the name of Heywood Sumner, began to make a serious study of the kiln structures themselves. After a series of excavations, most notably at Sloden, Linwood and Islands Thorns, and also at Ashley Rails (Pitt's Wood) and Crock Hill, he published his results in that now familiar little book *Excavations in New Forest Roman Pottery Sites* (Sumner, 1927), and thus laid the basis for our present knowledge of the New Forest industry, not only of the fine wares, but also of the coarse wares and the kilns themselves. Subsequent work has been carried out by the late Miss E. M. Collinson in 1955 on kilns at Clonmore (Linwood North), and Crock Hill kiln VII (Cunliffe, 1965), by the author in 1966 at Pitt's Wood and Lower Sloden (M.P.B.&W., 1967, 10; Wilson, 1968, Pl. XVI (2)) and in 1969 at Rough Piece, Linwood (M.P.B.&W., 1970, 17), and by Mr. M. Fulford in 1970 at Amberwood (D.O.E., 1971, 63).

The recent research has more or less resolved the problems of the kiln structures. Sumner's interpretations and drawings had always raised difficulties, particularly as they purported to show a kiln type unique in Roman Britain, whose features included a separate 'chimney' leading directly out of the furnace chamber to the exterior, and, around the furnace chamber, a clay 'platform' surrounded by a 'ramp'. However, the re-excavation of Sumner's kiln at Rough Piece, Linwood, in 1969, and following it, a re-interpretation of Sumner's drawings of other kilns, make it clear that the kiln type characteristic of the New Forest industry did not possess these supposed features, but was one in which pilasters (mere thickenings of the kiln wall) supported a permanent vent-holed clay oven floor, through which hot air passed from the combustion chamber

[1] Thanks are due to Mr. A. L. Pope of R.C.H.M.(Eng.), for drawing the maps (Figs. l-5) and to Mr. N. Grifiths (Winchester Research Unit) for Fig. 6, nos. 8 and 13, Fig. 7, no. 1 and Fig. 8, nos. 12, and 17-20.

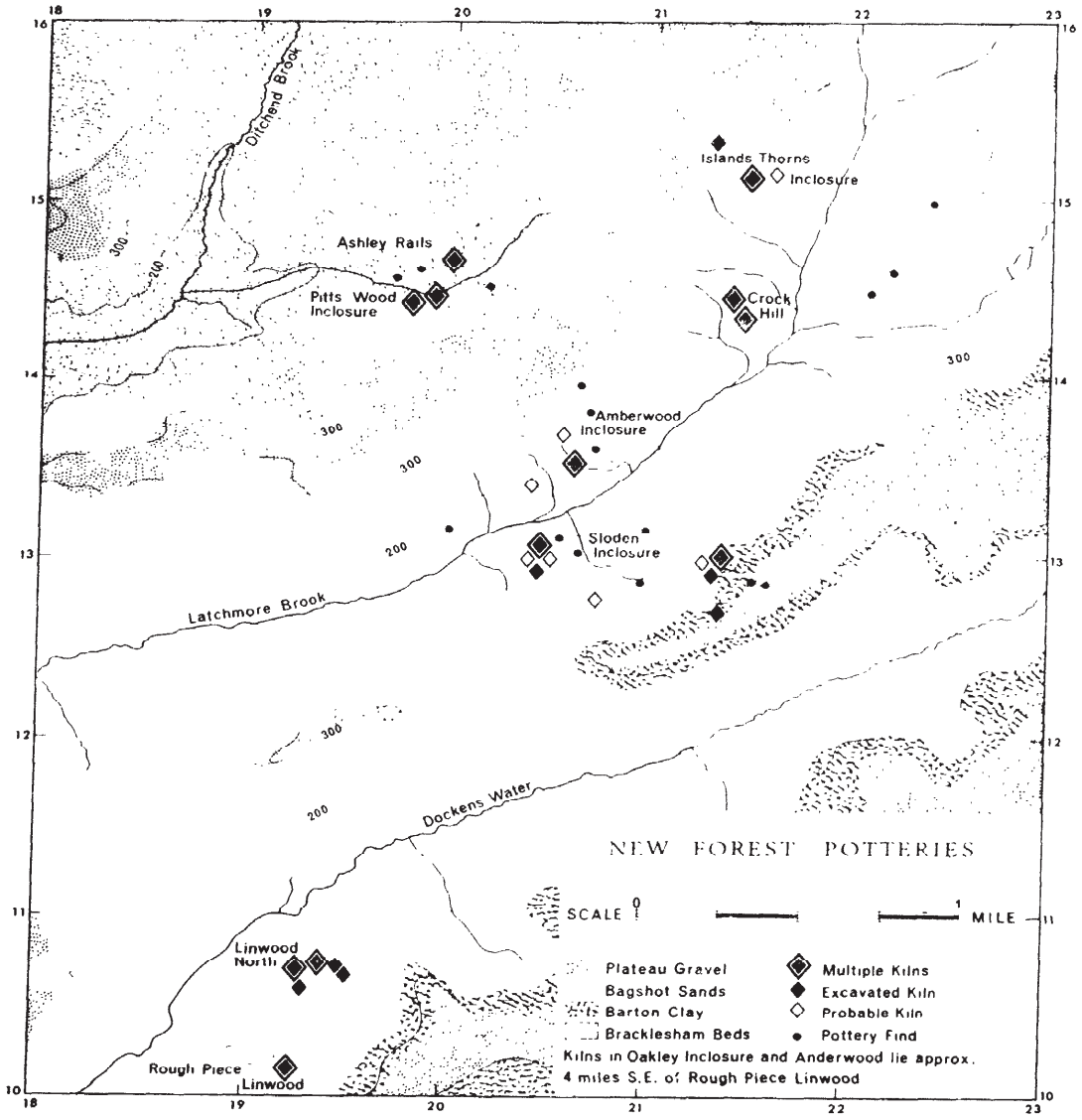


FIG. 1. The Geographical Setting of the Industry.

(Swan, 1971). It is of interest, that contrary to the situation at most Romano-British potteries producing colour-coated wares, none of the New Forest kilns appears to have had any additional oven floor-support, by way of pedestal or tongue.

The New Forest production centres manufactured a wide range of pottery, and perhaps one of the most obvious ways to approach its study is to divide it for easy reference into four groups of products, of which the fabrics and vessel types jointly form the basis of the classification.

Group I comprises what may be conveniently called the 'late imitation samian ware', or 'pseudo-samian', since vessels in this group imitated in form, finish and decoration, the latest (mainly East Gaulish) samian to arrive in Britain, or the colour-coated wares which evolved from it in the Rhineland. The fabric, normally oxydized, and utilizing comparatively iron-free clays, varies from cream to buff (rarely pale orange), and was clearly very carefully refined; it feels 'chalky', with little or no coarse tempering, and in contrast to most other New Forest wares, is normally fired only medium hard; the brownish-orange, semi-matt slip rarely adheres well to the body of the vessel. In common with the Oxford potteries, the following forms were particularly popular—Form 38 (Fig. 6, no. 2), a carinated bowl (Fig. 6, no. 4), a flanged mortarium (Fig. 6, nos. 7 and 15) and to a lesser extent Forms 18/31 or 31 (Fig. 6, no. 1), Form 36 (Fig. 6, nos. 8 and 9) Form 37 (Fig. 6, no. 10), and the mortarium Form 45 (Fig. 6, no. 14). However, in addition, imitations of Form 33 (Fig. 6, no. 12) and a variant (Fig. 6, no. 3) of Ludowici Tn or Tf (Ludowici, 1905-08, 277) were also favoured by the New Forest potters.

As with late imitation samian elsewhere in Britain, the New Forest rosette, demi-rosette, and ovolo-stamped decoration was no longer by means of stamped moulds (as true samian), but was impressed directly onto the vessel itself (Fig. 6, nos. 8 and 13). Occasionally combined with stamping, but usually found on its own, is decoration in white slip-paint, applied over the colour-coat (Fig. 6, nos. 2 and 4); simple curvilinear designs predominate, presumably inspired by the barbotine motifs on samian ware proper, but dots and geometric patterns also occur. Unlike the similar Oxford products, this category of New Forest ware is rarely rouletted. Although Sumner illustrated many decorated imitation samian ware sherds (Sumner, 1927, Pls. IV, V, VI and VIII), the proper excavation and assessment of kiln groups, together with recent distributional studies make it clear that these decorated imitation samian vessels formed only a small percentage of the production of each kiln, and tend to be comparatively rare on settlement sites; in fact, plain wares were the norm.

All New Forest mortaria in both this group and Group II have trituration grits of crushed flint, and the recognition of this is an easy method of distinguishing them from their quartz-gritted Oxford equivalents. The main centres known to have produced imitation samian wares are Ashley Rails/Pitt's Wood, Crock Hill, Islands Thorns, and Lower Sloden (1966 site).

N.B. Very occasionally, forms imitating Forms 31 and 45 were made in the coarse fabric normally associated with culinary wares (Group IV); they were probably individually rather than mass-produced, and do not merit particular attention.

Group II. Like their Oxfordshire counterparts, these may be termed the 'parchment wares'. They largely comprise a range of table-vessels, particularly bowls, in pale fabrics, frequently painted internally with repetitive motifs in a darker contrasting slip; the style is characteristic of 'late painted wares'—a tradition widespread in the north-west provinces of the Roman Empire in the late third and fourth centuries, and examplified elsewhere in Britain by certain Crambeck (Gillam, 1957, Types 207, 208 and 298), Nene Valley, and Oxford products.

Two New Forest fabrics are known, of which, the first is by far the most important since it was more frequently used, and occurs in a wider range of vessels. The first fabric is very hard, extremely sandy and oxydizes to a white or off-white 'parchment' colour, implying that special iron-free clay deposits were selected for its production. Occasionally, a thin white, or self-coloured slip is visible on some of the painted wares, but the

less popular plain vessels mostly have a thin dark chocolate-brown colour coat. The very rough texture of this sandy fabric is unmistakable, and easily distinguishable from its smoother Oxford counterpart.

The second fabric in this group appears to be identical to that used for the imitation samian wares (Group I); it was also occasionally coated with a white slip.

By far the most widely distributed 'parchment ware' vessel type was a large paint-decorated bowl, with an internal projection or flange immediately inside the rim (Fig. 7, no. 10); mortaria, too, were popular (Fig. 7, nos. 11, 12 and 13), but were never colour-coated. The carinated parchment ware bowl-form manufactured in vast quantities by the Oxford potters (Young, 1972, Pl. I) is scarcely represented in the New Forest repertoire. The orange, red or dark-brown paint was normally applied internally, in the form of alternating wavy lines and stripes, dots, interleaving arcs and, less frequently, scrolls and 'fir-tree' sprays; incised decoration—in the form of wavy-lines and rows of stabbed dots was executed mostly on the mortaria (Fig. 7, no. 11). Among the kiln-complexes known to have produced parchment wares are Amberwood (1970), Ashley Rails/Pitt's Wood, Crock Hill, Islands Thorns, and Lower Sloden (1966 site).

Group III constitutes by far the most important category of New Forest pottery, since to it belongs the well-known range of fine colour-coated table-wares. Several features in common unite vessels into this group—the comparative thinness of the vessel walls, the use of a fine non-sandy fabric, the invariable presence of a colour-coat, and the frequent use of a reducing atmosphere in the kiln, at some stage during the firing. In terms of refinement and the ratio of clay to tempering, the paste may not be very different from that typical of the imitation samian wares (Group I); however, for Group III products, iron-free and iron-bearing clays seem to have been used indiscriminately; presumably, the potters prepared whatever materials they had to hand. Thus, a wide variation in body-colour is noticeable; in the case of the softer vessels, an orange, buff or cream paste with a darker surface resulted from firing under oxydizing conditions, with a final reduction; in the case of the very hard, mostly reduced wares, a fabric of blue-grey or grey with a buff surface is extremely common. The colours of the slip-coats range from matt black, brown, or red on the softer fabrics, to a lustrous purple or plum-colour on harder vessels. New Forest clays, as a rule, became non-porous at *c.* 800° C., but the very hard vessels must have been fired at temperatures exceeding 1,030° C., for they are brittle and almost vitrified like 'stoneware'.

Group III forms exhibit much variety, and include beakers, particularly the famous indented vessels, bowls, cups, flagons and jugs (Fig. 8). Miniature versions of many forms constitute a regular feature of each kiln-group; these presumably supplied the demand for grave goods or 'ritual' containers. Decoration on Group III products is frequent, but by no means universal; it includes cordons, roulettings, rows of 'stabbing', incised wavy-lines, and, above all, white slip-paint in a variety of simple motifs, mostly geometric and arranged in zones or panels. The Crock Hill kilns manufactured a remarkable range of beakers and flagons with large stamped or incised medallions of concentric circles embellished with white paint (Fig. 8, no. 23). Unrecorded in the New Forest until recent years, is the use of barbotine, mainly simple leaves and scrolls (Fig. 8, no. 19) and a variant of barbotine—applied scaly decoration (Fig. 8, no. 17). Production centres of Group III vessels have been recorded at Amberwood (1970 site), Ashley Rails/Pitt's Wood, Crock Hill, Islands Thorns, and Lower Sloden (1966 site).

Group IV includes a wide range of fairly coarse kitchen wares (Fig. 9). Atypical is

an orange or grey fabric, well tempered with sand and small quantities of burnt sandstone, grog (i.e. crushed pottery), and, sometimes flint. Vessels often show signs of having been dipped in a self-coloured or darker slip; decoration in the form of zones of burnishing or burnished lines, areas of white or black slip applied by brush, finger-nail stabbing, combing, and rough knife-trimming is well-attested. Some pots, particularly the large storage jars, were drawn up by hand. Further details need not concern us here, since the distribution of these wares is comparatively local. Virtually all the kiln-complexes producing the other wares (Groups I-III), manufactured some of these culinary forms, and in addition, the following centres specialized in them: Anderwood, Crock Hill kiln VII, Lower Hat and Oakley Inclosure, the Black Heath Meadow complex (Linwood), Clonmore, Linwood North, Rough Piece, Linwood, Lower Sloden (1920 site), Old Sloden Wood, and Sloden Inclosure kilns I and II.

Despite a long history of research on New Forest kiln sites, and the recent excavation of considerable areas in the vicinity of kilns (in Lower Sloden in 1966, and in Amberwood in 1970), little information has emerged on the technical aspects of pottery production (aside from the kilns) or the lives of the potters. Sumner published a flimsy 'potters hut' at Islands Thorns (Sumner, 1927, 101-07)—probably no more than a drying shed or store for pottery, and more recent excavations at Lower Sloden have located water or drainage channels near the kilns; a fragmentary 'quern-stone', also from Lower Sloden, may be part of a potter's kick wheel. In addition, Bartlett found bands of yellow raw clay adjacent to a kiln at Crock Hill (Akerman, 1853, 95) and Wise describes at Pitt's Wood 'two distinct heaps of white and fawn-coloured clay and red earth placed ready for mixing, and a third of the two worked together, fit for the immediate use of the potter' (Wise, 1863, 220); this, together with the instructive fabric differences in the final products, gives some hint of the high degree of organization necessary for the exploitation of the local iron-free and iron-bearing clay deposits for various purposes. The recognition in the fabrics of several elements of tempering, already mentioned, helps to explain the frequent occurrence on kiln sites, of fragments of reddened sandstone (the local heathstone) which will not crush unless it is burnt; the mass of calcined flints found in a kiln stokehole at Rough Piece, Linwood (unpublished, 1969) must also have been left there to heat so that they would fragment more readily. However, many questions remain unanswered and there is much scope both for work on the actual kiln sites and for scientific investigation into the more technical aspects of the kiln products.

The chronology of the New Forest pottery industry has been the subject of much discussion, and the schemes drawn up by Heywood Sumner (1927, 81-2) and following him, Professor Hawkes (1938) of early (A.D. 250-90), middle (A.D. 290-330), and late (A.D. 330+) periods of production, have been regularly used by many archaeologists for dating the pottery. However, such a scheme rests almost entirely on the typology of the New Forest products—the centres producing coarse wares having been judged earlier than those making the finer and more elaborate colour-coated and painted wares. Among the strongest arguments against the validity of this scheme, has been the discovery of a considerable number of sherds assignable to the 'middle' and 'late' periods, securely stratified in deposits associated with the kilns excavated in 1969 at Rough Piece, Linwood, a centre producing coarse wares only, and normally considered to be among the earliest manufacturing sites. In addition, some of the the colour-coated indented beakers, formerly considered to be exclusively fourth-century in date, are represented at Fishbourne, Hants., in an assemblage dated to the third quarter of the third century (Cunliffe, 1971, Type 367), and also occur in two probably late third-

century contexts at Winchester (Cunliffe, 1964, 69, 176-9). For the start of the industry, the imitation of black-burnished ware flanged bowl-forms is relevant, since the prototypes of these do not seem to appear prior to the middle of the third century A.D., and virtually all New Forest centres manufactured the grey ware imitations. Thus, on basis of the association of types in the kiln-groups excavated, there is little evidence to support Professor Cunliffe's suggested commencement of production as early as the late second or early third century (Cunliffe, 1965, 44-5), though there are undoubtedly conservative elements present, especially in relation to the coarser culinary wares (Fig. 9, nos. 13 and 15). Most of the latest deposits on Roman sites in Wessex contain New Forest wares, and it therefore seems reasonable to assume the kilns continued to function into the early fifth century A.D. The disparity in output from one kiln site to another is, undoubtedly, best explained in terms of differing emphases in production, rather than attributed to chronological variations. A pressing need is the excavation, publication, and proper analysis of a large number of closely-dated stratified deposits, from sites supplied by the New Forest potters: indeed, at present we can only begin by noting the presence or absence of various forms in a very limited number of such groups, from sites such as Dorchester, Portchester and Winchester.

Detailed studies of the occurrence of identical forms from other production centres may prove instructive, and a modest start on these lines has been made in connection with a small jug form (Fig. 8, no. 13); the short, proportionately wide neck of the vessel, slack shoulder profile, and weak finger-impressed spout are distinctive, and initial reaction suggests a typological development (or degeneration) from the more globular jugs with their larger narrower necks and carefully pinched pouring-lips (Fig. 8, no. 12). The example illustrated was found within the fourth-century enclosure on Rockbourne Down, Wants. (Sumner, 1914, P1. IX, No. 1) and lay adjacent to the silted-up ditch of a Bronze Age barrow. The placing of offerings near barrows is well attested in Wessex for the Romano-British period, and the jug in question (found complete) may fall into this context. Pitt Rivers (1892, P1. CLXXXVI, Fig. 2) illustrates a similar vessel of New Forest origin from one of a group of fourth-century A.D. graves at Woodyates, where it was associated with a bone comb (of probable late fourth-century form). In the cemetery at Lankhills (Winchester), one such New Forest jug occurs in a grave (No. CCLXV) with a coin of the House of Theodosius (A.D. 388-402) and another similar vessel from a burial there (Grave no. CXXXVI) is dated, by the excavator[2] (on the evidence of grave layout and an associated glass vessel) to the late fourth century, *c.* A.D. 390. Several complete examples of this same general type (but not all apparently of New Forest origin) were published by May (1916, P1. LX, Types 78 and Pl. LVI, Types 102 and 104); of these, one *(ibid.,* Type 102) from Bobs Mount, Reading—a probable late Roman cemetery—contained coins ranging from Julian II (A.D. 353-73) to Arcadius (A.D. 383-408) and another *(ibid.,* Type 104) from Silchester lay in some sort of cist. In the Rhineland, jugs of the same general form (but a little more squat) are dated to the second half of the fourth century A.D. (Gose, 1950, Types 514 and 515). Similar vessels occur regularly in association with the late fourth/early fifth century burials at Furfooz (Nenquin, 1953, Fig. 8, nos. 25-7, and Fig. 9, 31-3, 34, and 36-7), and in the fifth century cemeteries at Haillot, Belgium (Breuer and Roosens, 1957, Fig. 11, no. 2 and Fig. 17, no. l), and at Lavoye in the Argonne (Chenet, 1941, Pl. XXVII, grave no. 18l), France; numerous other parallels of similar date could be quoted from northern France and the Rhineland. The significance is clear; this par-

[2] I am grateful to the excavator Mr. Giles Clarke and to his assistant Mr. Simon Esmonde-Cleary for information on the phasing of these graves.

ticular jug type normally occurs in 'ritual' circumstances, and a date in the latter part of the fourth or early fifth century A.D. is likely; no doubt the New Forest examples fall somewhere within the same period. Indeed, the transmission of pottery fashions to Britain, from the Rhineland and adjacent areas, is not out of place, when considered in conjunction with the apparent copying (in Britain) of late-Roman metalwork current in the north-western provinces of the Empire (Hawkes and Dunning, 1961). Much detailed research is undoubtedly required on this point, and also on another outstanding problem—that of the origins of the potteries. Was the growth of the industry spontaneous, or did potters migrate to the New Forest from elsewhere?

Until very recently, the relative importance of the many varieties of New Forest vessels to the Romano-British consumer, has received little detailed discussion; still less, has the frequency of the various products on Romano-British settlements been related to the competition, which the New Forest potters faced from the rival contemporary kilns in the region of Oxford. As a sample segment immediately adjacent to the New Forest potteries, I have selected the county of Wiltshire; over this area, the complementary distributions of the products of both industries have been plotted, because a rational understanding of one is not feasible without a consideration of the other. One difficulty which besets any distributional analysis of archaeological material is the extent to which the available evidence is representative of what once existed. The maps (Figs. 2-5) include only sites from which material happens to have survived, and so, do not purport to show all sites occupied in the late third and fourth centuries A.D. in Wiltshire. In particular, Romano-British settlements on Salisbury Plain have been inaccessible to excavators and collectors of archaeological material for more than half a century, due to military activity. With these reservations, it may be claimed that the distributions plotted are as complete as possible, at present, since virtually *all* available collections of Romano-British material, both public and private have been examined.[3] Nevertheless, the distribution patterns which have emerged seem reasonably representative, by virtue of their obvious coherence.

One point apparent from Fig. 2, is the fact that the occurrence of New Forest late imitation samian ware (Group I) has been grossly overestimated in the past, probably due to the inability of excavators to distinguish it from the equivalent Oxford products. The comparative lack of success in the sale of these particular New Forest vessels, may merely reflect their inferior quality, when compared with the harder, more durable, but similar Oxford wares. Beyond the areas of its most dense distribution, New Forest imitation samian tends to appear only on sites near major roads, or in the few known towns; these, in any case, always seem to have been supplied with a wider range of pottery than rural settlement in the county.

Roman Wiltshire was a comparatively conservative area as far as pottery was concerned; for instance, apart from the extreme north, few mortaria (of any kind) dating to before the third century have been recorded. This conservatism may well be reflected in the apparent lack of any substantial demand there for the parchment wares—both New Forest and Oxford (Fig. 3); in contrast, research in the adjacent county of Hampshire suggests that these wares had a wider appeal there. The ability of the Oxford manufacturers to trade their mortaria virtually on the 'doorstep' of the New Forest potters is remarkable (Fig. 4); the quality of their vessels is not obviously superior. However, the earlier commencement of the manufacture of mortaria around Oxford,

[3] I would like to acknowledge the kindness of the staff of the Devizes Museum, the Salisbury and South Wilts. Museum, and of the many people, too numerous to name, who have so willingly shown me Roman material in their possession. Work is already well advanced on a similar survey for Hampshire.

may mean that some exploitation of potential markets had already begun before the New Forest potteries were fully operational—a factor which could have favoured the marketing of other Oxford products as well. The occurrence of a single New Forest mortarium outlying the main area of their distribution (Fig. 4), may be explained by its find spot—Nettleton Shrub on the Fosse, a religious site of exceptionally wide-ranging contacts.

There is no doubt that the most decisive illustration of the success of the New Forest kilns is the distribution of the fine colour-coated products (Group III), particularly the indented beakers (Fig. 5). Indeed, these have been recorded sporadically from sites over most of England (south of the River Thames), and in addition, occur regularly in small quantities on Romano-British settlements in the Cotswolds. Their appeal may lie partly in their attractive appearance (especially the lustrous purple colour-coat), and partly in the fact that when they were fired hard, they would have travelled well without abrading. An interesting example of the dominance of these fine wares comes from part of a Romano-British settlement excavated at Durrington—a site about 7 miles north of Sorviodunum, and easily accessible, up the River Avon, from the New Forest kiln-sites. Here, of the 97 sherds of New Forest pottery recorded (compared with 71 sherds of Oxford origin), 81 fragments belonged to Group III fine colour-coated vessels.[4]

Several general points emerge from the distribution patterns when considered together. Water transport (particularly the River Avon) was of prime importance to the New Forest potters, but less so to the manufacturers in the Oxford region. Indeed, preliminary work elsewhere in southern England, suggests that there was also a considerable coastal traffic in New Forest products; for example, a New Forest mortarium is recorded from as far east as Richborough (Hartley, 1968, 172-5). In Wiltshire, higher percentages of both New Forest and Oxford products, occur on settlements immediately adjacent to major Roman roads. Does this imply that much of the pottery was marketed by vendors travelling along the main routes? The situation may well have been dictated by the overwhelmingly rural aspect of settlement in Wiltshire during the Romano-British period.

Our visual image of the New Forest potteries has, thus, moved far from the rustic scenes depicted by Heywood Sumner. A highly industrialized organization is implied, whose mass-production was closely geared to pre-determined markets. Indeed, to suggest that something as up-to-date as 'market research' was a regular feature of the system, may well fall not far short of the truth.[5]

SUMMARY

Past work on kiln sites and revised ideas on kiln structure are summarized. A simple classification divides the wares into four groups. The old chronology is no longer valid, but a new one awaits work on archaeological sites in which the pottery is stratified. Research on the broad affinities of a small jug suggests that this approach may aid dating. Maps of pottery distributions in Wiltshire show the importance of the New Forest fine colour-coated wares and the dominance of the Oxford potteries in all other types.

[4] For further details of the incidence of other types there *see* Swan, 1971 (a), 104.

[5] I must thank the Secretary of the Royal Commission on Historical Monuments (Eng.) for granting me research leave in past years to undertake work on the New Forest pottery industry.

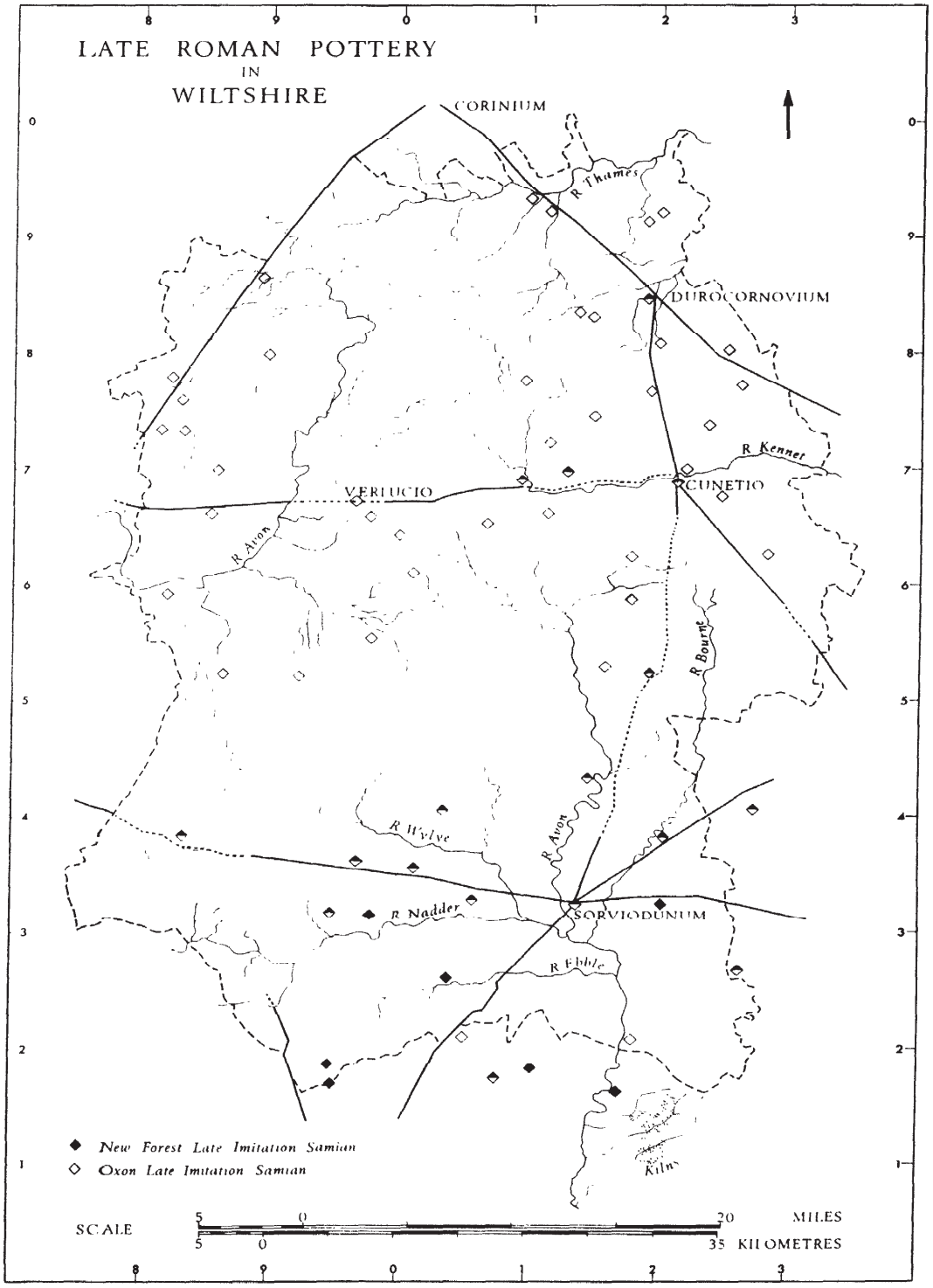


FIG. 2. Oxford red Colour-coated Wares and New Forest Group I Products (excluding Mortaria) in Wiltshire.

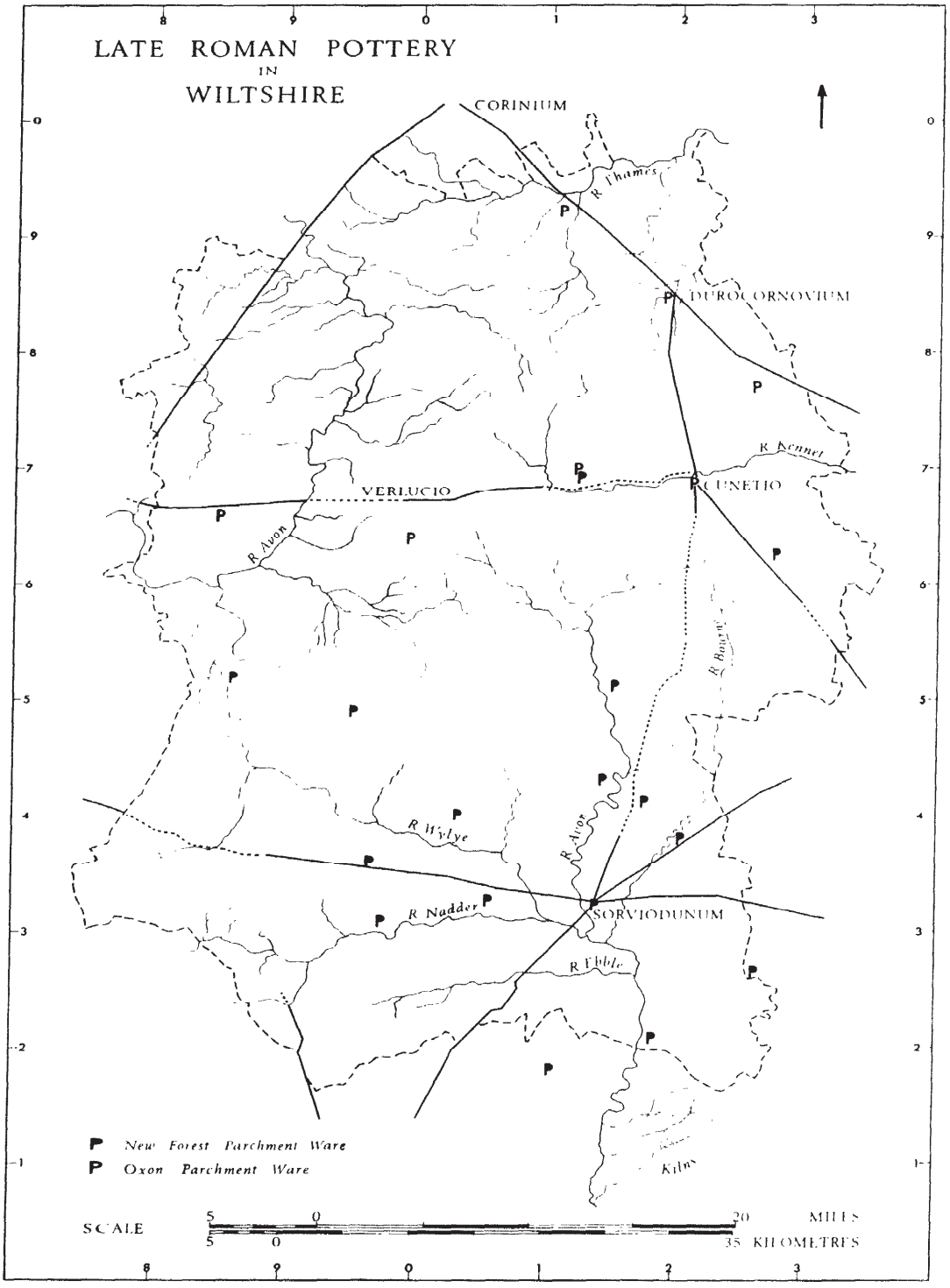


FIG. 3. New Forest and Oxford 'Parchment Wares' in Wiltshire.

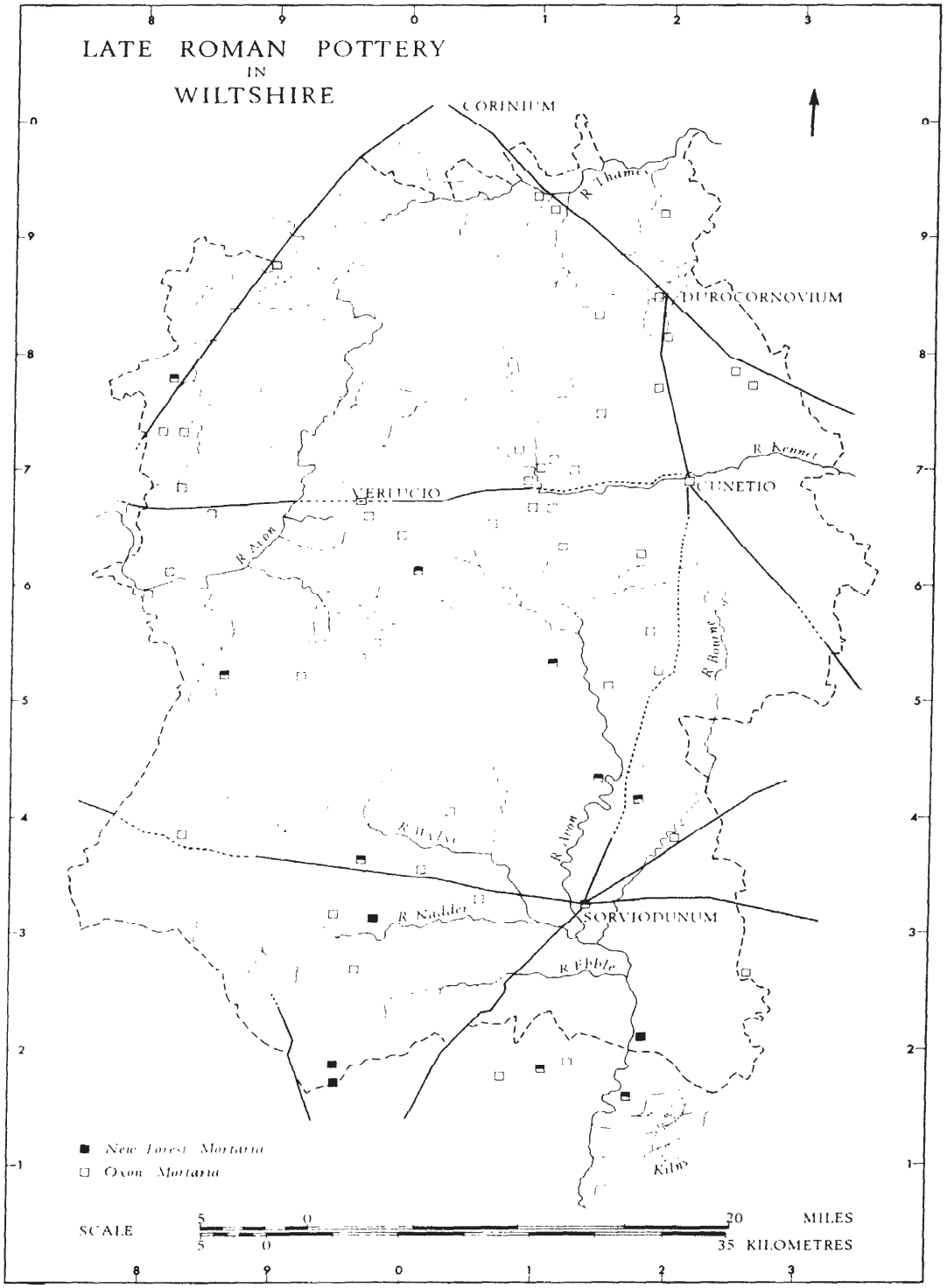


FIG. 4. New Forest and contemporary Oxford Mortaria in Wiltshire.

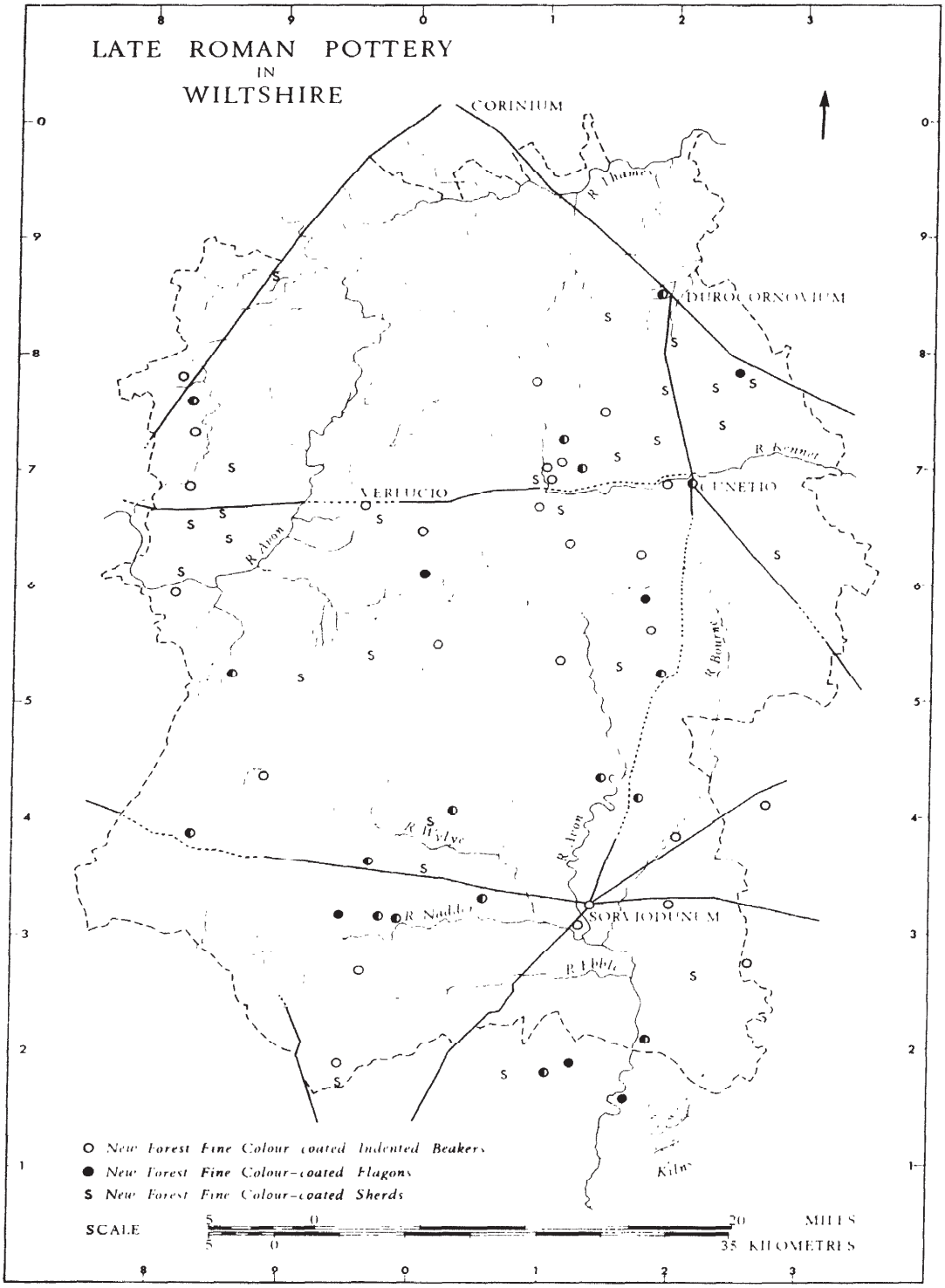


FIG. 5. New Forest Group III Products in Wiltshire.

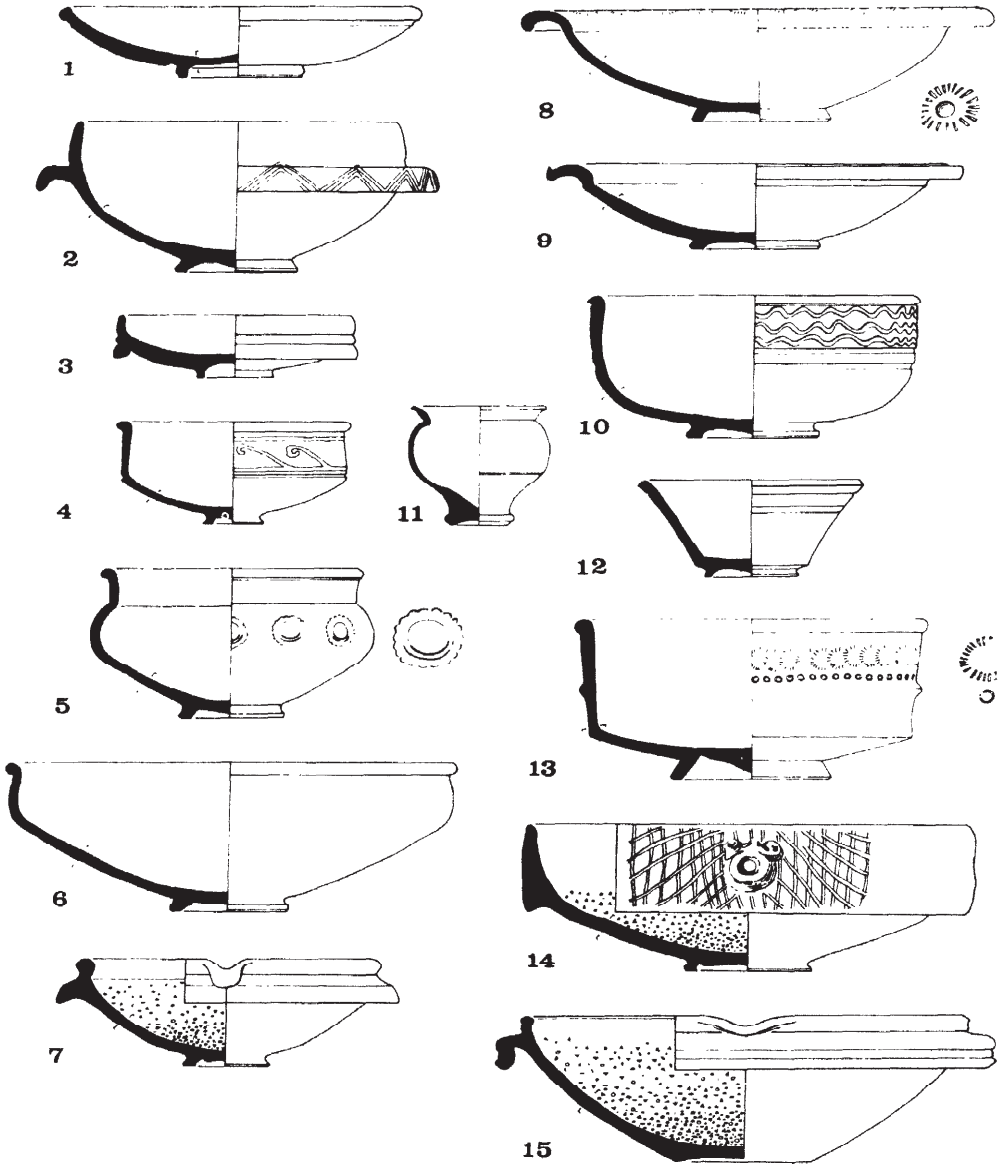


FIG. 6. Some New Forest Group I Products. (Scale: ¼.)

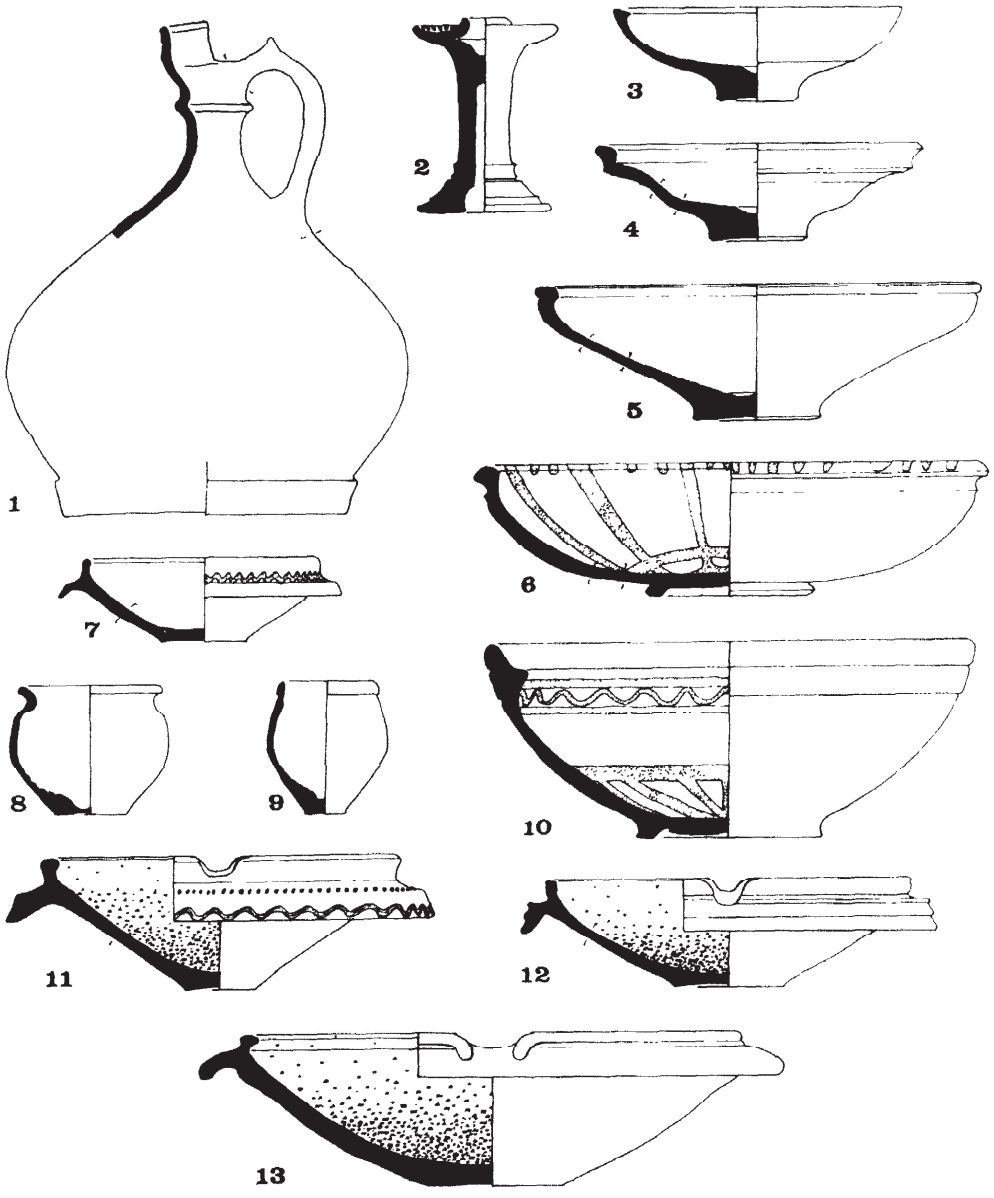


FIG. 7. Some New Forest Group II Products. (Scale: ¼.)

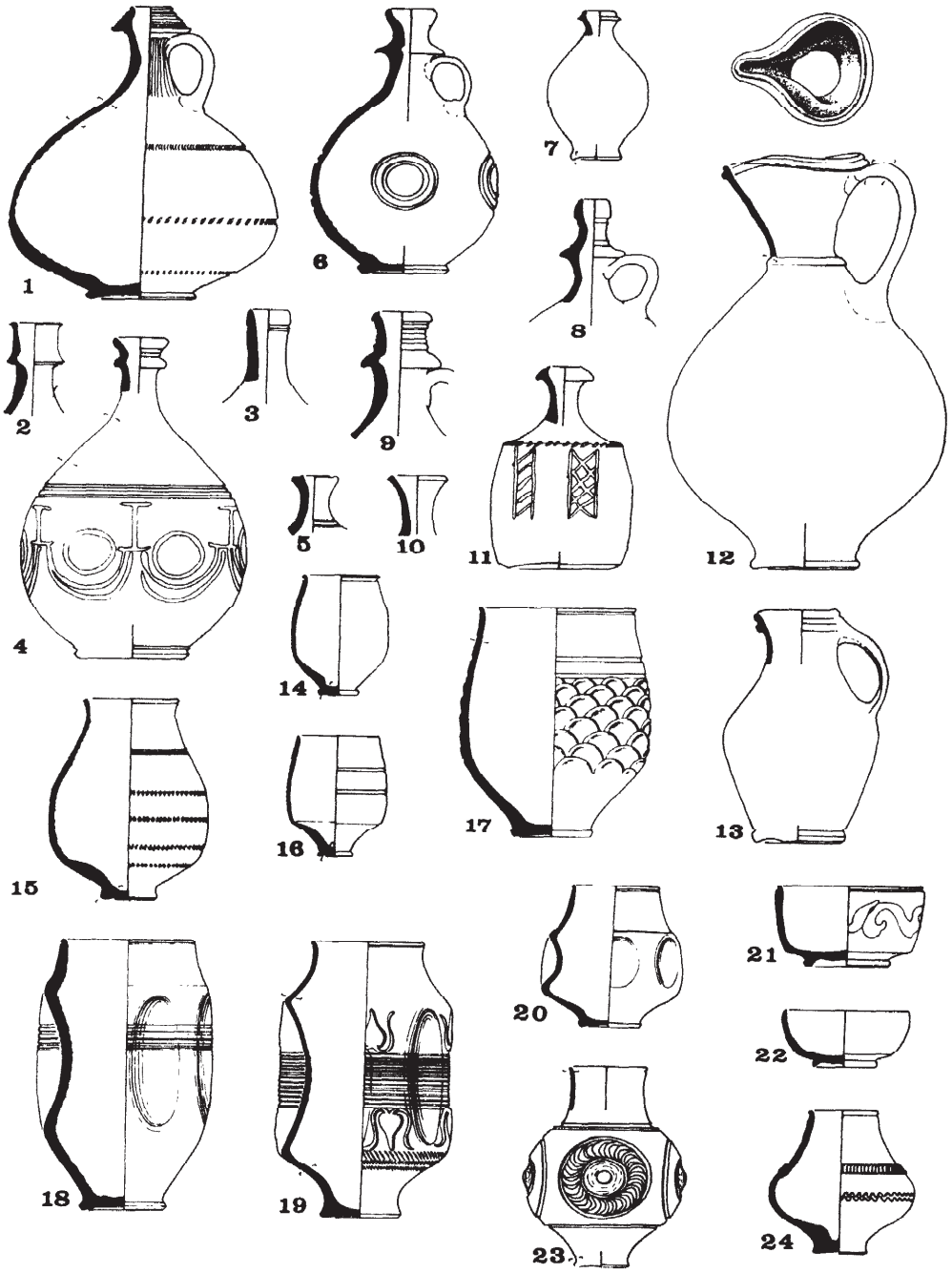


FIG. 8. Some New Forest Group III Products. (Scale: ¼.)

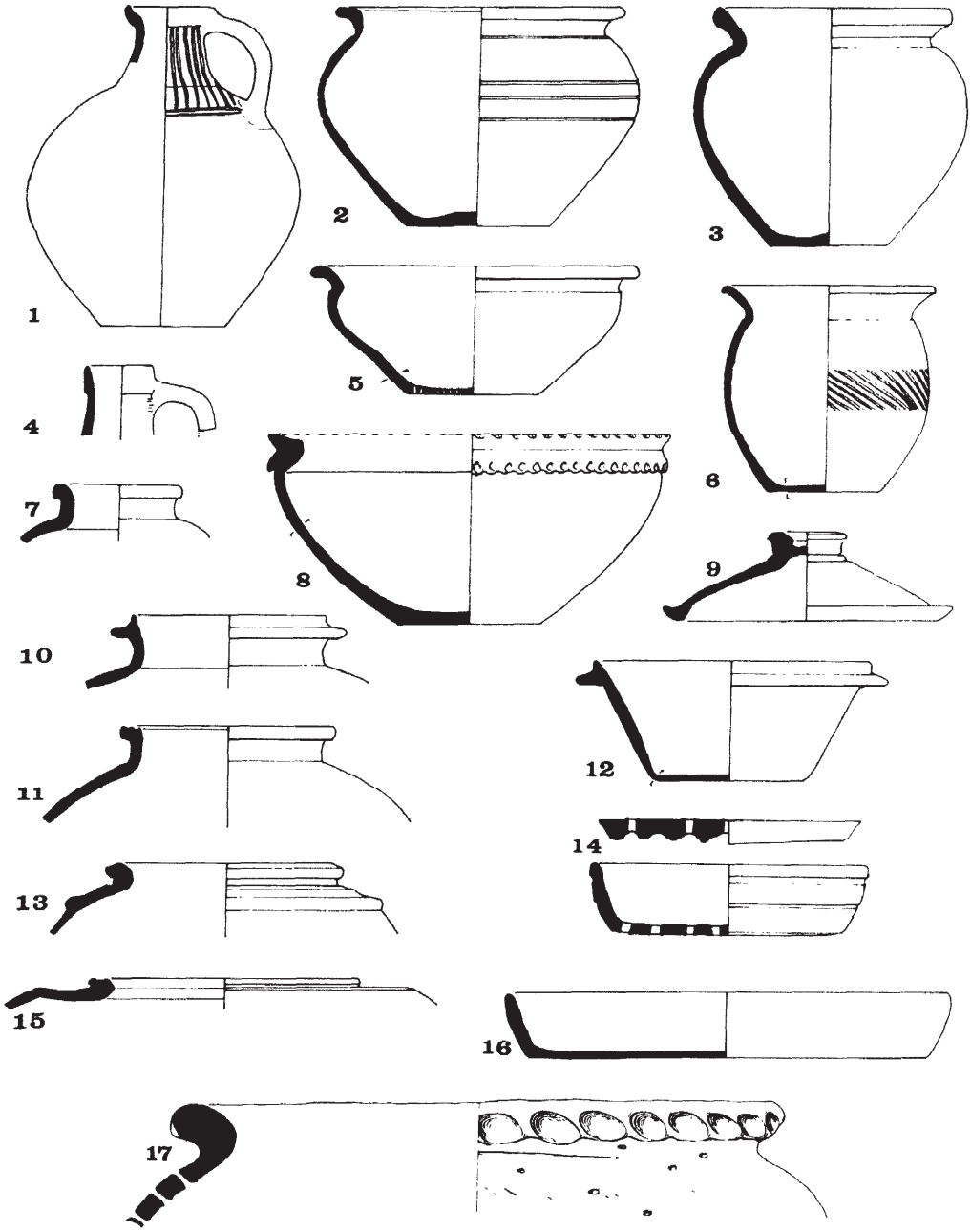


FIG. 9. Some New Forest Group IV Products. (Scale: ¼.)

NOTES ON FIGS. 6-9

Unless otherwise stated the fabrics of the vessels illustrated fall into classes described elsewhere (p. 119-121). Fabric colour and slip (in the case of Groups I and III) are not normally described here since many of the pots illustrated are wasters which did not meet the standards intended.

Fig. 6. Group I vessels.

All vessels are colour-coated.

1. From Lower Sloden kiln (1966 site).
2. White painted decoration; the most common Group I form; from Pitt's Wood kiln (1966 site).
3. From Lower Sloden kiln (1966 site).
4. White painted decoration; from Pitt's Wood kiln (1966 site).
5. Impressed rosettes; from Ashley Rails kiln site; after Sumner.
6. From Pitt's Wood kiln (1966 site).
7. From Pitt's Wood kiln (1966 site).
8. Impressed rosettes; from Pitt's Wood kiln (1966 site).
9. From Ashley Rails kiln site; after Sumner.
10. Incised wavy-line decoration; from Pitt's Wood kiln (1966 site).
11. From Stockton, Wiltshire.
12. From Lower Sloden kiln (1966 site).
13. Impressed demi-rosettes and circles; from Pitt's Wood kiln (1966 site).
14. Coarse (Group IV) fabric with grey core and orange burnished surface with thin self-coloured slip—incised lines and rare moulded(?) lion's head spout; from Staple Gardens, Winchester; after Cunliffe.
15. From Pitt's Wood kiln (1966 site).

Fig. 7. Group II vessels.

All vessels illustrated are in the sandy 'parchment ware'.

1. Colour-coated; a fairly widely distributed flagon form, perhaps derived from metal prototypes; from Lower Sloden kiln (1966 site).
2. Candle-stick with painted decoration; from Pitt's Wood kiln (1966 site).
3. Colour-coated; from Lower Sloden kiln (1966 site).
4. Colour-coated; from Lower Sloden kiln (1966 site).
5. Colour-coated; from Lower Sloden kiln (1966 site).
6. Painted decoration; from Lower Sloden kiln (1966 site).
7. Painted decoration; from Pitt's Wood kiln (1966 site).
8. Colour-coated; from Holbury, Hants.
9. Self-coloured slip: from Lower Sloden kiln (1966 site).
10. Painted decoration: a very common form, also manufactured in the non-sandy fabric; from Imber, Wiltshire.
11. Incised wavy-line and stabbed decoration; from Pitt's Wood kiln (1966 site).
12. Also made in non-sandy fabric; from Pitt's Wood kiln (1966 site).
13. From Lower Sloden kiln (1966 site).

Fig. 8. Group III vessels.

All vessels are colour-coated.

1. Burnished lines on neck, and rouletting on body; from Lower Sloden kiln (1966 site).
2. From Lower Sloden kiln (1966 site).
3. From Winchester, Hants.
4. White painted decoration; from Lower Sloden kiln (1966 site).
5. From Durrington Walls settlement, Wilts.; after Wainwright.
6. Incised/stamped concentric circles; from Lower Sloden kiln (1966 site).

7. From Lower Sloden kiln (1966 site).
8. From Winchester, Hants.
9. From Lower Sloden kiln (1966 site).
10. From Lower Sloden kiln (1966 site).
11. White painted decoration; from Crock Hill kiln site.
12. With carefully pinched pouring-lip; from Lower Sloden kiln (1966 site).
13. With gently depressed slight pouring-lip; from Rockbourne Down, Hants.; after Sumner.
14. From Lower Sloden kiln (1966 site).
15. Rouletted; from Lower Sloden kiln (1966 site).
16. From Lower Sloden kiln (1966 site).
17. Applied 'scaly' decoration; from Lower Sloden kiln (1966 site).
18. Parallel grooving on body—a common feature on indented beakers ; from Lower Sloden kiln (1966 site).
19. Barbotine leaves and rouletting; from Lower Sloden kiln (1966 site).
20, A squat version of 18, but from same kiln group.
21. White painted decoration; a common form usually undecorated; from Lower Sloden kiln (1966 site).
22. From Lower Sloden kiln (1966 site).
23. White painted arcs within incised/stamped concentric circle—medallions, a widely distributed type; from Crock Hill kiln site.
24. Incised wavy-line and rouletted-notch decoration; from Lower Sloden kiln (1966 site).

Fig. 9. Group IV vessels.

1. Burnished lines on neck and area of white paint on upper part of body; from kiln site at Clonmore, Linwood North; after Cunliffe.
2. Burnished on rim; from Lower Sloden kiln (1966 site).
3. Self-coloured slip and burnishing on exterior; from kiln site at Rough Piece, Linwood.
4. Self-coloured slip on exterior, and burnished area on neck; from Rough Piece, Linwood.
5. Burnishing and black slip on rim and exterior; from kiln site at Rough Piece, Linwood.
6. Self-coloured slip and burnishing on exterior; parallel burnished lines on unburnished band; from kiln site at Rough Piece, Linwood.
7. From Sloden Inclosure no. I kiln; after Sumner.
8. Indented rim—a fairly popular form; from kiln site at Black Heath Meadow, Linwood; after Sumner.
9. Black slip on exterior; from kiln site at Rough Piece, Linwood.
10. White paint on rim; from Lower Sloden kiln (1966 site).
11. White paint on rim; from kiln site at Clonmore, Linwood North; after Cunliffe.
12. Black slip; from Lower Sloden kiln (1966 site).
13. Dark brown slip, burnishing on rim and exterior of body; from kiln site at Rough Piece, Linwood.
14. Two piece cheese-wring: from kiln site at Rough Piece, Linwood.
15. Self-coloured slip on exterior; from Lower Sloden kiln (1966 site).
16. From Lower Sloden kiln (1966 site).
17. Hand-made storage jar with knife trimming on the body; from kiln site at Rough Piece, Linwood.

A FOURTH-CENTURY POTTER'S WORKSHOP AND KILNS AT STIBBINGTON, PETERBOROUGH

J. P. WILD

THE first Roman potters on the Lower Nene worked under military supervision outside the south-west corner of the fortress at Longthorpe, Peterborough. Over thirty kilns, dating to *c.* A-D. 50-65, have been excavated there. The superb technique of these potters may have stimulated local industry, but it is not until the mid-second century that the commercial production of colour-coated ware became established. The potters making this worked originally in the industrial suburbs of the Roman town of *Durobrivae* near the point where Ermine Street crosses the Nene. From there they expanded outward along the river valley. By about A.D. 250 Wansford, just west of Stibbington, marks the known western limit of the potteries, while Stanground appears to delimit the eastward expansion towards the Fenland.

Edmund Artis, in the early nineteenth century, noted evidence for Roman potteries at Stibbington, and excavated a number of buildings and kilns. In 1957, Mr. B. R. Hartley investigated three kilns on the river gravel some 800 yards south of the Nene (Hartley, 1960, 9 ff.). It is clear, from surface finds of wasters and kiln furniture, that the whole of the area between the Al road and the Nene, over 100 acres, had been occupied, probably in stages, by Roman potters.

In 1968, the Nene Valley Research Committee was notified by the Norman Cross Rural District Council of its intention to erect council houses on the southern part of the potters' field adjacent to Stibbington School (N.G.R. TL 085986). Dr. Martin Aitken kindly undertook a survey of the area by proton-magnetometer, and pinpointed two kilns, their stokeholes and a rubbish pit.

Excavation of the site at Easter, 1969, by G. B. Dannell and the writer brought to light a complete industrial unit of the early fourth century, comprising two potter's kilns, an associated workshop, stone-lined well and a rubbish pit.

The kilns lay about 60 ft. apart, east of the workshop. They were apparently contemporary, but differed from one another in structure; for the one was designed to fire colour-coated pottery in an oxydizing atmosphere, the other grey ware in a reducing atmosphere.

KILN W

The firing chamber of Kiln W on the eastern edge of the site measured 4 ft. 3 in. internally and was lined with prefabricated clay blocks. Five such courses survive, giving a depth of 2ft. 10in. to the original furnace floor. (The latter had in fact been raked away during firing.) A tongue-shaped pedestal projected from the back wall of the kiln in a style traditional in the Nene Valley. It was constructed of large lining-blocks sheathed in clay.

At some point in the life of the kiln, a semicircular chamber of smaller diameter was added to the front of the firing-chamber proper at the expense of the flue-channel. It was roughly built of prefabricated blocks and luted with clay. The seating for a single

firebar survives upon its wall. The additional semicircle may represent a repair after the front of the kiln and back of the flue had collapsed, which at the same time increased the capacity of the kiln.

The upper (or oven) floor of the kiln had been constructed of firebars, to judge from the broken fragments found within the lower chamber. The firebars, square in section and tapering slightly at both ends, were of two sizes, suitable for the main chamber and for the additional semicircle, A clay floor pierced by small vent-holes had been luted over them.

The flue was 2 ft. long and 2 ft. high, narrowing as it entered the furnace chamber to a width of 7 in. This must have been the width of the shovel or rake used for stoking and clearing out the kiln. The flue was roofed with shaped clay voussoirs and a stone slab. A substantial retaining wall of local limestone faced the stokehole.

Traces of sand adhering to the wasters suggest that sand was used to space the pots in the kiln (Corder, 1957, 26). No other kiln furniture or pieces of kiln structure such as 'dome plates' were found. How—or if—the kiln was roofed remains an open question.

The pottery fired in Kiln W consists exclusively of colour-coated wares and Nene Valley mortaria with reeded rims. Nene Valley jars, flanged pie-dishes, dog-dishes, Castor boxes, imitations of samian Forms 31, 36, 37 and 38, and many varieties of flagon are represented. A small number of painted bowls and flagons in buff fabric occurred. Small colour-coated bowls with painted arches were being made here, but virtually no beakers.

The structure of this kiln was ramshackle, but adequate for oxydized pottery. The wasters had often cracked in firing, or had mottled colour-coats.

The pottery appears to date to the first half of the fourth century on analogy with the material from the kilns dug in 1957.

KILN G

A second kiln, more neatly constructed than Kiln W, lay just outside the potter's workshop. The firing chamber, 3 ft. 8 in. across, had a solid clay lining, surviving to a height of 2 ft. 10 in. Cracks which developed in the lining had been carefully sealed with more clay.

The tongue-shaped pedestal was mushroom-like in section to carry the short firebars of the oven floor. The outer ends of the bars were supported on a continuous ledge running round the inside of the kiln. Still intact, they are linked at their centres by short clay cross-pieces to give the overall effect of a solid clay floor with vent-holes.

The flue had been arched with prefabricated sections and lined with stone. It was found blocked with kiln-débris, perhaps the final blocking to reduce the kiln-load.

The pottery from the filling of the kiln chamber and stokehole was almost exclusively grey ware. Jars, dog-dishes and straight-sided dishes in assorted sizes were the principal products, but some flagons and mortaria appear to have been fired with them.

THE WORKSHOP

The potters were accommodated in a rectangular workshop measuring some 21 ft. by 40 ft. overall. The pitched stone footings, one layer deep, were the only clue to the character of the building. There was no trace of loose or displaced stone, roof-tiles or wattle-and-daub. Nor was there any sign of internal post-holes. The superstructure was, therefore, probably wholly of timber, resting on the stone footings without additional support.

Set against the inside face of the south wall of the workshop were four small stone-lined tanks or bases of tanks. The best preserved still contained about two cubic feet of clay, mixed with ground-up freshwater mussel.

Careful scrutiny of most of the sandy floor of the workshop gave no hint of where plant or equipment might have been set.

The Well

Outside the west end of the workshop a well had been dug, square in plan and 13 ft. deep. The soundly-laid stone lining rested on heavy cross-jointed timbers, permanently under water.

The lower levels of the filling contained a surprisingly high proportion of overfired colour-coated flagons. Among this material lay a flattish millstone, 2 ft. 2 in. in diameter. The curiously smooth, but uneven, wear on its upper surface suggested strongly that it had served as the flywheel or kickwheel for a potter's turntable.

SUMMARY

A complete potter's establishment of early fourth-century date was excavated in 1969 at Stibbington in the Nene Valley. It comprised a half-timbered workshop and two well-preserved potter's kilns. The workshop contained a series of tanks for storing and working clay. The kilns were of standard Nene-Valley type with tongue-pedestals and floors of firebars. One was used for firing grey self-coloured kitchen wares, the other produced a wide variety of colour-coated vessels and mortaria.

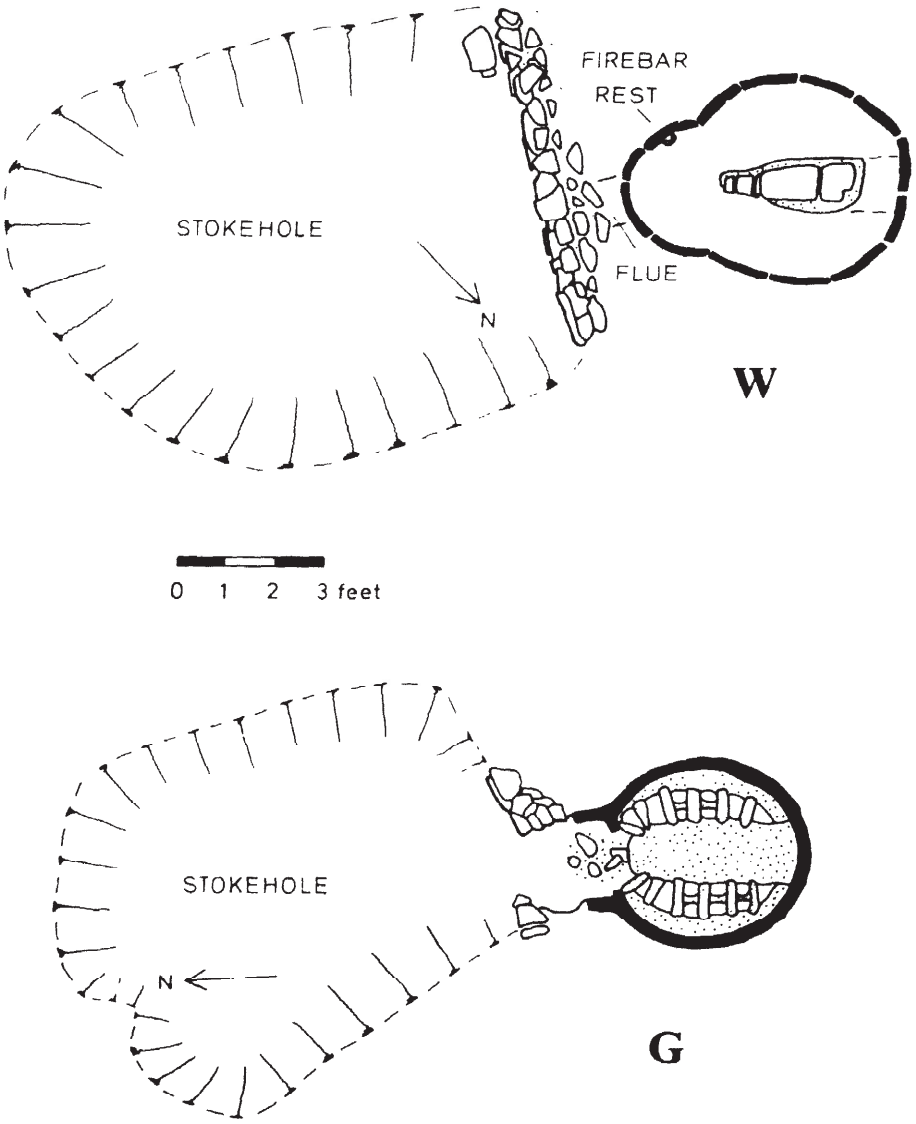


FIG. 1. Fourth Century Kilns from Stibbington, Peterborough.
Above: Kiln W for colour-coated Ware; below: Kiln G for grey Ware.

THE POTTER INDIXIVIXVS

G. B. DANNELL

In 1960, J. C. Mossop drew attention to a group of stamped, imitation samian wares, which appeared to come from the main Castor/Water Newton kiln complex (Mossop, 1960, 226). Soon afterwards, E. A. Standen noted kiln debris at Park Farm, Stanground (N.G.R. TL 216967), fairly close to Horsey Toll (N.G.R. TL 219960), which had recently yielded a complete 'hunt-cup' decorated in an explicitly pornographic style, together with other pottery of seemingly local manufacture.

Park Farm is immediately south of Cnut's Dyke (or King's Dyke), an old course of the Nene. The Roman origin of this waterway has been discussed recently (Phillips, 1970, 186), and proof has come from a mechanical section across the present course, which produced a Saxon cauldron from a peat deposit sealing a dump of Roman kiln-wasters in alluvium. The extension of Roman pottery manufacture to the very edge of the Fens had attractive economic implications, and in 1965 B. R. Hartley and I commenced excavation following a magnetometer survey by Dr. M. Aitken.

Two sadly ploughed kilns were found (Wilson, 1966, 206). The pottery revealed an outlying colour-coated industry of somewhat rustic accomplishment, making thick-bodied, crudely-slipped wares. The range included barbotine-beakers, flagons and reduced plain-ware jars. Of the Horsey Toll artist there was no sign.

Later work, with Dr. J. P. Wild, expanded knowledge of the site by the clearance of a large pit, probably a clay quarry, and the discovery of two further kilns (Wilson, 1967, 186 and 1968, 190). The pit was packed with 'dome-plates' and wasters. It was dug out with garden forks, which often could not be forced through the tightly packed mass. The vessels were mainly jars, and it was clear that the potters experienced great difficulty with the oily fractions in the Oxford Clays. These produced gaseous pockets in the fabric with resultant 'carbuncles', which apparently exploded with monotonous ferocity.

The kilns were well preserved and fired from a common stoke-hole. Both were of traditional Nene Valley design with tongue pedestals and stone-revetted flue cheeks. Both revealed a major re-design of the pedestals which had been lengthened by about a third so as to project almost to the flue-arch, reducing the volume of the furnace chamber. Perhaps, this offered a useful buffer against which to lodge blocking material in firing reduced wares.

Drainage of the brick-earth subsoil had proved difficult, and all four kilns had gullies to evacuate surface water from the furnaces and stoke-holes. To the east, a long, narrow, ditch carried water down towards the dyke. The primary filling of this feature produced the majority of the vessels belonging to the group described by Mossop *(op. cit.)*.

Fig. 1 illustrates the more interesting types. All show the same grey-white, slightly vesicular fabric (Munsell range N-8). The slip indeed varies, as Mossop reported, from a matt red when oxidized (Munsell range 2·5 YR 7/6 to 2·5 YR 3/6), through grey to black when reduced (Munsell range N-7 to N-l·5). The slip is characteristically patchy,

although kiln material is not a good guide. When fired hard it is slightly metallic, but soft firings produce an effect like poster-paint.

The Pottery.

1. Segmental dish, Form 36 variant. A great variety of rim types occurs, some with barbotine (cf. Mossop, *op. cit.),* as in 1(b), others with stamped impressions as 1(a). The footring and base 1(c), seem to belong to this form, although the high kick and rouletting are reminiscent of samian Form 31R. A comparable selection of rims comes from Rheinzabern (Ludowici, 1905, 250) and Colchester (cf. particularly Hull, 1963, 80).

2. Form 37. These owe their overall shape alone to their samian tradition. No attempt has been noted to simulate an ovolo. The decoration consists of rosettes impressed externally and fine bosses made by pressing the inner wall into a hand-mould held against the outside, an early example of this thoroughly Roman habit (cf. Frere, 1963, 351). The base, 2(c), is again an amalgam of various samian forms, sporting both a rosette stamp and rouletting.

3. Form 53. A truly eccentric and unusual variant. Mutilated remains of one of the name-stamps can be seen on the upper wall. The Rheinzabern equivalent (Ludowici, 1905, 246, fig. 4) is more credible. A ribbed handle from a Stanground vessel has recently come from Normangate Field, Castor (unpublished; information from Dr. G. Webster).

4. Pedestal-beaker with concave wall. The pedigree of this type is uncertain, although it has connections with form Ludowici VMh (Ludowici, 1905, 247, fig. 14). The treatment of the lower wall is very like Form 30.

5. Not illustrated. Standard pinch-necked flagon, usually well turned, but heavily made.

6. Scroll beaker. These take two shapes; narrow-necked and upright, as 6(a), or squat and baggy, as 6(b). The long, lanceolate leaves and large bead rows are characteristic.

7. Hunt-cup. Only a few pieces were found, and on 7(b), the barbotine had come away, leaving the decoration in outline only. If the two vessels illustrated are characteristic, then the bag-shaped form was adopted.

8. Indented beaker. There are many variants of this type, with and without barbotine decoration between the indentations. Scale, 'toothpaste-squiggle', and S-motif are used (cf. Woods, 1971, 46, 303 and 304). Gose (1950, Taf. 13, 199) provides a close parallel. The most common form of beaker on the site.

9. Beaker with raised diagonal ribs. This type is scarce. A similar vessel, without a cornice rim, came from Brixworth (Woods, 1971, 89, 297). The fabric is very close to the Stanground vessels, the slip oxidized.

10. Rouletted beaker. Also rare. Good comparative material exists in the Rhineland (Gose, 1950, Taf. 13, 191) and Colchester (Hull, 1963, fig. 58). They appear to belong to a similar service to that of the 'hunt-cups', and are somewhat larger than the other beakers.

The use of stamps is interesting, but limited to a few dies. Such decoration is well known in eastern England from the first century onwards. The so-called Parisian wares have it (Corder, 1958, 48), as do those from West Stow (West, 1953, 35). Finds from the Upper Nene Valley suggest a production centre there, too. Here then is an established decorative tradition. The samian forms are not. Whilst the originals of the bowls and dishes were common, albeit declining in quantity by the end of the second century, the pedestalled vessels are rarities anywhere (Hull, 1963, 98). The connections of the whole

group are sufficient to give serious thought to the idea that someone at work on the site had close acquaintance with a samian workshop, perhaps Colchester.

The internal dating evidence for the group is negligible, the external, widespread and consistent. At Colchester, kiln 24 (with Stanground forms 8 and 10) is dated *c.* A.D. 210-240; kiln 32 (with Stanground forms of decorated beakers) to *c.* A.D. 240-260 (Hull, 1963, 177). However, kiln 32 has many plain-rim types conspicuous by their rarity at Stanground. At Brixworth, the vessels already cited, are dated to the third century. The Rhenish examples quoted from Gose are dated there from the late-second century through into the third. On this basis a date in the first quarter of the third century should fit the beginning of the work, ending sometime before A.D. 250.

The present distribution covers Brixworth in the west to Laddus Grove in the east, over some 100 kilometres of waterway. Further investigation is clearly indicated at all major centres served by the Nene and the Car Dyke-Fen system.

SUMMARY

Stamped samian imitations, first noted, in the Fens are attributed to a kiln site at Stanground, two kilometres east of Peterborough. This becomes the most easterly outlier of the Nene Valley colour-coated industry. A wide range of fine wares with close connections to the Colchester and Rhenish workshops are present. Dating evidence points to a period *c.* A.D. 210-40. So far, similar vessels have come from Brixworth in the west to Laddus Grove in the east. An industry based on distribution by the Fen waterways is indicated.

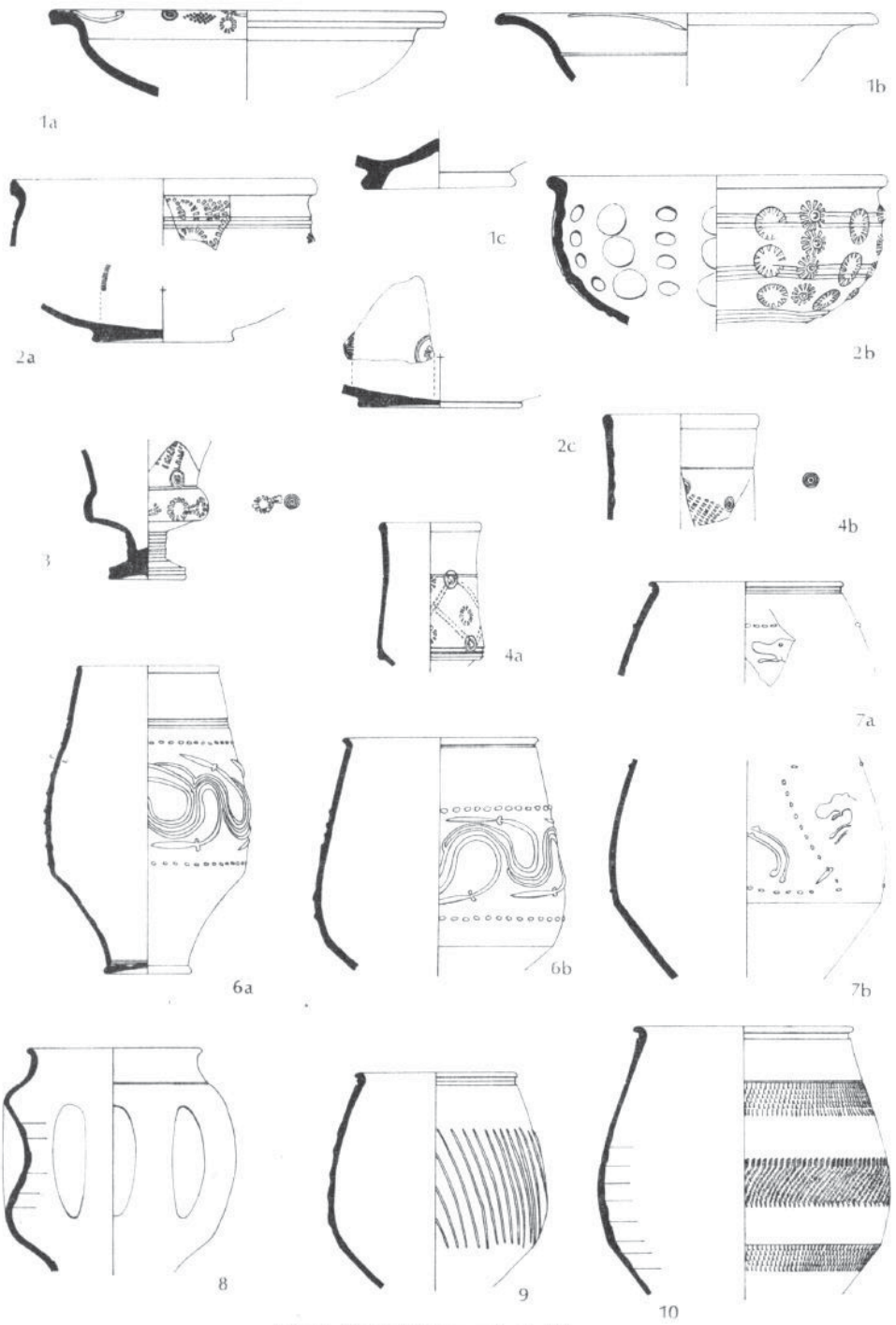


FIG. 1. (Scale ¼.) *Drawn by R. Thomas*

THE KILNS AT MANCETTER AND HARTSHILL, WARWICKSHIRE

K. F. HARTLEY

ALL twenty-one kilns excavated in the parish of Mancetter lie in one field immediately south-west of the small settlement of *Manduessedum* on Watling Street. More kilns are known to exist in neighbouring fields. In the last century four kilns were discovered in quarrying at Hartshill, two miles south of Mancetter, and thirty-four were excavated recently in advance of further quarrying. Since the range in date of the two potteries is the same and they produced identical pottery, and since some potters, such as Junius, used kilns in both places the two sites may be treated as part of the same industry. The most common types of kiln (A, B, D, E), and some unusual types (C, F, G, H) are illustrated in Figs. 1 and 2.

The sample of kilns is large enough for some traits to stand out as normal and others as alien:

1. Grass-marked dome-plates were found at only two kilns (Fig. 2, G and H), both of them unusual. There is nothing to suggest that such dome-plates were otherwise used here and, since no evidence of any alternative covering was found, it is likely that the potters stacked turf around the kiln possibly corbelling it over the load.
2. Local quartzite and diorite, both of which break irregularly, were frequently used in the construction of pedestals, flues and floors in all the common types of kiln except for those, like kiln E, which were made entirely of clay. Fragments of mortaria were sometimes used in the same way (Fig. 1, B). Both practices were no doubt intended to reduce the risk of the kilns fracturing when first fired. Sticks were also often used to bond the clay during the first firing.
3. Only two kilns (Fig. 2, H) had pre-fabricated kiln-furniture including fire-bars, and permanent clay floors to the ovens were clearly normal.
4. When permanent over-floors survived they were of two kinds:

(a) Thick clay floors with vents (Fig. 1, E) were usual in the third and fourth centuries. The unusual kiln G had no oven-floor in position, but fragments showed vents more closely packed and evenly spaced than the average. None of the floor of kiln D was found, but a contemporary Antonine kiln with three pedestals, used by the same potter, Junius, had a floor with many more vents than the type represented by E.

(b) Floors of roughly made permanent bars (Fig. 1, B) with a large solid area over the central pedestal. Kiln F was unique in having a half-floor of this kind at the normal level in the front of the oven, but a lower solid floor in the rear, raised 6 in. above the furnace floor by a step of clay. Kiln B and another, similar but larger, had no sign of normal oven-wall above the level of the floor. A turf cylinder must be postulated for the wall. Kilns E, F and H survived to their full height and all were in perfect condition except for the flue of kiln F. As so often,

no explanation for their abandonment is apparent, and it can only be suggested that a series of unsatisfactory firings led to this.

5. Particularly after A.D. 160, there was a marked preference for free-standing pedestals, usually one or two but occasionally three or four. Tongue-pedestals were used in some of the very small kilns (Fig. 1, A), of the first half of the second century. Kiln G was the only later kiln with one (see below).

6. The widest variety in construction occurred in the second and early third centuries. Most of the smaller kilns (2 ft. 6 in. to 3 ft. internal diameter), belong to the first half of the second century, and no large kiln (3 ft. 6 in. to 4 ft. 6 in. internal diameter) was earlier than *c.* A.D. 140. Kiln E was a massive structure of solid clay and the care and efficiency expended in making it were still evident. Several kilns of this type (usually with two pedestals, sometimes with only one) were excavated; none was earlier than the third century. Some Antonine kilns (Fig. 1, D) were large but roughly constructed and seem to represent an intermediate stage when production on industrial scale was coming in. A few small, roughly made kilns were contemporary with kilns D and E but there is evidence of a definite line of development with kiln E representing the final streamlined product. Kilns closest to E in structure were frequently associated solely with third- or fourth-century mortaria and many were certainly used for firing mortaria alone, although the normal practice earlier was to fire mortaria and other coarse-wares together when similar firing conditions were required.

Any study of the mortaria from Mancetter and Hartshill leaves no doubt that the changes in kiln-structure are linked with the growth of the outstanding trade in mortaria enjoyed by these potteries. Other changes in practice also occurred in the period A.D. 170-230, and are probably related:

1. As already stated some third- and fourth-century kilns were used exclusively for firing mortaria. Mortaria of this period are often harder in texture than earlier ones presumably because of higher firing temperatures.

2. The stamping of mortaria with the potter's name ended in the late-Antonine period at Mancetter and Hartshill. However, this had happened earlier elsewhere in a reverse situation of shrinking production, so its significance is not very clear.

3. The development of new rim-forms, changes in the spouts, and method of gritting. These changes were probably all intended to speed manufacture. The ancestor of the "hammerhead" mortarium has its beginning in this period, though the developed form was not produced until sometime later. The earliest attempts are stamped by Junius and Carita.

Of the kilns selected for discussion here, A-F all belong within the normal traditions of these potteries. Kilns C and F are unique in structure, though the techniques of construction link them with the rest. Kilns G and H (and a second kiln with pre-fabricated furniture) are strictly alien to the main stream. Kiln G is of especial interest; it was producing fourth-century colour-coated ware, related to products of the Oxfordshire kilns: both the pottery and kiln are unique at Mancetter and Hartshill. The very thin, heavily fired, tongue pedestal is notably similar to those in use at the potteries near Oxford (Harden, 1936, Fig. 14 and Pl. XVIb; Atkinson, 1941, Fig. 3). A recently excavated kiln has in addition small clay supports attached to the kiln wall which are very reminiscent indeed of the Hartshill kiln *(Curr. Archaeol.* 3, 211). There seems to be adequate evidence to believe that we have here the work of a fourth-century migrant potter from Oxfordshire.

SUMMARY

Kilns representative of the majority of the fifty-five kilns recently excavated at Mancetter and Hartshill are illustrated, together with those which present exceptional features. There appears to be some chronological development in kiln-building stimulated by the very wide market for mortaria which these potters had. Despite the variety of construction certain features stand out as characteristic of the average kiln here, notably that the kilns had permanent fittings, that the potters did not normally use clay dome-plates for covering the load, and the frequent and rather casual use of the local stone in kiln-building. There is also evidence for the presence of a migrant potter almost certainly from the Oxfordshire potteries.

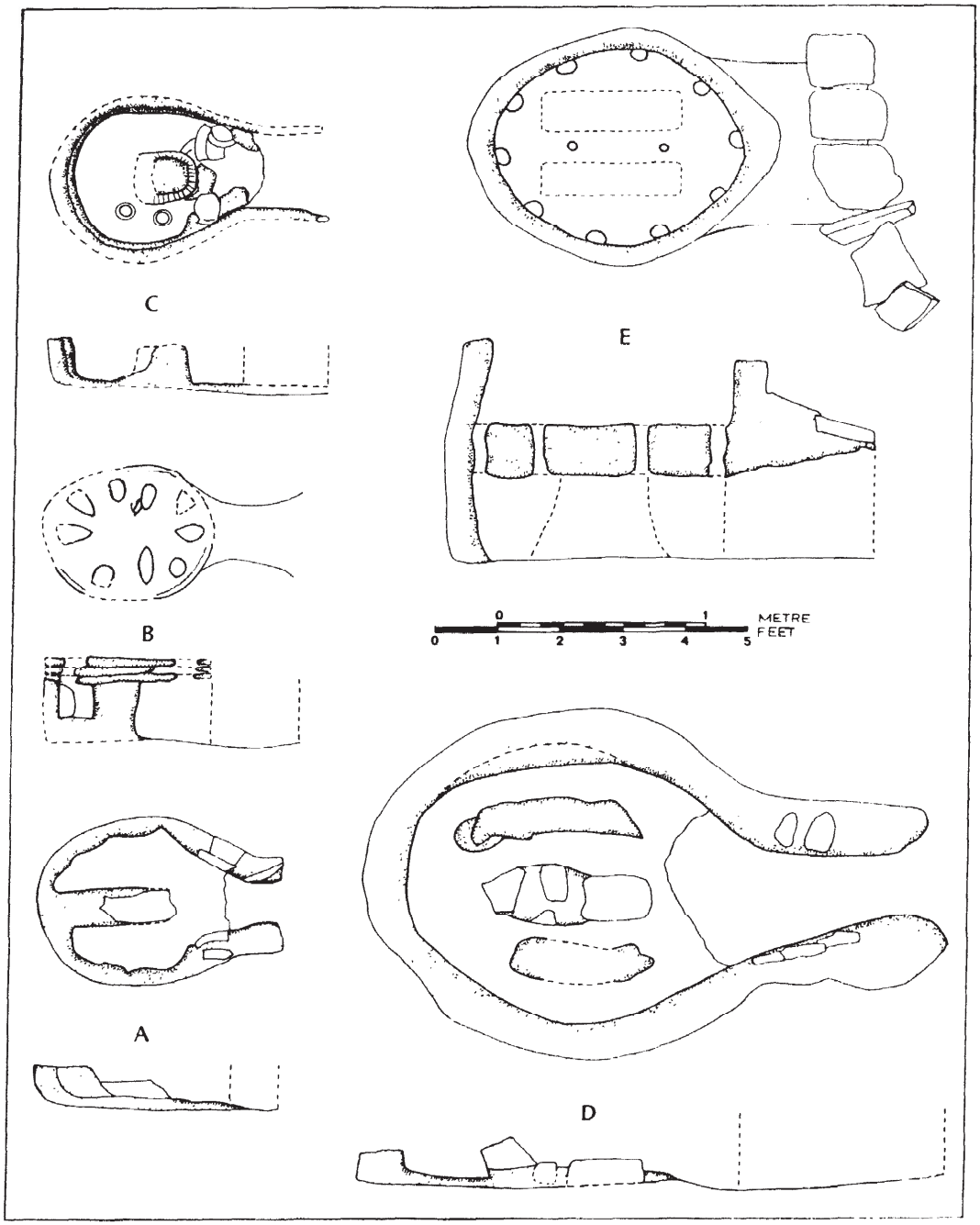
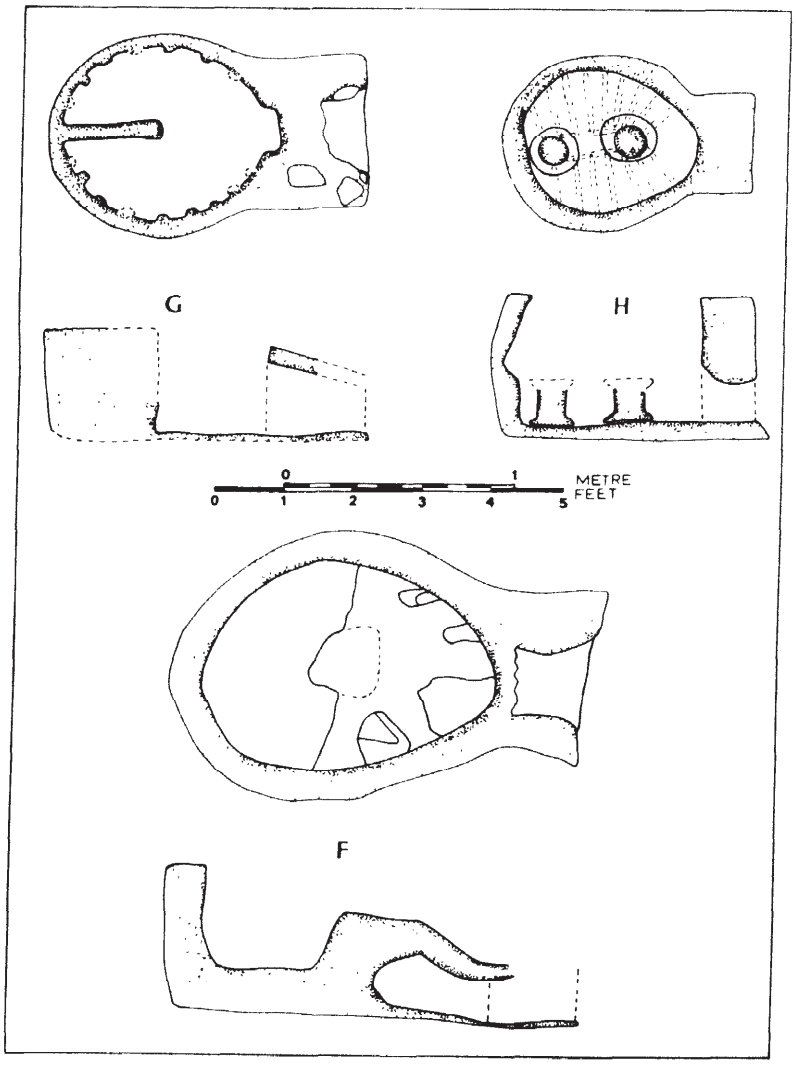


FIG. 1. Kilns of normal Type at Mancetter and Hartshill.



FIG;. 2. Kilns of unusual Type at Mancetter and Hartshill.

EXPERIMENTAL ROMANO-BRITISH KILN FIRINGS

GEOFFREY F. BRYANT

IN the absence of documentary evidence the only firm ground on which experimental kiln firings can be based are the results of excavations on kiln sites, which, with subsequent scientific examination, can supply details of the kiln substructure and furniture, the pottery produced, the fuels used, and the firing temperature achieved.

The archaeological evidence (Corder, 1959) shows that the Romano-British kilns were of updraught type with normally one, but occasionally two, flues. The one-flued kilns[1] had a raised floor which was either a built-in feature of the structure or formed of prefabricated bars and pierced with vents to allow the passage of hot gases into the oven above. Usually, the floor was supported by a pedestal which took various forms; exceptionally, the floors were unsupported.

The pottery was stacked on this floor for firing and, below it, was the oven-pit which, on available evidence, was usually sunk below ground level. Recent work (e.g. at Rushden, Northants, in *Curr. Archaeol.,* 31, 204-05) does indicate a class of entirely above-ground kilns which should be noted, but their distribution and frequency are at present unknown. The kilns were fired from a stoke-pit in which the potter stood whilst tending the fire. This latter was contained within the flue, a tunnel-like feature which connected the oven-pit and the stoke-pit and acted as a passage down which the hot gases flowed into the kiln. It varied considerably in length, one type being no more than an arched opening through the kiln wall, others being long tunnels extending away from the kiln.

The two-flued kilns had opposed flues leading into an oven with or without a raised floor. Corder (1959, 23-4) calls them horizontal draught kilns and, though the name implies that the hot gases from one stoked flue would travel horizontally through the oven and exhaust through the opposite flue, this is not the case and both flues would have been fired simultaneously. Experiments on the medieval forms of these kilns at Barton in 1971 showed that true horizontal firing is impossible and could presumably only be accomplished with the aid of a solid permanent dome and a chimney at the end of the exhaust flue. Two-flued kilns are updraught kilns whose form allows a greater size of oven and avoids the cold spot at the rear of the oven noted in the one-flued type. Present evidence indicates that two-flued kilns were rare in the Romano-British period and there has been only one experimental firing (Gunn, 1971) at Chichester.

Examination of the pottery shows that oxidized (red-brown,) and reduced (grey-black) pottery was produced in the kilns. The oxidized firings should have been no problem; these merely entail ensuring that oxygen was present in the oven during the cooling period, which in effect meant that the potter had to take no action which would establish a reducing atmosphere at this point. The production of the grey-black ware was more common during the Romano-British period, but the techniques associated with its production are less well understood and are the subject of the experiments described below.

[1]The nomenclature adopted here for the various parts of the kiln is as in Musty, 1966.

There are two possible methods. By using a restricted air flow into the kiln it is possible to produce a reducing firing which may even fail to burn out the organic matter in the clay.[2] If oxidizing conditions are not established during the cooling period the pottery will remain grey. However, if the fuel is burnt with a good air-flow all the organic matter may be burnt out and an oxygen-rich atmosphere maintained. Here the production of grey pottery entails taking active steps during the cooling period to establish reducing conditions (Bimson, 1956, 201). The archaeological evidence shows that wood was invariably the fuel used to fire the kilns. Recent work by Tite (1969, 140) shows that temperatures within the range 500 °C. and 960 °C. are evidenced for these coarse wares, though it should be noted that temperatures above 900 °C. only apply to sherds from a kiln site which were noticeably bloated. A more valid temperature range may be 650 °C. to about 900 °C.

This then, stated briefly, is the firm ground on which the kiln experiments described below are based. One of the main points of speculation should now be discussed, i.e. the form of roofing for the kiln oven. In the past kiln excavators often attempted to illustrate or at least explain the complete form of the kiln remains which they had recovered in excavation. As already indicated, many complete sub-structures are known and the basic forms are not in doubt. The way in which the oven was roofed formed the main subject for speculation. Corder's interpretation (1959, 14, 4) became for many the accepted thesis, i.e. the kiln roof was 'a temporary domed structure formed of turves, straw and clay, built up on a framework of branches around the pots as they were stacked, and removed when the firing was complete'. A reconstruction of a kiln excavated at Canterbury (Corder, 1959, 14, Fig. 3) incorporates these features and is in the form of a temporary dome raised above low vertical and permanent oven walls. The often-mentioned clay plates with grass or straw impressions, and the pieces of clay with internal evidence for burnt-out twigs or branches should be noted here. Corder interpreted the plates as forming reinforcing elements for the dome wall, and the twigs or branches as a framework around which the dome could be raised.

The temporary dome thesis was questioned by P. Mayes (1968, introduction) who doubted the existence or validity of this type of superstructure and experimented with kilns whose domes were permanent (Mayes, 1968; and *Curr. Archaeol.,* 4, 94-6).

Experimental firings began in 1952 at Wattisfield (Watson, 1958) and have been continued at Boston (Mayes, 1961 and 1962), Leeds[3] (Mayes, 1968 *; Curr. Archaeol.,* 4; and forthcoming), and Barton-on-Humber (Bryant, 1970; 1971 ; and forthcoming). The results of this work are summarized on Table 2.[4]

It is now clear that the experiments at Wattisfield, unfortunately rather briefly reported, were aimed at answering the relevant questions. Would a kiln of Romano-British type fire grey pots as a matter of course ? Did the Romano-British potters fire grey pots, by design or accident ? How high were the walls of the kilns? The technique finally devised for the third firing in 1956 was to cover the kiln dome and flue at the end of the firing 'sealing off the furnace when enough wood was in it to create and maintain a reducing atmosphere' (Watson, 1958, 73). The necessity of this latter action was

[2] Hodges (1964, 40) further states that firing in this manner may even entail the loss of part or all of the oxygen of the clay's metallic oxides, or, if the kiln temperature remained low (below 800 °C.?), ensure the stability of the black oxides of iron.

[3] Whilst the relevant experimental firing at Leeds was of a kiln based on the mid-Saxon form found at Thetford these are basically of Romano-British type and the techniques investigated are of note here. Thanks are due to Mr. P. Mayes for allowing sight of the records of these experiments prior to publication.

[4] There are at present no detailed reports available regarding the experiments at London, Chichester (Gunn, 1971) and Lincoln, and the results of this work are largely unreported in this paper.

questioned, but the technique was seen to work at least partially for it was noted *(op. cit.,* 74) that 'many examples of grey ware we(re) obtained'.

The forms of the two experimental kilns fired at Boston were based on ones excavated in the Nene Valley and at Cantley, Doncaster. In the former case, the normal one-flued updraught kiln had a raised floor supported on a tongued pedestal which projected from the rear of the oven pit. A stout wall along the front of the flue acted to prevent the kiln collapsing into the stoke-pit. The Cantley form was without the retaining wall and had two spine pedestals to support the oven floor.

Both kilns were fired with temporary domes covering the ovens and a final firing temperature in excess of 900 °C. is reported. During the cooling of the first kiln measures were taken to ensure as airtight a seal as possible 'to exclude oxygen from the kiln . . . and thus produce the typically reduced (grey) pottery'. It does not seem that the Wattisfield example of stoking the fire prior to sealing was followed, and the resulting lack of charcoal in the oven pit is in fact noted (Hartley, 1961, 2). During the second experiment, it was hoped that positive measures during the cooling period, i.e. the introduction of greenery and water into the flue would 'maintain a reducing atmosphere'. These measures resulted in alarming temperature fluctuations, and the method used in the first firing was resorted to in the hope that oxygen could again be excluded from the cooling oven. In the first experiment, all the pottery remained oxidized, but the 'majority' of the second load was reduced.

The fuller reports of these experiments provide information regarding temperature achieved, amount of fuel consumed (see Table 1) and a statistical analysis of the fired pottery. The technique employed in the second firing was, however, very similar to that employed at Wattisfield, and the experiment presumed that during the early cooling period the entry of oxygen into the oven was unavoidable and would have a significant (i.e. re-oxidizing) effect on the pottery. Steps were, therefore, taken to burn up this oxygen and therefore create the required reducing atmosphere.

The technique used in the Leeds experiments (Mayes, 1968) was essentially the same as that of the second firing at Boston and large amounts of greenery were packed into the flue and oven-pit so that 'the smoky atmosphere thus produced provided the condition of no oxygen and a presence of carbon monoxide required for reduction'. A complete load of grey ware was produced in the second firing.

In 1968, the first experimental kiln was fired at Barton-on-Humber. Reports of the previous work were studied and certain conclusions were accepted:

(i) that kilns with permanent domes seemed to provide the answer to the problem of holding a reducing atmosphere within a cooling kiln;

(ii) that the exclusion of oxygen from a cooling kiln was impossible and the technique used during this period should ensure that the oxygen which did enter was quickly burnt up.

The method to be used in burning up this invading oxygen was, however, in question. It was argued that the blocking of the flue with greenery was a very time consuming procedure and simpler techniques should be considered and investigated. This search for simplicity has been a constant intention for it appeared clear that the Romano-British potter could produce grey ware with such certainty that anything but a very simple technique would be unlikely.

The kiln built in 1968 (Bryant, 1970, fired three times, Barton l-3 on Table 3, Plate 1, and Fig. 1) was therefore permanently domed, and it was found that if the fire was stoked immediately prior to sealing, the kiln required no further attention and loads of grey ware were assured. The technique which produced partial loads of grey ware at

Wattisfield in 1956, here, with a permanent rather than temporary dome, produced complete loads.

By 1970 the group carrying out these experiments, though happy with the simple but totally effective firing technique, were less happy with the permanent dome. These are archaeologically hard to substantiate and are quite difficult to build. All aspects of loading these ovens are complicated—at Leeds and again at Barton loading-times in excess of five hours are recorded, and satisfactory packing, i.e. guaranteeing a stable load stacked in a way which will ensure a good flow of hot gases through the pottery, is very hard to achieve. It was therefore decided that further experiments with temporary domes kilns were justified, particularly as this form is soundly attested archaeologically (for example, see Brassington, 1971, Fig. 2; and Gunn, 1971, 10).

Two kilns were built (Barton 4 and 5, see Plate 2, Fig. 1, Table 3, and Bryant, 1971) with the normal single flue and raised oven floor, but instead of a permanent clay dome, the oven walls were merely carried up vertically for some 2 ft. 6 in. Two advantages were immediately obvious; the kilns were built and loaded in a fraction of the time needed for the domed variety. Additionally, the loading was clearly more efficient in that it was a simple matter to arrange the stacked wares in a manner likely to produce the all-round flow of gases through the load. The method of doming to be adopted was the subject of much discussion—it seemed that the method used at Boston, i.e. doming the kiln with clay plates before the firing began, involved some risk to the unfired pottery. Further, the use of unfired clay meant that shrinkage took place during the firing which caused substantial cracking of the dome. This necessitated constant attention and repairs, and the need to sprinkle the dome with water during the cooling in order to reduce the possibility of air being drawn into the oven. The method seemed too risky, too time-consuming and altogether too complicated.

After further discussions with local tilers experienced in firing the open-topped kilns still to be seen along the Humber bank, it was decided to attempt the method they used. Initially, the kilns would be fired without any dome at all and so allow the pottery to harden before it was made to bear the weight of the dome. One interesting feature emerged almost at once in that there was not the expected significant loss of heat through the open top of the load. It was clear that each inverted pot was acting as a small dome within the load and even when a temperature of nearly 500 °C. was recorded in the centre of the oven surprisingly little heat was escaping from the kiln.[5] When it was considered that the pottery could bear the weight, doming began. First pre-fired clay plates and tiles were placed over the load and these were subsequently covered with a thick layer of turves and clay to complete the dome.[6]

Kiln efficiency clearly improved as the dome was built and more and more heat retained within the oven. At the end of the firing the technique used in Barton 2 and 3 was employed for the clamping down and cooling. Kiln 4 produced a complete load of grey ware, but because of an error in kiln construction only a partial grey load was obtained from kiln 5.

The 1972 experimental firing was aimed at investigating the techniques associated with the building and firing of above-ground, turf-built kilns evidenced in excavations at Rushden *(Curr. Archaeol.,* 31, 204-05), and Blackston. The kilns appear to have pre-

[5] For a comparison of the efficiency of domed and open-topped kilns see Bryant, 1970, table 1, and Bryant 1971, table 1.

[6] Experiments with open-topped kilns in 1971 showed that an unfired load is capable of supporting a layer of tiles, and that such an initial covering of the load will cut fuel consumption and reduce the number of broken pots in the top layer of the load. It only becomes necessary to dome the oven with turves and clay at the very end of the firing.

fabricated pedestals and bars which are brought to the site and from which the raised oven-floor is built. It was found that with this furniture already to hand a one-flued, 3 ft. diameter kiln (see Fig. 2) with oven wall turf-built to a height of 1 ft. 9 in. could be built in about 15 man-hours. Loading with 86 pots-all thrown vessels of similar shape and size—took some 20 minutes. This was the first kiln fired at Barton using newly-cut timber for all previous firings had been with old railway sleepers, etc. Though the amount of fuel used was comparable, it was found that the cut timber would only supply *c.* 800 °C. easily and that getting the temperature above this point involved considerable effort and an increased use of fuel. The pottery was covered with tiles, turves (see Plate 3), and sand during the firing. Immediately prior to sealing, a pot was removed from the oven through the exhaust vent and it was seen to be oxidized. The kiln oven was finally sealed with a further layer of sand and, as usual, the flue was filled with wood just prior to being blocked with a wall of bricks. The kiln was allowed to cool for 15 hours without any further attention. Early in the cooling period the turves above the load were seen to be burning away in places, and there were soon holes through the dome. When the flue blocking was removed, it was seen that the fuel had almost burnt away and there were none of the charcoal logs noticed after previous firings.[7] Clearly the lack of careful sealing with clay had allowed an airflow through the kiln during the cooling and the necessary reducing conditions had not been obtained. All the pottery was oxidized and the experiment indicated that some care must be taken with the sealing of a kiln if a reduced load is to be ensured.

The following conclusions and observations are based on the experiments reported and on experience gained by the author during the work in Leeds in 1967 and Barton-on-Humber during the period 1968-72.

Kiln Building

It is of course obvious that permanently domed kilns take longer to build than open-topped kilns. The only statistics available are those for Barton Kilns 1-3 (permanently domed) which took 99 man-hours to build, and Barton Kiln 6 which took about 15 man-hours.[8] It should, however, be noted that Barton Kilns 1-3 was the first kiln built by the group carrying out these experiments and, if such a kiln had to be built in 1972 after 5 years of practice and experience, it is likely that the time could be at least halved. The 1972 kiln was an above-ground turf-built structure requiring the digging of no stoke- or oven-pit and this again would reduce the time involved. Unfortunately, no figures are available for the building of Barton Kilns 4 and 5, but an estimate in the range 20-30 man-hours is possible.

The greatest difficulties facing the Romano-British kiln builder were found in constructing the flues and raised floors particularly when they are not of pre-fired materials. The problem of spanning the flue, is of course, considerably eased when there is archaeological evidence which allows a valid reconstruction using stone, tile, or some other solid material, e.g. Barton Kiln 6. Arches of clay are known and again the experience gained over five years was valuable especially in building flue-arches. The Barton team built the flue-arch of Kilns 1-3 only at the third attempt whereas five years later no such record of failure would be expected and flue-arch building comes easily.

The floors of the Boston and Leeds (Thetford) experimental kilns were of unfired clay, and considerable difficulty was encountered as a result. During the building, firing,

[7] A similar lack of charcoal was noted after the Boston 1 oxidized firing (Hartley, 1961, 2-3).

[8] In both cases, the kilns had prefabricated raised floors added later, and the time taken to form and fire these bars is not included.

and cooling of the kilns collapse (e.g. Boston 1), or worrying cracking occurred on these floors (see Mayes, 1968, comments on slide 9) and the advantages of a prefabricated floor, in which a broken bar can be replaced for future firings, seem obvious. It is clear, then, that the construction of a clay floor, supported or unsupported by a pedestal or tongue(s), involved considerable skill, and further experiments are necessary to investigate the problems and potential advantages of the technique.

KILN LOADING

Although it is possible to load a permanently domed kiln through the oven exhaust-vent (e.g. Leeds Thetford kiln, Mayes, 1968, and Barton 1-3) the procedure is very slow,[9] and it is extremely difficult to ensure the technically efficient stacking needed for good firing conditions, i.e. a good all-round gas flow to all parts of the oven. The loading of an open-topped kiln is simple and quick (e.g. Barton Kiln 6 took 20 minutes) and therefore overcomes what is clearly one of the major disadvantages of the permanently domed type.[10]

Using apparently any type of wood, the kilns, either permanently or temporarily domed, will easily fire earthenware to a temperature over 800 °C., and with some attention in excess of 900 °C. It is, however, hardly likely that a temperature much above 900 °C. was required (see above, p. 150). No great labour is involved during the early part of the firing, and the temperatures up to *c.* 700 °C. can be achieved without the kiln requiring constant attention. The potter could be doing other work.[11] Above *c.* 700 °C., it seems from the evidence at Barton that constant attention to the fire is necessary, but the length of time involved is far from excessive, and it is unlikely that kiln firing was one of the potter's most time-consuming tasks; see Table 1 below.

TABLE 1.
Firing details for experimental kilns.

Kiln	Time to reach max. temp. (hours)	Time to reach 700°C. (hours)	Time kilns may need constant attention (hours)
Boston 1	13.10	*c.* 8.30	*c.* 4 $^{2}/_{3}$
Boston 2	13[12]	*c.* 10	*c.* 3
Barton 1	11	8	3
3	13	*c.* 10	*c.* 3
4	10	6 $^{3}/_{4}$	2 $^{1}/_{4}$
5	10 3/4	7	3 $^{3}/_{4}$
6	9 1/4	7	2 $^{1}/_{4}$

Fig. 3 shows the increase in temperature achieved by each hundredweight of fuel during the firing of five kilns. Whilst it is clear that conditions vary in the early part of the firing, it is noticeable that, irrespective of the type of dome, a kiln in the 3 ft. to 3 ft. 6 in. diameter range will reach *c.* 800 °C.[13] with approximately 3 cwt. of wood.

[9] Loading the permanently domed Laverstock kiln at Leeds in 1967 took over 8 hours (Mayes, 1968, Laverstock No. 2 firing, running log).

[10] Permanent domes and easy loading are combined in the post-Medieval kilns of Musty type 3, i.e. multi-flue kilns, when their large size allows a walk-in entrance to be inserted in the side of the oven dome.

[11] Also see Hartley, 1961, 3.

[12] A temperature above 900° C. was retained for a further 5 hours, but this was connected with attempts to produce reducing conditions within the oven.

[13] These are average temperatures within the oven, and firing the experimental kilns beyond this point is often necessary to increase the temperature in the cold spot(s) within the oven—this/these could no doubt be largely or even totally avoided by more efficient stacking.

Above this temperature the speed of fuel consumption increases dramatically and, if future work on the determination of firing temperatures of these grey wares should show that *c.* 800 °C. was the necessary temperature, the fuel consumption in the range 4-5 cwt. evidenced at Barton could be reduced by at least one third. It is of interest to note here that the Barton Kiln 6, fired with freshly cut timber, reached 800 °C. without great difficulty, but that firing above this temperature was only achieved with some difficulty.

Some mention should be made of a possible relationship between kiln alignment, wind direction, and the efficienty of firing. Kilns fired at Barton (including some medieval replicas reported elsewhere) have had flues facing most points of the compass and have been fired with the wind blowing from various directions and at various speeds. In the case of one-flued kilns the early part of the firing is facilitated if the wind is blowing up the flue. Some difficulty was noted in the early part of the firing of Barton Kiln 6 when the wind was blowing from the south-west and the flue faced north. However, use of a shield on the east side of the flue, and the temporary heightening of the oven wall to the south-west of the kiln, clearly improved performance. Similar problems are hardly noticed in the case of permanently domed kilns. The firing of two-flued kilns (Barton, 1971, firing reported elsewhere) particularly when a strong wind blows into one flue, again involves early problems and difficulty is encountered in getting an even spread of heat throughout the oven. The problems seem to be short-term only, and the position can be greatly relieved by the judicious use of shields at the flues. Once any kiln oven and load get thoroughly warm *(c.* 300-400 °C.) wind direction is of virtually no significance and may merely have a marginal effect on the amount of fuel used. The conclusions reached at Boston (Mayes, 1961, 7) are in general confirmed, i.e. it is not necessary to align the kiln flue to the prevailing wind.

Once the firing has been completed, the kiln has to be sealed for cooling. In the case of the permanently domed kilns this merely entails blocking the flue and exhaust-vent with bricks, stones, etc., and sealing the cracks with clay (Mayes, 1968; Bryant, 1970, 5). The open-topped kilns present a more difficult problem and details of Corder's interpretation have been given (see above, p. 150). This temporary dome method was attempted in both the experiments at Boston but showed that when the framework of branches had burnt away and the surrounding clay became fired and shrank, it is difficult to maintain the comparatively airtight conditions required during the cooling period. Further, it is very hard to suggest such a procedure for the larger sized Romano-British kilns where any attempt to dome a load of unfired pottery in such a manner is fraught with considerable danger.

Experiments at Barton in 1971 when two kilns were fired for some hours without any form of covering for the load did show that this technique is equally dangerous, for the pottery on top of such an open oven is unable to withstand the violent fluctuations in temperature caused by alternate contact with the hot flames from the flue and the much colder surrounding air.

A compromise, as at Barton in 1972, seems most efficient—here the load was covered before the firing began with a layer of broken tiles and pottery. Towards the end of the firing the dome was completed with a covering of turves and sand. This experiment did, however, show that doming involves a degree of care, and the intentional rather perfunctory sealing of Kiln 6 did not ensure the necessary reducing conditions in the oven. There is little doubt that a final covering of wet clay over the flue blocking and the dome would have resulted in the production of a complete load of grey ware.

It should also be noted that when these temporary domes are removed at the end of the cooling period little evidence of their existence remains. Within a short time the clay sealing material becomes indistinguishable in the area around the kiln, and only the pieces of burnt turf, often reduced to pea-sized pieces which on close examination show traces of burnt-out grass and roots, hint at the form of the dome. At Barton much use has been made of tiles for the initial domes but it seems likely that much of the broken pottery found around the excavated kilns could well have been used for this purpose.[14]

Finally, though it is possible to suggest a firing sequence involving loading and firing during one day, cooling during the night, and unloading on the following morning, it is clearly impossible to hazard a guess at the number of firings undertaken in one year.

The Industry

It is impossible at the moment to suggest how many times a particular kiln could be fired before replacement became necessary. It should, however, be noted that this factor is not likely to have been of major concern to many, or even most, Romano-British potters for it can be seen (e.g. Barton Kiln 6) that many of the kilns must have been very quickly built, and formed a not very valuable piece of capital equipment.

Of much more concern to the potter must have been such matters as the state of the market for his products, the eventual need to replace his far more valuable pieces of capital equipment such as the workshop and drying-sheds, and the supply situation with regard to wood and clay in the area around the pottery. An excavator then, attempting to establish the period of production of a particular pottery site would do well to concentrate on these latter factors rather than use kiln remains as a basis for any estimate.

No valid statement can at present be made regarding the efficiency of these kilns in terms of the percentage of 'good' pots produced per firing. Wastage rates are available for three firings where loads (in no case thrown to 'fit' the kiln) of thrown ware were fired.

TABLE 2.

	Total No. of pots fired	No. of wasters	% Wasted
Boston 1	182	78	42·8
Boston 2	205	c. 20	10
Barton 1	78	21	26·9
Barton 6	86	28	32·5

A simple and reliable method of producing grey ware has now been demonstrated and, in essence, merely entails stoking the kiln with fuel prior to careful sealing of the flue and exhaust vent. The technique was used at Wattisfield (Watson, 1958, 73-4) and found to work although, as noted above (pp. 150-1), the report concluded that after only one successful firing the procedure was still in question. Six further firingsat Barton-on-Humber (Barton Kilns 1-6) have all used this method and Kilns 1-4 produced 100 per cent. grey ware loads. The failures associated with Kilns 5 and 6 are easily accounted for by either bad design or intentionally careless sealing.

In conclusion, it seems then that the evidence gained from the experiments noted above indicates that a simple and technically efficient way to produce Roman grey pottery may be summarized as follows:

[14] A replica medieval multi-flued kiln was fired at Barton in 1972 with such an initial covering for the load —turves being used towards the end of the firing to form the final dome.

(i) build the kiln with an open top;

(ii) load the kiln and cover the pottery with a layer of waste tiles and/or pottery;

(iii) towards the end of the firing complete the doming with some more impervious material, e.g. turves, clay, sand;

(iv) immediately prior to sealing the flue and exhaust vent stoke the fire with a fresh supply of fuel;

(v) complete the kiln sealing in a careful manner designed to ensure that the oven is to a considerable degree airtight during the cooling period.

Despite the number of experimental firings already undertaken the following, undoubtedly incomplete, list of problems worthy of further research to be noted;

(i) the reason(s) why some kilns have long tunnel-like flues, e.g. Lincoln Race-course (Corder, 1958, 21, Fig. 1l), and others short flues, e.g. Dorchester and Weston Favell *(op. cit.,* 18-19, Figs. 7 and 9) are at present unknown. It may be that long flues would facilitate the establishment and retention of reducing conditions in the oven during the firing period, and they would certainly enable the potter to get a large amount of wood into the flue immediately prior to sealing;

(ii) to get valid statistics for wood consumption on a particular kiln site, it is imperative to know the temperature to which the kiln was generally fired. Determination of these firing temperatures from a study of unwasted sherds fired in the kiln is therefore necessary;

(iii) an investigation of the possible relationship between the quality of the pottery (e.g. thickness of the pot walls, amount and size of any tempering agents used), and the degree of sophistication of the kiln in which the ware was fired;[15]

(iv) the whole problem of kiln wastage rates has hardly been touched and the production of any figures will involve the repeated firing of the same kiln with thrown loads designed to 'fit' the kiln. In this way, the particular qualities of the oven would become apparent and steps taken to reduce wastage to the minimum, i.e. valid, figure. Needless to say it should be possible to reduce the very alarming figures in Table 2.

This brief summary has indicated the lines on which experimental kiln firings have been conducted, and much information which should be of use to future kiln excavators has accrued. A word of caution would be wise, for it is impossible to suggest that any one method was that employed by the Romano-British potters. It is clear that potting is a particularly personal occupation—in detail all kilns are unique and without doubt every potter had his own method of building, loading, and firing which would be influenced by such things as his training and the quality of the available clay and fuel.[16] Bearing these limiting factors in mind, it seems valid to suggest that the potter would aim to own a kiln whose building, upkeep, and firing involved him in a minimum of effort and risk whilst ensuring maximum efficiency.

SUMMARY

This article surveys the results of numerous experimental Romano-British kiln firings. These should be of value in the understanding of excavated kilns, the study of the coarse wares produced, and provide some details regarding the economics of the industry.

[15] It is possible that the two varieties of black-burnished ware can be explained in this way—the heavily sand-tempered BB1 ware being known to be fired in clamps, whilst the relatively temper-free BB2 wares may well prove to be kiln fired. (See *Curr. Archaeol.,* 31, 200-02.)

[16] For a fuller discussion of these points, see Shepard, 1956, 213-15.

TABLE 3

Summary of results of experimental kiln firings, 1956-72

Site and Year	Diameter of kiln	Maximum temperature	Time to reach maximum temperature	Length of time of cooling	Fuel consumed	Remarks on pottery	Method used to produce grey ware	Dome
Wattisfield 1956	*c.* 3 ft.	850 °C.	26 hrs.	—	—	'Many examples of grey ware were obtained.'	Fire pushed into oven pit-vent and flue sealed	Temporary
Boston 1 1960	*c.* 4 ft.	Estimated 1,000 °C.	13.10 hrs.	28.45 hrs.	40 cwt.	All pottery oxidized	Vent and flue sealed	Temporary
Boston 2 1961	3 ft. 6 in.	980 °C.	12 hrs. and held for further 5 hrs.	30.7 hrs.	9 cwt.	'Majority of the pots were reduced'	Kiln stoked-vent and flue sealed—water added	Temporary
Leeds 1	*c.* 5 ft. 6 in.	1,080 °C. average *c.* 835 °C.	*c.* 11.30 hrs.	—	—	All pottery oxidized	Vent sealed—greenery packed into flue-flue sealed at *c.* 400 °C.	Permanent
Leeds2	*c.* 5 ft. 6 in.	1,075 °C. average *c.* 845 °C.	10.00 hrs.	—	—	All pottery reduced	As Leeds 1	Permanent
Leeds3	*c.* 5 ft. 6 in.	*c.* 1,150 °C. average *c.* 950 °C.	6 hrs.	—	—	Some pottery reduced	As Leeds 1	Permanent
Barton 1	3 ft. 6 in.	1,010 °C.	11.02 hrs.	6.55 hrs.	4½ cwt.	All pottery reduced	Kiln stoked-vent and flue sealed—water added	Permanent
Barton 2	3 ft. 6 in.	980-1,000 °C. by cones	5.50 hrs.	7.50 hrs.	—	All pottery reduced	Kiln stoked—vent and flue sealed	Permanent
Barton 3	3 ft. 6 in.	1,000 °C.	10.15 hrs.	12.55 hrs.	5¼ cwt.	All pottery reduced	As Barton 2	Permanent
Barton 4	3 ft.	*c.* 900 °C.	9.35 hrs.	11.15 hrs.	4 cwt. 92 lb.	All pottery reduced	As Barton 2	Temporary
Barton 5	3 ft. 9 in.	930 °C—average temp. 715 °C.	11 hrs.	9.15 hrs.	5 cwt. 74 lb.	Some pottery reduced	As Barton 2	Temporary
Barton 6	3 ft.	880 °C.—average temp. 800 °C.	9.15 hrs.	*c.* 15 hrs.	3 cwt. 90 lb.	All pottery oxidized	As Barton 2, but without carefully sealing with wet clay	Temporary

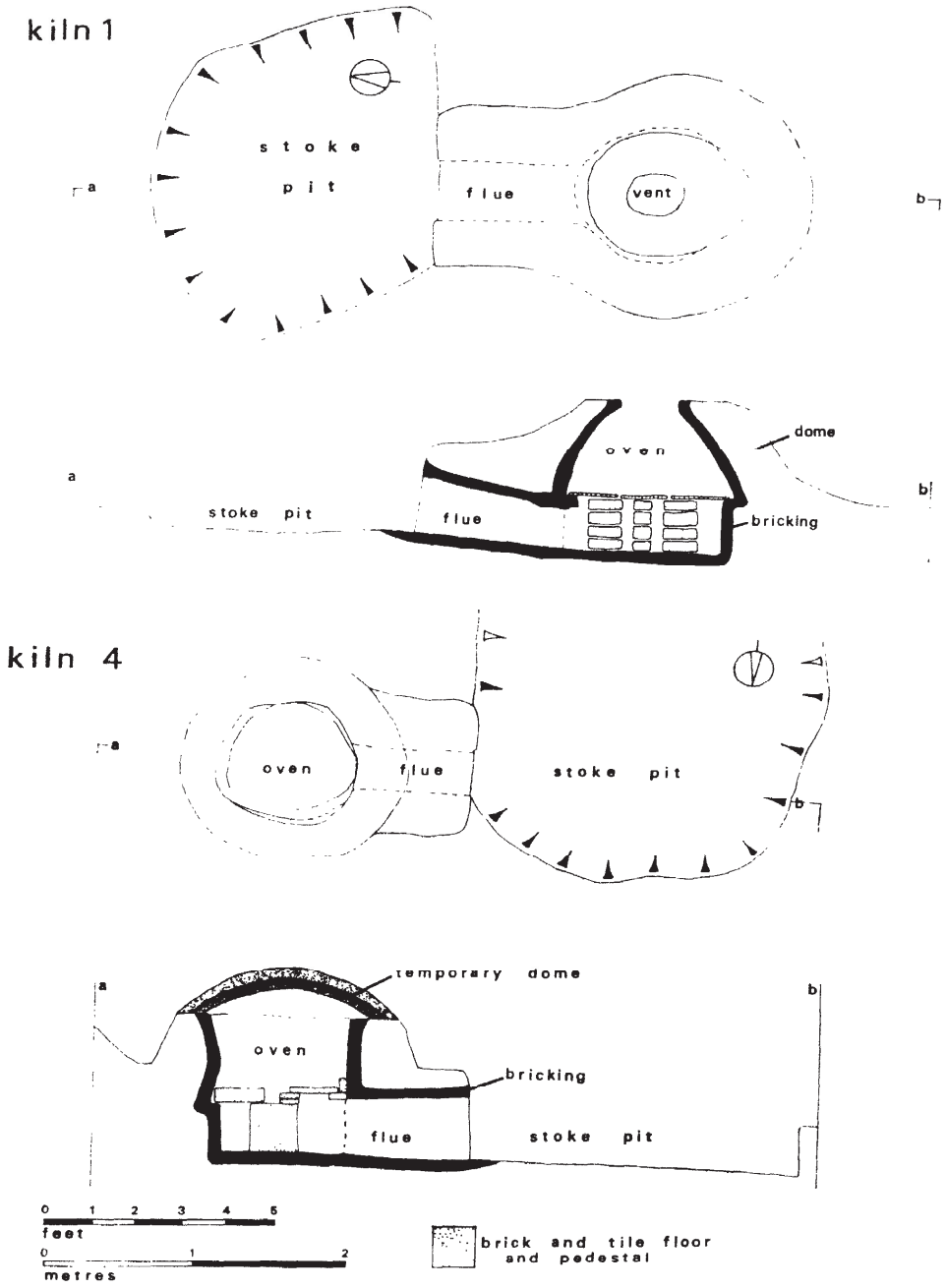


FIG. 1. Barton-on-Humber, Kilns 1 and 4.

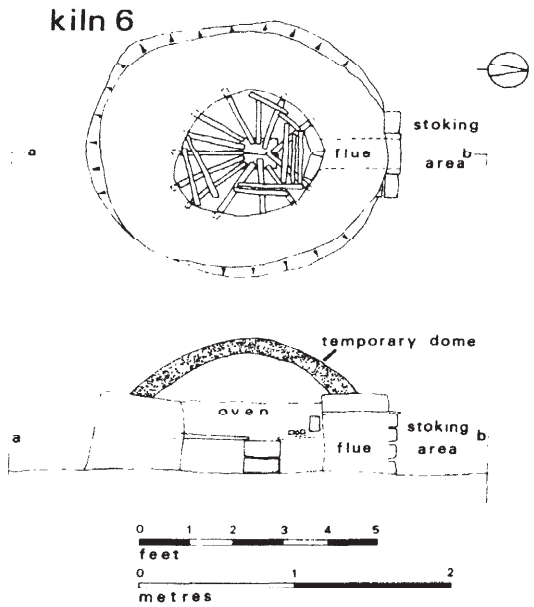


FIG. 2. Barton-on-Humber, Kiln 6. The above ground, turf-built Kiln.

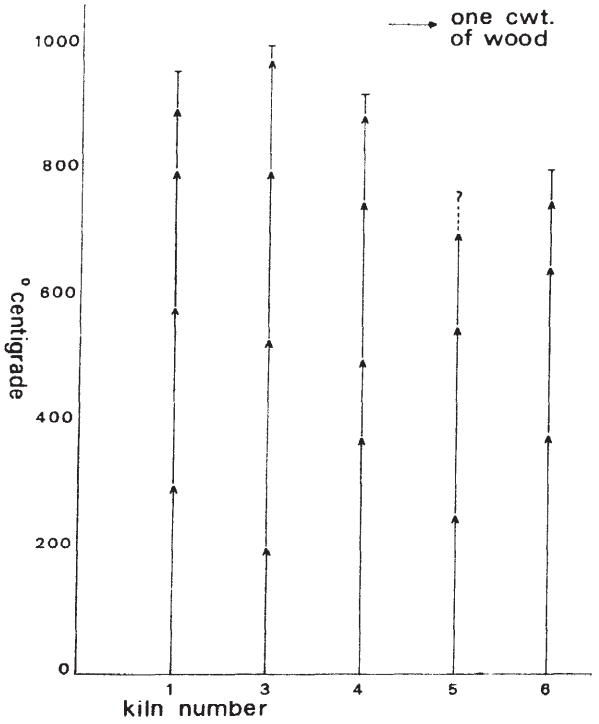


FIG. 3. Details of Relationship between Fuel consumed and Heat generated in five Kiln Firings at Burton-on-Humber,

SUMMING UP

GRAHAM WEBSTER

THE Oxford Conference was a highly successful enterprise. It brought to light much recent and current work which reflects a growing interest in the subject which had for some years been fairly dormant. It is now fully appreciated that it is a vast area of study, which can only be attacked at carefully selected points. This becomes apparent from the reports above. The main research has been confined to the production and marketing and to the study of wares of a particular industry in all types of pottery which can be identified and traced back to the centre of manufacture.

When the conference was planned it was decided that the contributions would not be published, since they were reports of work in hand, rather than considered evaluations of completed research. But this was overwhelmingly rejected at the final session. Most of those attending felt very strongly that the reports were so valuable and, to many. so full of new ideas that this volume should be produced by the C.B.A. This decision made it difficult for some contributors who had not come to Oxford with a prepared script, which could be handed over to an editor. It says much for their goodwill that all the reports were put so quickly into shape. Had the matter been otherwise, some of them would have been different, but it may be argued that it has produced a welcome absence of heavy academic overtones. One of the most valuable contributions to the Conference was the exhibition of large collections of pottery, which made it possible for pieces to be handled and compared. This was especially useful in the cases of New Forest and Oxford products and the various categories of black-burnished wares. We are most grateful to those who brought all this pottery and arranged the display.

The experimental kilns built by Geoffrey Bryant and others have been especially important in the development of two new possibilities. Excavators in the Nene Valley, Peter Woods, Geoffrey Dannell and Dr. J. P. Wild, have been puzzled by circular and oval areas of scorching, associated with charcoal scatters. It is now evident that many of the kilns of the early occupation were of a surface type which leaves only those slight traces on the ground. The apparent total absence of pre-Conquest kilns strongly suggests that they were all of this type. That the method continued may be demonstrated by the failure to locate the very large industry for black-burnished wares, and this now only remains to be proved in Dorset and Somerset. The other idea is that the upper part of the fully developed kilns was cylindrical in form and not dome-shaped. This has a considerable bearing on any calculations of the kiln load, an area of experimental and statistical analysis which must now be undertaken.

Of special interest is the work now proceeding on the problem of the identification and distribution of Oxford and New Forest wares. This has helped to remove the imbalance created by Heywood Sumner in his copious and delightfully individual publication of the latter (Sumner, 1914 and 1927). It is now apparent that the Oxford wares are of far greater importance and that many of the New Forest types had a very local distribution. One of the most enigmatic products in Britain has always been the black-burnished wares which are so universal and thus so vital for dating. The contribu-

tion of Raymond Farrar is particularly welcome and one hopes that this will stimulate more field work and investigation of the production centres in close association with more scientific examination as so brilliantly exemplified by Dr. Peacock.

It has been evident to those closely in touch with the subject that the large army contracts add a serious complication to the distribution pattern of some of the wares and form a contrast to the normal flow of pottery to the civil markets. John Gillam has done many years of perceptive research on these problems in northern Britain and, taken with the enormous amount of valuable specialist work on mortaria by Mrs. Hartley, has continued to advance our knowledge materially. After reading their reports, one must hope that students will use John Gillam's classic work with more understanding and discrimination.

The Nene Valley was the largest single area of production in Britain as almost continuous work there since 1958 has shown. Those involved have begun to appreciate not only the scale of the industry but also that there was a very large number of different products. Almost every new kiln produces new and hitherto unknown wares. It is unfortunate that the rate of publication has not matched that of the excavations, but it is good to see even a few scraps now in print and they must whet the appetite for more.

Perhaps the greatest advance in knowledge has come with the wares associated with the Conquest. Miss Rigby and Kevin Greene have explored a fertile area with spectacular results. If one links this with the parallel studies in samian and the different kinds of Arretine ware, from Italy and Gaul, the great advance in knowledge can be appreciated. The extent and spread of pre-Conquest pottery imports into Britain, however, remains an open question, but apart from a limited area in the south-east and, possibly, the south coast, it seems to have been a modest trade. This is an area of research which should be encouraged.

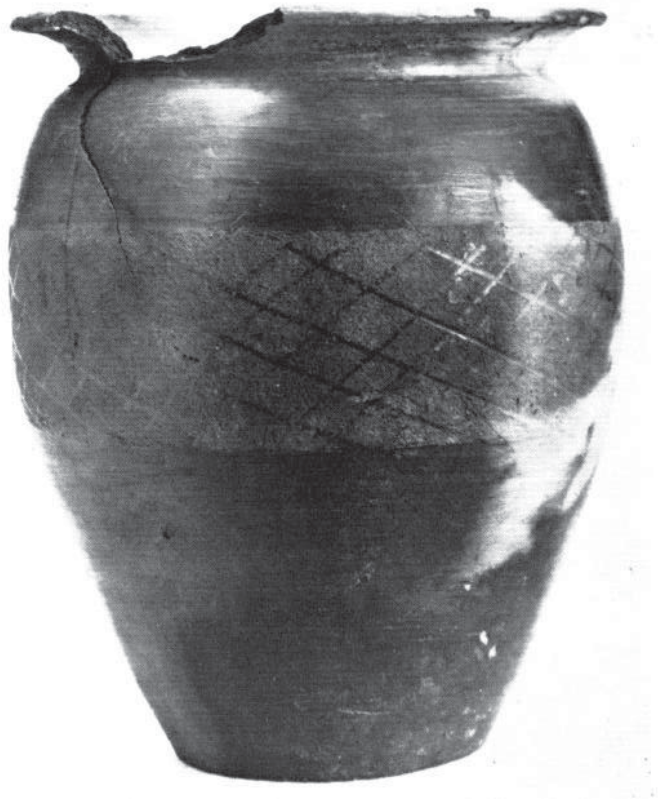
The Conference has shown the extent and value of the surge of new interest in Romano-British coarse wares. It has long been felt that more co-operative effort was required, and it is hardly surprising that one of the results of this Conference, at the planning stage,[1] has been the creation of a Study Group on the subject by those most intimately concerned with it. This should enable the work to be continued under the stimulus of joint effort and lines of research paths laid down and co-ordinated. This is essential for the subject itself, but the main outcome will be greater refinements in the identification and dating of the wares so essential for the study of the archaeology of the period.

[1]For historical accuracy, the Study Group resulted from a meeting at Pendrell Hall, near Wolverhampton, in March 1971, arranged by the Extra-Mural Department of the University of Birmingham at the request of the Iron Age and Roman Research Committee of the C.B.A. The meeting was by invitation, and it was the task of those assembled to produce a programme for the Conference which would reflect the research currently being done.

General Index

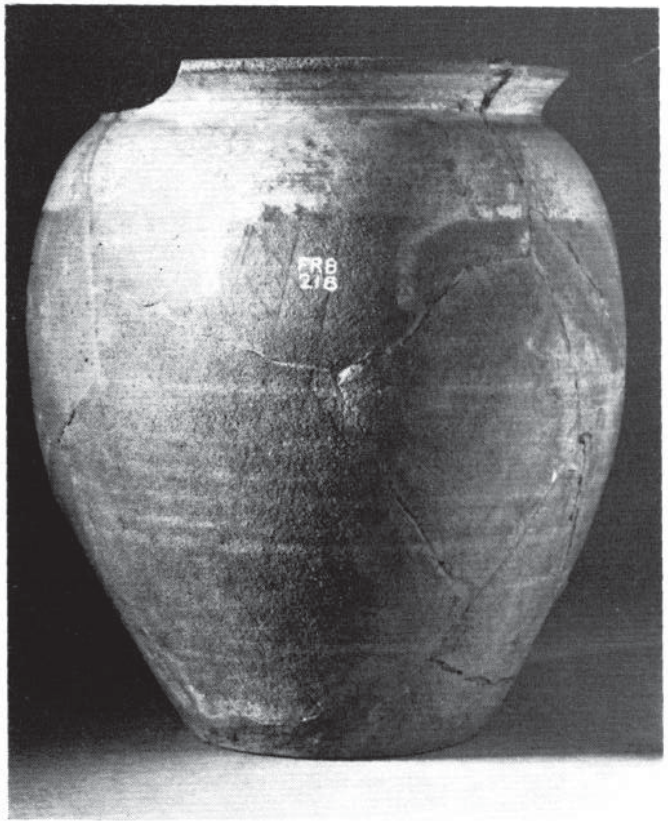
PLATE I

A. Black-burnished Cooking-pot of Category 1, Stoborough, near Wareham, Dorset (Height 15.8 cm.; photo. L. D. Frisby).

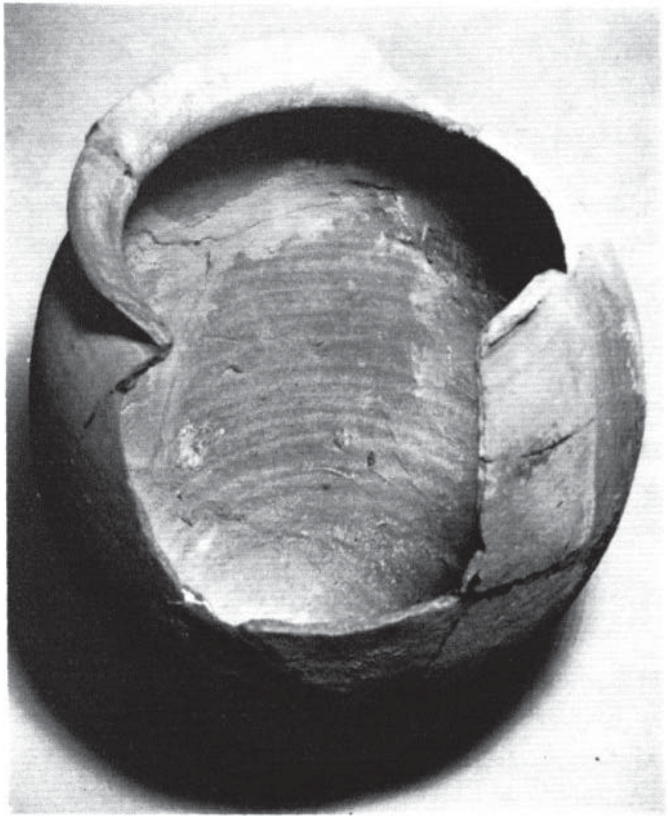


B. Black-burnished Cooking-pot of Category I, Redcliff. near Wareham, Dorset (Height 18.5 cm.; photo. Royal Commission on Historical Monuments, England; Crown Copyright).

PLATE II

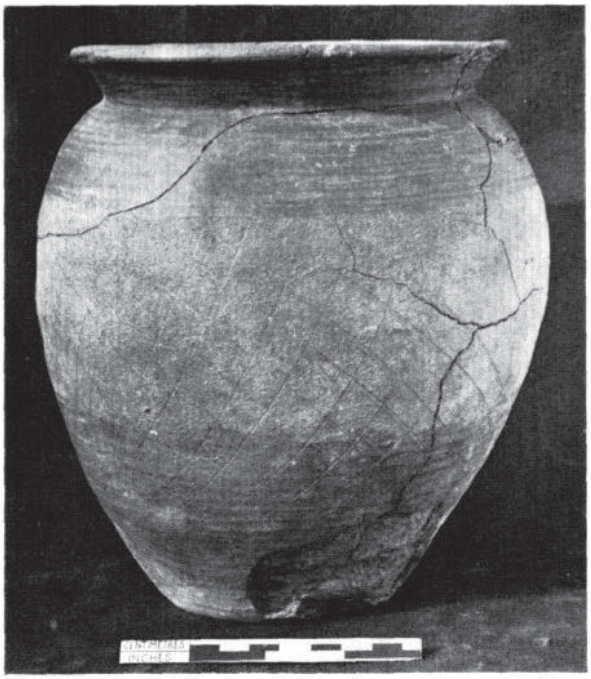


A. Black-burnished Cooking-pot of Category 2, Mumrills, Stirlingshire. (Height 22.4 cm.; photo. National Museum of Antiquities of Scotland)



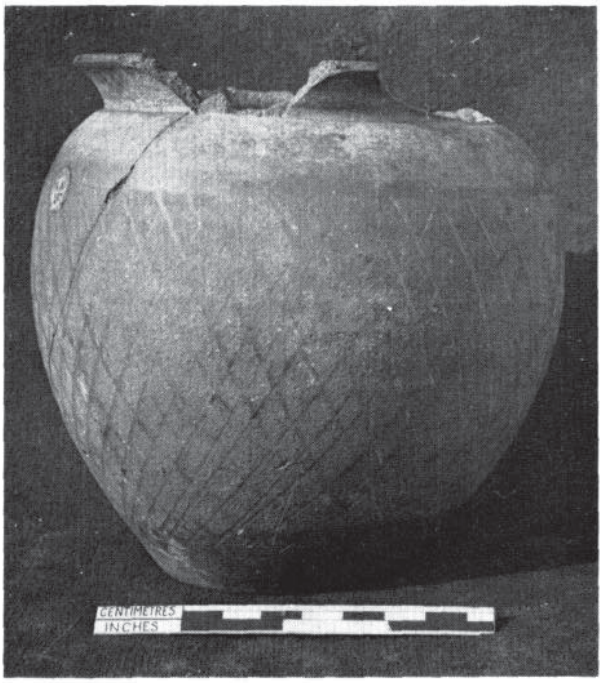
B. Interior, showing Wheel-corrugations (photo. National Museum of Antiquities of Scotland).

PLATE III

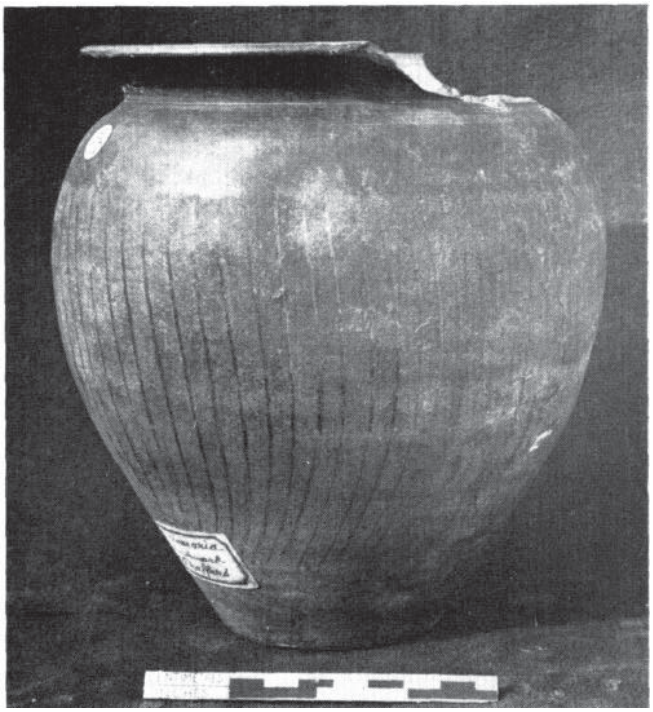


A. Cooking-pot of Category 1, Dorchester, Dorset (Height 22·5 cm.).

B. Inner Faces of late Cooking-pots of Category 1, Corbridge and Dorchester.



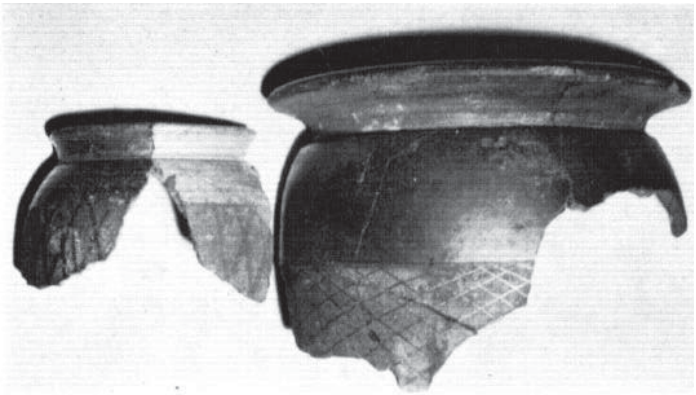
C. Cooking-pot of Category 2, London (Height 15·2 cm.).



D. Cooking-pot of Category 2, London (Height 19·5 cm.).

PLATE IV

A. Cooking-pot of Category 1, with Slip or Slurry Finish, Redcliff, near Wareham, Dorset.



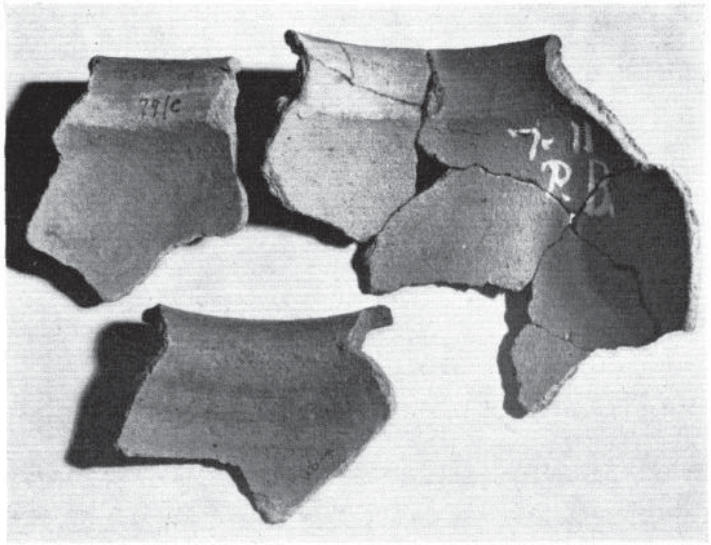
B. Wheel-thrown black-burnished Cooking-pots, London.

C. Modern Turkish Casserole, Sorkun.

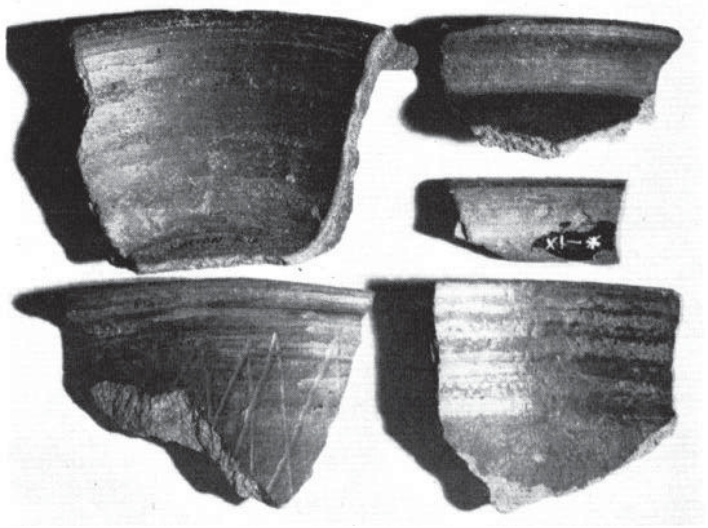
D. Dish of Category 1, Redcliff, near Wareham, Dorset.

A. Cooking-pots of Category 1 from Milecastle 48, Cumberland, and Dorchester, Dorset

B. Cookintpots of Category 2 with yellow slip and black slip, Rough Castle and Ardoch (left), and Corbridge (right).



C. Cooking-pots in 'grey-burnished' Ware, Milecastles 79 and 48, and in wheel-thrown grey Ware, Corbridge below.

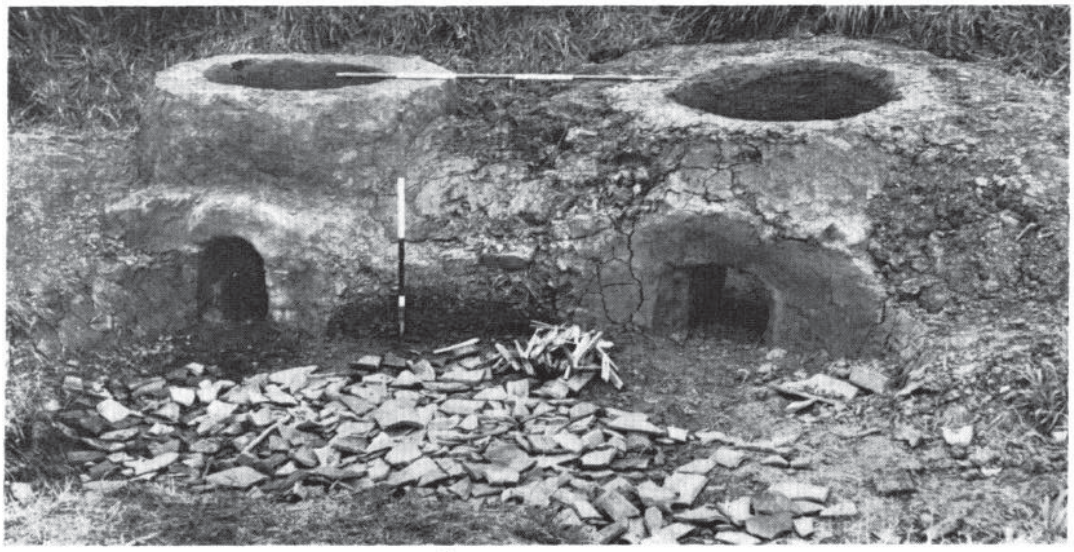


D. Rims of black burnished Fabrics, Colchester and Birdoswald (left), Corbridge and Richborough (right).

PLATE VI

Barton-on-Humber, Kiln 1. The Firings number 1-3 took place in this Kiln. *Photo. H. Atkinson*

PLATE VII



Barton-on-Humber, Kilns 4 (on left) and 5. *Photo: H. Atkinson*

PLATE VIII

Photo: H. Atkinson

Barton-on-Humber, Kiln 6 towards the End of the Firing with Turf Dome covering the Load.