A Romano-British Pottery Kiln at Claxby, Lincolnshire: Excavation, Discussion and Experimental Firings

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SUMMARY

One of a group of pottery kilns was excavated at Claxby, Lincolnshire. The kiln had a raised oven floor supported by three pedestals, a long flue, and a stokepit which contained a small ash pit immediately in front of the flue mouth. A narrow range of domestic grey wares was produced. Other kilns of similar form are discussed and three experimental firings are reported.

THE EXCAVATION

The kiln is situated in the northern part of the parish of Claxby, Lincolnshire (NGR TF 100961). It is one of a group of at least six kilns but being until recently under a hedge was the only one not badly damaged by ploughing. This small group may be part of the fairly extensive industry (see Fig. 1) located on the moors which flank the western edge of the Lincolnshire Wolds between Caistor and Linwood.

Kilns have been excavated at Linwood, but the sites at Walseby, Othy, Risby and Caistor are only known at present from field walking (see Fig. 1, Map 2). The dating and duration of the industry is largely unknown.

There was extensive occupation in the area during the Romano-British period (see Fig. 1, Map 2). The town of Caistor, the villas at Claxby and Walsby, and other smaller settlements nearby, would have provided an immediate market. The Roman roads which leaves the Ermine Street at Owston and runs in an north-easterly direction to join the Caistor-Horncastle High Street road to the north-east of Normany le Wold passes within a couple of miles of the Claxby kilns and may have allowed the potters to use the Lincoln market. Similarly the road which is thought to run to the south of Market Rasen could have served the potters in that area.

The Claxby kiln site lies on a slight rise at approximately 130 feet O.D. This is an area of blown or cover sands, emplaced during the last glaciation, over Upper Jurassic Kimmeridge clay. The sand has been subject to blowing in historic times which accounts for its uneven thickness and for the presence in the area of 'windows' which expose the clay on the surface. The stones in the kiln structure were no doubt easily available as blocks in the land slips at the foot of the scar half a mile to the east. The boulder clay capped hills to the west around Owston and Kelsey would have forest cover in Romano-British times, though the sandy areas immediately surrounding the kiln site would be more open with heather, birch and thorns as dominant vegetation.

THE KILN (Fig. 2 and Plates I and II)

The kiln was orientated east-west with the oven to the west. An almost rectangular hole 2.75 m east-west, and 1.60 m north-south had been dug into the natural sand. Because the Romano-British ground surface had been destroyed by ploughing the depth of the original hole is not known, but it was clearly deeper to the east, i.e. the flue end, than to the west. The building materials brought to the site were Kimeridge clay, and stones of Spilsby sandstone, Tealby limestone, and red chalk.

The kiln oven pit was built entirely of clay, and the side walls, where still preserved, had a maximum thickness of 25 cm of clay. The gap which remained between the clay wall and the edge of the foundation trench was backfilled with sand slightly darker in colour than the undisturbed natural. The oven pit floor was covered with a 5 cm thick layer of clay and sloped markedly down towards the flue. The oven pit was slightly oval in shape. The three pedestals were of one build with the oven pit, there being no evidence to suggest that they were pre-fired before being built into the structure. They were asymmetrically placed within the sloping oven pit, and in order to build a horizontal oven floor they had to be taller to the east than to the west (see Fig. 1, section a-b). The southern pedestal seemed to have been slightly damaged by ploughing but in general they still remained intact to their original height. All the clay of the oven pit walls and the pedestals was reduced.

When excavated the debris fill between the pedestals was largely of unbaked clay, pottery and fire bars. The fill to the west of the pedestals was a mass of waste pottery. At the junction of the oven pit and the flue there was a large group of kiln bars. There was virtually no ash in the oven flues or adhering to the pedestals.

The flue was 1.3 m long and 0.46 m wide. It had slightly concave sides and as with the oven pit floor it sloped downwards towards the stoke pit (see Fig. 1, section a-b). The flue checks, which were still standing to a height of 0.3 m were of roughly coursed rubble stone bedded on, and packed with, layers of Kimeridge clay. The inner face of the stoke was covered with a layer of clay 3 - 5 cm thick which had been fired brick hard. Some of this lining still remained in situ, but much of it had fallen off and was found on the flue floor. To the rear of the stone flue checks there was a packing of clay blocks which still retained the form in which they had been brought on to the site. The southern flue check was badly damaged by ploughing.

The flue floor was cut into the natural sand, and along its central line continual raking out had produced a hollow. A layer of black ash 5 cm thick covered the sand for practically the whole length of the flue, and on this lay a mass of bricked and unfired clay, with some pottery, stone, and kiln bars.

The stoke pit to the east of the flue had two distinct elements. Immediately to the east of the kiln facade and dug into the natural sand there was a pit 1.2 m in diameter, and 0.4 m deep. The edges of the pit sloped gently towards the base which had been waterlogged to a depth of some 8 cm. The pit was full of black sooty ash in which there were no signs of pieces of charcoal or pottery. The sand at the sides of the pit showed no signs of burning, and the junction of the ash and the sand was clean, i.e. there was no mixture of the ash and sand at this point. The pit had become overfull and the ash had spilled out and partially filled much of the rest of the much shallower stoke pit.

There was a considerable amount of pottery in this overspill.

DISCUSSION

Consideration of the many reports of excavated Roman-British pottery kilns show that they are almost invariably of the one flued updraught form — the Claxby kiln is yet another example.

Here the oven floor was formed of kiln bars which would have spanned the gaps between the pedestals and the kiln walls. Although no complete bars were recovered during the excavation, examination of the broken fragments indicated that they would have been rectangular in section and slightly tapering at both ends. The use of three pedestals as here is not common, though other examples are known, e.g. at Wappenbury (see Fig. 3 below). The excavation of the debris around the pedestals revealed a mass of pottery at the back of the oven pit. Some of this
Fig. 1  Map showing the location of Claxby and other sites mentioned in the text. Kiln sites: 1 Navigation Lane, Caistor; 2 Normanby Moor; 3 Claxby; 4 Otby Beck; 5 Walseby Moor; 6 Risby Moor; 7 Market Rasen; 8 Linwood.
Fig. 2 Claxby kiln — plan and section.

Plate I The Claxby kiln — oven pit to the left and ash pit, still partially filled, to the right.
seemed to be jars in situ rather than waste pottery which had got into the kiln after it had gone out of use, and it may have been that because of the considerable slope up from the flue to the rear of the kiln, and the fairly wide gap between the pedestals and the rear wall of the oven pit, a raised floor was not needed, and/or not possible to build here, and pottery was fired on the oven pit floor.

The asymmetrical positioning of the pedestals within the oven pit and in relation to the flue is strange and uncommon. It is hard to believe that this was intentional as such an arrangement would not be conducive to a good all-round gas flow within the oven. It can only be suggested that the Claxby potter was a poor surveyor!

No dome fragments were found among the debris within or around the kiln and it is therefore likely that this was an open-topped kiln. The load of pottery stacked in the oven would have been clamped with some temporary doming material such as waste pottery, turves, clay and earth.

The long flue and the stoke pit arrangements, and the method of firing the kiln will be discussed below.

A consideration of Romano-British pottery kilns in general shows that the methods used to support the raised oven floor vary enormously, defy a meaningful typology, and do not suggest a variety of techniques associated with firing the kilns. A consideration of kiln flues and stoke pits reveals that there are basically two forms:

1. The short flue — here the flue is little more than a tunnel through the thickness of the oven-pit wall with perhaps a short extension into the stoke pit.

2. The long flue — here the flue is significantly longer, its length often roughly corresponding to, or being even longer than, the internal diameter of the kiln oven.

During the building of the experimental kilns at Barton-on-Humber it was constantly found that one of the most difficult parts of the work was the construction of the flue, and that this part of the kiln required a lot of repair when a kiln was used for numerous firings. The construction of the flue on the long flued Romano-British kilns would then be initially difficult, and later repairs and relining would not be easy. Further it is clear that the temperature required to fire the earthenware produced in these kilns can be achieved with a short flue. The kilns are not of such a large size that the long flue would be required to accommodate large amounts of fuel necessary to fire large amounts of pottery. To take but two examples, at North Hykeham, a kiln c. 1.5 m internal diameter was fired with virtually no flue, whereas at Swanpool a much smaller kiln, only c. 1.13 m internal diameter, had a flue 1.8 m long.

Within the group of long flued kilns there are a number, of which the Claxby kiln is an example, where a pit was dug at the junction of the flue and the stoke pit. This pit will be referred to as the ash pit to distinguish it from the stoke pit proper. Other kilns with a long flue and ash pit have been found at South Carlton, Swanpool, Lincoln Racecourse, Lincoln Rookery Lane, Lockington and Wappenburg (see Fig. 3). Consideration of the oven pit arrangements in these kilns shows that various methods of supporting the oven floor were used but in each case the kiln was fired through a long flue with an ash pit.

At South Carlton two long flued kilns were excavated, but only kiln B had an associated ash pit. Although no detailed description of the fill of this pit was reported it is perhaps significant that it was referred to as ‘the ash pit’, and further that very little pottery was found in it. At Swanpool the report shows an ash pit full of ‘black ash and kiln debris’ which had spilled over into the flue and stoke pit. The Lincoln Racecourse kiln had an ash pit full of ‘soot’ dug into the natural sand. The fill of the ash pit at Lockington is described as ‘a black gley mixture of wood ash and broken pottery’, and again this fill had spilled into the kiln flue and oven pit, and the stoke pit. At Wappenburg four kilns with ash pits were reported. In kilns one and two the flues were not of typical long tunnel-like form, and did in fact more closely resemble the short flued kiln type. But the distance between the pedestal and the flue led the excavators to assume that this could not have been spanned with a normal kiln bar and that ‘the front of the furnace chamber acted as a flue, while pottery was packed only to the rear of the chamber’. Kiln three, and possibly kiln four, had a typical long flue with associated ash pit. The only mention of a fill in the pits was in the case of kiln one where ‘ashes’ were noted.

At Swanpool, Lincoln Racecourse and Rookery Lane, Lockington, Wappenburg and Claxby the flue sloped down into the ash pit. This slope does not seem to have been an
original feature but was the result of continual raking of the flue which in many cases had cut below the bottom foundation course of the flue walls.

It is clear that these kilns were not associated with the production of particular types of wares. Mortaria, flagons, rough cast beakers, coarse ware jars, bowls, dishes and black burnished wares were produced in oxidised and/or reduced firings.

Again the kilns were not peculiar to a particular period and their use in the second, third and fourth centuries is recorded.

In a recent summary of experimental firings of Romano-British pottery kilns it was noted that 'the reason(s) why some kilns have long tunnel-like flues, and others short flues are at present unknown'. It is now necessary to further question why some of the long flued kilns have an ash pit. Two possible answers are immediately available:

1. that here is another variation of the form of Romano-British updraught pottery kilns, of no technological significance, and merely reflecting once again that in many of the minor details of kiln construction and firing, e.g. oven form, oven floor support, and flue length, potters were taught or discovered through personal experience, a kiln form which suited them best.

2. that there were differing techniques associated with the firing of short flued, long flued, and long flued with ash pit kilns. The experiments described later were undertaken in order to understand better the firing of the long flued, and the long flued with ash pit, kilns.

THE POTTERY

The pottery discussed here was found in the kiln oven, flue and stoke pit. As the main waster heap was not located the possibility exists that the full production range was not discovered. The evidence available from this limited deposit indicates that four forms of vessels were produced: wide and narrow mouthed jars, bowls and dishes. The statistics given below show that the wide mouthed jars, the bowls and the dishes accounted for the vast majority of the waste pottery recovered. This may indicate that these were the majority products of the kiln but it should be noted that the most time-consuming products were probably the decorated jars with upright rims (Fig. 4, nos. 3-5) and it may be that these were placed in the safest parts of the kiln and a low wastage rate resulted.
The pottery was thrown on a fast wheel and the jars show clear evidence for the use of a smoothing tool on the outside. For the body of the pots this may have simply been a cloth or leather held in the hand, but at the rim a more solid tool perhaps of wood or bone was used, and over which the rims were turned. The inside surfaces of these jars still retain the hand-made throwing rings. Further work with a tool produced the shoulder grooves on the wide-mouthed jars and the burnishing employed on some of the vessels. All the pottery was made from a clay very heavily tempered with fine sand, and where unburnished the vessels are friable and very coarse to the touch. Where burnished a smooth surface is obtained. The forms produced were as follows:

1 Wide mouthed jars (Fig. 4, no. 1)
These were produced in a variety of sizes with rim diameters varying from 20 to 35 cm. In all cases the outer body of the pot was smooth and the inside still retained the throwing marks. The rim had been turned over a tool which showed in the junction of body and rim on all the pots.

2 Narrow necked jars with upright rims (Fig. 4, nos. 3-5)
No full profile of this type of vessel was recovered. The evidence available shows them to have upright rims with external rilling though on numerous examples this is very indistinct. The inner side of the rim may have served as a lid seating. The shoulder of the vessel is decorated with rouletting (Fig. 4, no. 3) or rilling (Fig. 4, nos. 4 and 5)

3 Narrow necked jars with everted rims (Fig. 4, nos. 6 and 7)
Again no full profile of this type of pot was recovered. The jars are undecorated and unburnished.

4 Rolled and flanged rimmed bowls (Fig. 4, nos. 8 and 9)
The rolled rimmed bowls (Fig. 4, no. 8) are from 19 to 21 cm in diameter and stand 7.5 to 8.5 cm high. Where not burnished, which is generally the case, they have the typical coarse, sandy texture. Decoration is very sparse —
A ROMANO-BRITISH POTTERY KILN AT CLAXBY, LINCOLNSHIRE.

lincolnshire and it is therefore possible that the kiln was in production in the late 3rd century. A more precise date must await the publication of groups of dated pottery recovered from occupation sites in the area.

THE EXPERIMENTS

Three experimental firings of replica Romano-British long flued pottery kilns were undertaken in 1974 (kilns 7 and 8), and 197512 (klin 9). The experiments were the result of courses organised by the Barton-on-Humber branch of the Workers' Educational Association and the help and encouragement of all the members of the classes is gratefully acknowledged. 13

The kilns were built at the Hoe Hill Tile Works, Barton-on-Humber (NGR TA 038234).

Kiln 714 — the kiln built was, in plan, a full scale replica of the kiln excavated at Claxby (see Fig. 2 above). It was not, however, sunk below ground level, but was built entirely above ground. The oven pit and the oven walls and the flue cheeks were built of turfes dug at the site and coated internally with a thin layer of clay. The flue arch was formed over three pre-fired ridge tiles, and the pedestals were of brick.

Discussion within the group had produced the suggestion that these long flued kilns may have been fired with charcoal, and further that the purpose of the long flue was perhaps to hold sufficient charcoal to allow a one charge firing, i.e. that all the space around the pedestals and the whole volume of the flue had been packed with charcoal which was then slowly fired without the addition of any more fuel during the firing period. One charge, charcoal fueled, reduction firings for the production of iron are known from the Romano-British period15 and took place in bowl furnaces built partially below ground. Could this technique be used in a pottery kiln? The purpose of this experiment was to test this possibility.

200 lb. (93 kg.) of charcoal was packed into the kiln oven pit and flue, the pottery was stacked on the oven floor and clamped with tiles, turfes and clay, and the flue was sealed except for a small air vent at the base.

one bowl showed traces of vertically burnished lines.
Number of rim sherd recovered: 59
Weight of rim sherd recovered: 7 lb. (c 3.2 kg.)
The flanged bowls (Fig. 4, no. 9) have a similar size range as the rolled rimmed bowls and are again generally burnished all over. None show signs of decoration.
Number of rim sherd recovered: 35
Weight of rim sherd recovered: 3 lb. (c 1.4 kg.)

5 Shallow, straight sided, rimless dishes (Fig. 4, no. 10).
These are a fairly standard shape though they vary in size from 17.5 to 25 cm in diameter and are 4 to 6 cm high.
Once thrown the dishes have been knife trimmed to round off the exterior angle at the base. They show considerable evidence for burnishing which gives the vessels an almost metallic appearance. The decoration on the interior of the base is of burnished lines in 'sun-ray' form. The lines are either in groups of four, or symmetrically spaced as wheel spokes. These lines are then cut by a centrally placed burnished 'hub' and three or four concentric rings.
Number of rim sherds recovered: 86
Weight of rim sherds recovered: 7 lb. (c 3.2 kg.)

DATING

The dating of the Claxby kiln is extremely difficult. No dateable non-local pottery, coins, or metal objects were found in significant positions during the excavations. No Claxby pottery has been found in dateable contexts on sites in the area. One is left then to attempt dating through a study of the manner in which the Claxby pottery 'fits' the general typological development of coarse wares in northeast Lincolnshire. Again the lack of published groups of pottery from the area around Claxby means that one must assume that the nearest available typology, i.e. that in the Lincoln area, is relevant to the Claxby material. This is a very hazardous assumption. Even bearing these grave reservations in mind it is only possible to suggest one group of Claxby pottery which could hint at a possible date - these are the flanged bowls. The flanges do not seem to be pronounced enough to justify a 4th century date in

800
700
600
500
400
300
200
100
0

BARTON KILN 7

position of thermocouples

Fig. 5 The firing of kiln 7.

time in hours

Fig. 5 The firing of kiln 7.
The progress of the firing is shown in Fig. 5. The charcoal burning down the flue slowly raised the temperature at the front of the oven (1) but had no noticeable effect elsewhere. Only when the charcoal within the oven pit ignited were there really noticeable, indeed spectacular, results. One by one the thermocouple temperatures rose very quickly as the nearby fuel burnt. This application to green ware of too much heat too quickly did not allow the water held physically and/or chemically in the clay to be gradually released as steam, and piece by piece the pottery exploded.

Thermocouples 1 and 2 recorded a temperature of over 700°C before they began to fail, but thermocouple 4 only reached 560°C, thermocouple 5, 380°C, and thermocouple 3, at the rear of the kiln, 413°C.

After 5½ hours firing it was clear that all the charcoal had been burned and the kiln was sealed for cooling and hopefully reduction. The kiln was opened after a cooling period of 12 hours 45 minutes and it was found that the pottery was largely broken, wholly oxidised, and wholly underfired. It was also of interest to note that the quantity of ash residue removed from the flue and around the pedestals was very small indeed, the fuel had almost totally burnt away.

In conclusion there was no evidence from this experiment that the long flued kilns, indeed any pottery kiln, could be satisfactorily fired in this manner, though many more experiments will be needed before charcoal firing can be dismissed as a Roman-British technique of kiln firing. The minute ash residue from the firing in no way corresponds with the evidence from kiln sites where large amounts of black ash are recorded. The low temperature achieved was clearly not sufficient to produce fired wares, and far more control over the combustion of the fuel would be necessary to avoid the sudden leaps in temperature which wasted the pottery. It may be that a kiln built partially below ground and/or with much less porous walls than the turf built ones used here would produce reduced wares.

Kiln 8 — a replica based on the kiln excavated at Swangle (see Fig. 3) and as kiln 7 was totally above ground, had turf build walls, and used bricks and tiles for the construction of the pedestals and flue arches.

The purpose of this experiment was simply to study the performance of a long flued kiln fired in the normal manner with wood fuel and hopefully producing reduced pottery.

Before firing began the pottery was loaded in the oven and then covered with a layer of tiles underlaying a layer of turves. An exhaust vent was constructed in the rear of this clamp dome.

Details of the firing are shown in Fig. 6. The positioning of the exhaust vent at the rear of the oven was immediately seen to be of value and the temperature rose steadily in all parts of the oven. The long flue initially produced a good draught but as the firing progressed the build up of ash in the tunnel did become something of a problem, and raking out was found not to be as easy as in the kilns with shorter flues. The kiln was fired for 8½ hours and as is usual in these kilns the highest temperatures recorded were at the junction of the flue and the oven pit (1) and the lowest temperatures were at the back of the oven (4). The total amount of wood used was 3 cwt. 60 lb. (180 kg). Prior to the final sealing the kiln was stoked with fuel. After cooling for 12 hours the kiln was opened. All the fuel in the flue and oven pit had burnt away and only a very small amount of ash was recovered. The reason for this was not hard to find for large holes had appeared between the...
Plate III Experimental kiln number 9 loaded prior to firing.
turves of the kiln wall which had obviously allowed large amounts of air to enter during the cooling period and kept the fuel burning. It was not surprising then to find that the pottery, though satisfactorily fired, was 100% oxidised.

The sixth, seventh and eighth Barton kilns have all been above ground, turf built kilns and have all produced oxidised wares. It is now clear that if such a kiln is to produce reduced wares, and there is no technological reason to suggest they could not, great care must be taken to ensure that the walls and flue tunnel are as air tight as possible. This has never been done at Barton where it has merely been shown that the kilns are very easy to build and fire, and will produce good loads of oxidised ware. In previous firings at Barton it has been the practice to form a clamp dome by first laying tiles over the pottery and then, at a much later stage, seal these tiles with turves and clay. The placing of the turf layer was delayed because it was feared these would burn away if exposed to a long period of firing. The firing of the eighth kiln has shown this not to be the case, for the turves withstood the whole of the firing and were in fact in good enough condition when removed to have been used again. The better seal on the dome which the turves ensured throughout the whole firing cycle should have produced a saving in fuel by preventing heat loss through the tile layer. Though this saving is impossible to show statistically, it is interesting to note that the amount of fuel burnt in this kiln, 8 cwt. 60 lb. (180 kg.) was in fact the smallest amount ever used in a firing at Barton.

The efficacy of the rear, rather than central, exhaust vent was clearly demonstrated. There was no sign of the 'cold spot' at the rear of the oven which is always noted when a central vent is used.

Kiln 9—(Fig. 7) was another long flued kiln but this differed from kilns 7 and 8 in various respects. The oven pit and flue were sunk below ground level into the clay subsoil of the site, and the oven walls were built up of clay blocks, beaten into form with a wooden mallet, and allowed to dry out for three weeks. Any cracks which appeared in the walls were sealed.

The purpose of this experiment was to note particularly any possible effects and uses of an ash pit at the junction of the flue and the stoke pit.

Before the firing began the kiln was loaded with 73 thrown pots (see Plate III) and these were covered with a layer of tiles. A pit was dug immediately in front of the flue (see Fig. 7, section). Again a gap was left at the rear of the tile cover to act as an exhaust vent. It will be seen that the pots were heaped well above the height of the kiln walls which did in fact rise only 25 cm above the oven floor. Details of the firing are shown in Fig. 8. A moderately strong north-east wind blew during the whole of the firing period. A layer of turves was placed over the tile cover during the first hour of the firing.

The kiln fired very well indeed; there was never any problem with the draught, and controlling the fire proved very easy.

The ash pit undoubtedly was a help during the early stages when it was still possible to stand in it and load fuel up the flue. As with kiln 8, during the later stages (above c. 700° C) the flue tended to become rather choked with ash which was difficult to remove from the oven pit end of the flue. Raking the ash out of the flue into the ash pit meant that in many ways the problem was increased because of the intolerable heat at the mouth of the flue and it was necessary to empty the ash pit periodically and throw the red hot contents into the stoke pit.

It proved easy to reach an average oven temperature of over 800° C (i.e. an average of the four thermocouple readings after 6 hours 45 minutes firing) and the last 2 hours of the firing were spent vainly endeavouring to raise the temperature. Variation in the size of the exhaust vent, positioning of baffle boards alongside the flue to direct the wind into the kiln, and continual raking out and stoking produced no noticeable results but did ensure that the pottery was 'soaked' in a high temperature for this period.
Fig. 8 The firing of kiln 9

After 8 hours 50 minutes firing it was decided to seal the kiln for cooling. As much fuel as possible was pushed up the flue, including the large amounts of charcoal ash which had by this time collected in the ash and stoke pits. The flue and dome were sealed with wet clay. The total amount of fuel used was 3 cwt. 100 lb. (196 kg.).

The kiln was allowed to cool for 14 hours during which time any large cracks which appeared in the dome or flue seals were plugged with wet clay.

When the kiln was opened the pottery was found to be 100% reduced and very well fired. Eleven of the pots were wasted, (i.e. c. 15%) though it is certain that some of these could be regarded as saleable 'seconds'. A vast amount of black ash and charcoal were recovered from the flue and oven pit.

It has to be said that some of the conclusions reached after firing these long flued kilns (i.e. kilns 8 and 9) were subjective. It certainly seemed to the group that these were 'nicer' kilns to fire than the short flued kilns. Stoking seemed easier and it certainly was easier to obtain an even temperature distribution within the oven, though it should be said that this latter was probably due more to the use of the rear exhaust vent than any skill of the firers. The ash pit proved of value at some times, for example early in the firing when it was still possible to step into it and look up the flue to check the state of the fire. But it was more of a nuisance later when raking out had filled it with red hot ash and it proved difficult to approach the flue at all.

In conclusion it must be said that what uses were noted for the long flue and the ash pit were of marginal technological significance. The evidence obtained from the experiments suggests that long flued kilns are not accompanied by a technology different to that used in firing short flued kilns. It seems far more likely that whether a potter fired with a long flued or a short flued kiln depended on his particular training and experience, i.e. the decision was as much subjective as objective.

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FOOTNOTES

1 The kiln was found during field walking by Mrs. Joan Mostyn Lewis. Permission to excavate was kindly given by Mr. T. J. Lyle of Claxby Grange who gave every help and encouragement to the work. The finds are deposited at Grange Farm, Claxby.
3 Information kindly supplied by Mrs. J. Mostyn Lewis, and also see Lincolnshire History and Archaeology, No. 1, (1966), pp.46-47.
6 J. B. Whitwell, op. cit., p.54.
7 This geological report was kindly written by D. N. Robinson.
examine the institutional framework inherited by the Established Church in ten studies grouped under the headings of personnel, finance, 'the New Foundations', and 'the Courts Christian'. The minority who clung to papal supremacy withdrew from this institutional framework.

Dr. Bossy describes how an indigenous English Catholic community slowly came into being, examining every aspect of its life from its origins in the launching of the English reformation in 1570 to the restoration of the hierarchy in 1850. Both books open up new perspectives by viewing the historical process from the localities. Dr. Bossy draws on recent regional studies and Continuity and Change uses local ecclesiastical archives.

In the Established Church a significant reform was in recruitment to the ministry, which in 1558 was from the uneducated but by the early seventeenth century from graduates. The implications are discussed by Dr. O'Day. She also considers ecclesiastical officialdom in a chapter on the increasing influence of the registrar in diocesan administration, which draws on correspondence at Lincoln. The crown continued to use the bishops as collectors of clerical taxes after the Reformation and Dr. Heal describes the unfortunate consequences of holding them personally accountable for taxation which the clergy no longer voted. The new foundations studied are the Durham Chapter, where the new dignitaries represented an improvement in calibre, and the dioceses of Chester and Peterborough where inadequate endowment had lamentable results. Ecclesiastical jurisdiction declined under the Tudors and the causes are discussed, though it is shown that in Chichester diocese the courts were reformed in the early sixteenth century and, as at Lincoln, became their most effective in the 1520s. The Prerogative Court of Canterbury was another exception, and there is a useful account of its practice and procedure in the sixteenth century. All who study the Anglican Church in this period can learn from these essays.

Dr. Bossy's thesis, which he brilliantly justifies, is that post-Reformation Roman Catholicism in England belongs to English dissent and cannot be identified with pre-Reformation Catholicism. In place of the traditional assumption of a continuous reduction in numbers of English Catholics from almost total acceptance of the faith in the early sixteenth century to near extinction in the mid-eighteenth century, he reveals a small community, in most respects a new creation, but able to claim continuity with the past, slowly growing after 1570. Its existence and its progress were conditional upon the recognition of separation from society at large. The Jesuits accepted that their mission in England was to a minority sect by 1625, but the secular clergy accepted missionary status with the regime of Vicars Apostolic in 1685, after a century of internal strife. Among factors contributing to the separative process was the rise of clerical absolutism. Among congregations in the new industrial towns a degree of congregational participation, on the dissenting pattern, manifested itself in lay trusts for financing chapel building, in charitable and educational enterprise, and in vernacular, congregational prayer.

Dr. Bossy has reinterpreted for Roman Catholics a vital part of their heritage, and it is exciting reading. He has also made a major contribution to the history of English non-conformity, set in its whole historical context. The experience of Roman Catholics and Anglicans had their parallels. Both were conditioned by the power of the landowning class, enriched by the Reformation. For both advance was only possible when the attempt to reverse history and recall the medieval church was abandoned.

MARY FINCH LINCOLN

Book Review


The underlying theme of these two books is the same: how could the religious traditions and institutions of pre-Reformation England, part of medieval Christendom, be adapted to the conditions of a secular society drastically transformed and fragmented in the age of the Reformation? Only if continuity with the past could be reconciled with an open and flexible system could there be reform and rebuilding to meet changed needs. In Continuity and Change a group of young Reformation history specialists

GEORGE R. F. BRYANT

10 G. Webster, 'A Roman potter at South Carlton, Lincolnshire', Antiquaries Journal, XXIV, (1944), pp.129-143 (South Carlton); G. Webster, op. cit., note 9 (Swanpool); P. Corder, A Roman-British pottery kiln at Lincoln Racecourse, (University of Nottingham, 1950) (Lincoln Racecourse).

G. Webster, 'A Roman-British pottery kiln at Rookery Lane', Antiquaries Journal, XL, (1960), pp.214-220 (Rookery Lane).


This is a complete list of the reports of long-flued kilns with ash pits located by the author. There may well be others — there are certainly other so far unreported examples at Swanpool and Elsham, South Humberside, for information of which thanks are due to J. B. Whitwell, K. Wood and J. Samuels.


The kilns are numbered 7, 8, and 9 in order to carry on the sequence of Roman-British experimental firings at Barton-on-Humber. For reports of the previous six experimental firings see G. F. Bryant, 'Two Experimental Roman-British kiln firings at Barton-on-Humber, Lincolnshire', Journal of the Socinian Museum Society iii, pt. i (1970), pp.1-16; G. F. Bryant, 'Experimental Roman-British kiln firings at Barton-on-Humber, Lincolnshire', the Workers' Educational Association, Barton-on-Humber Branch, occasional paper no. 1 (1971), pp.1-20; and G. F. Bryant, op. cit., note 11, pp.149-160.

Thanks are due to the late Mr. M. Mackereth and Mrs. P. Chisholme for allowing the use of their property as the site for the experiments; to Mr. E. Coulam for help and advice; to Messrs. R. Cook and S. Ayscough, and the British Steel Corporation, for assistance in arranging the temperature recording; to Messrs. A. Fletcher, N. Land, J. Sparks, and others providing pottery for the experiments; and to David Morris, Leicestershire County Survey of Antiquities, who helped in all the experiments and who has read this paper and made many useful comments.

Kilns 7, 8, and 9 were practically identical in plan and section, except that one kiln, 9, was drawn only partly. Variations in building materials and pedestal arrangements are indicated in the text.


For a discussion of this technique see G. F. Bryant, op. cit., note 11, pp.151-152.

Compare this with the loading of kilns 3 and 4 where the oven walls were much higher and pottery was not stacked above the height of these walls, see G. F. Bryant (1971), op. cit., note 12, Figs. 1a and 2.

This was almost at right angles to the axis of the flue but had no noticeable effect on the kiln at any stage of the firing.

This was without doubt the blackest and most glossy pottery ever produced in the Barton experimental firings. One of the pots showed no signs of leakage after holding water for a week — the same pot, fired to the same temperature but oxidised, would have been very porous.

David Morris, with considerable justification, questions the value of raking out these kilns at all and considers the process a waste of time and fuel. The ash in the flue is disturbed and the kiln temperature reduced. He suggests that the only time that the rake should be used is to keep a pathway clear for air to pass over the ash bed and through new fuel stacked on these ashes.