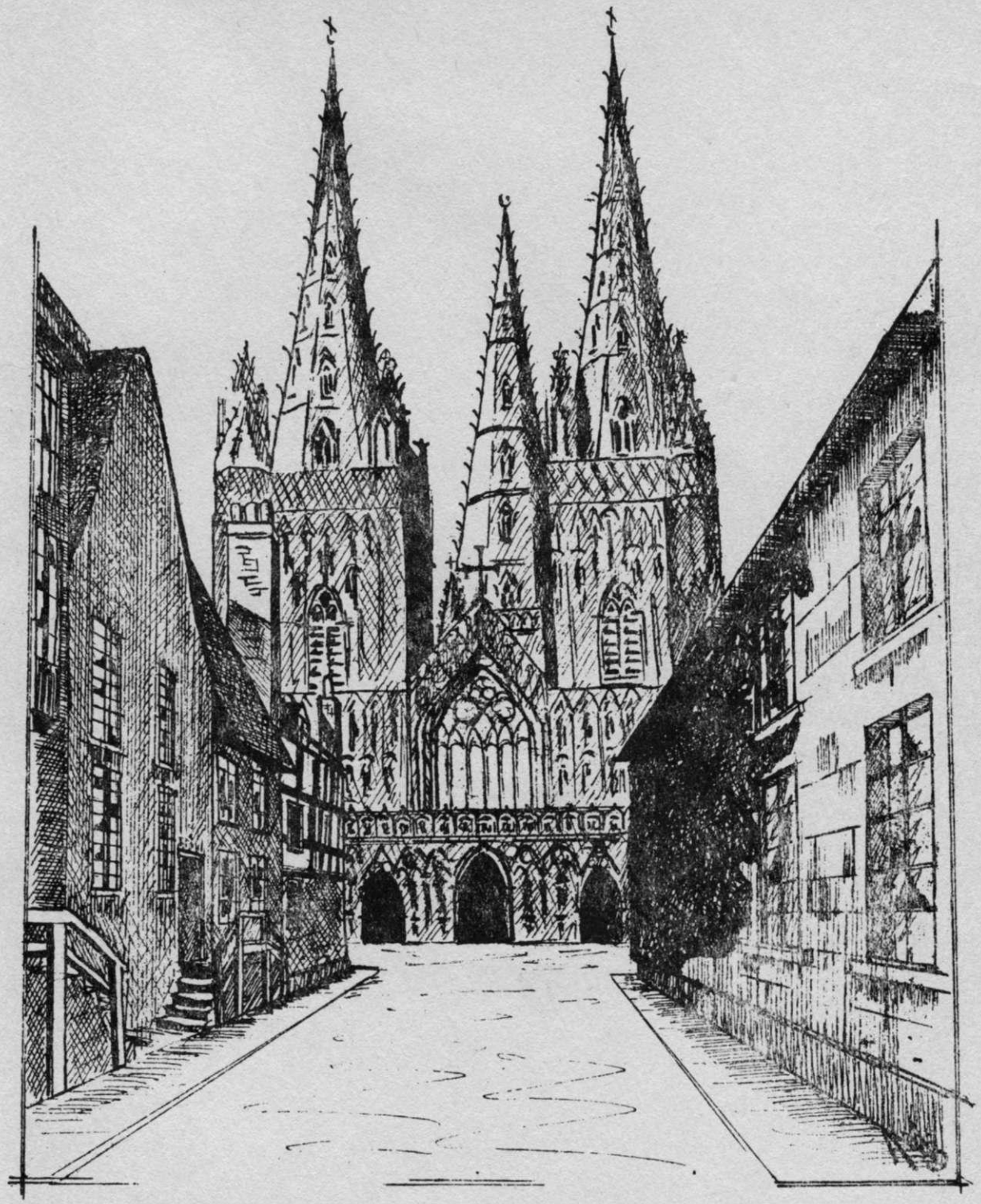

LICHFIELD AND SOUTH STAFFORDSHIRE
ARCHAEOLOGICAL & HISTORICAL SOCIETY

TRANSACTIONS 1964-65 VOLUME VI

LICHFIELD AND SOUTH STAFFORDSHIRE
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For brevity repeated references have been abbreviated as follows, all other references are given in full:

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Camulodunum	C. F. C. Hawkes and M. R. Hull, ***Camulodunum.*** Report of the Research Committee of the Society of Antiquaries of London, No. 14, 1947
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EXCAVATIONS IN ADVANCE OF ROAD CONSTRUCTION AT SHENSTONE AND WALL (Staffordshire)

By J. GOULD, F.S.A.

INTRODUCTION

DURING THE WINTER AND SPRING OF 1963-4, the imminent construction of a by-pass road made excavation near the Ryknield Street - Watling Street cross-roads imperative. The present A5 road follows the line of the Roman Watling Street as it travels west from Atherstone until reaching Shenstone, where the A38 road is encountered. Here the modern A5 road turns northwards, following the A38 for a short distance before turning westwards to the modern village of Wall. The Roman road, however, continued straight to Wall without this curious deviation. The new by-pass is to follow the line of the Roman road, pass under the railway line that links Birmingham with Lichfield, then gradually swing away from the Roman road, passing south of the Ryknield Street - Watling Street junction but rejoining the present A5 road, west of Wall village (fig. 1).

Between the railway line and the Ryknield Street is a peat-bog, now drained, but which may have been the cause of the modern road deviating in the above manner. During the winter and spring, often in adverse weather conditions, a section was cut through the Watling Street, immediately east of the railway line, Nat. Grid SK 109060 (fig. 2, site U), and an area was excavated west of the railway line, Nat. Grid SK 107062 (fig. 2, site V). This was done at week-ends by the Society at the instigation of the Ministry of Public Buildings and Works.

ACKNOWLEDGEMENTS

Thanks are due to many people. Mr. Saxton allowed us to work on land not then taken over by the Ministry; Mr. B. R. Hartley, F.S.A. and Miss F. Pearce commented on all the samian ware found and Mrs. K. F. Hartley did the same on the mortarium stamps. Dr. D. B. Harden, O.B.E., F.S.A. examined the glass fragments and Dr. J. Kent, F.S.A. the coins. Dr. G. Webster, F.S.A. offered help in various directions and is responsible for the drawing of the trumpet brooch (fig. 7). Professor H. Godwin, Sc.D., F.R.S. and J. H. Dickson, B.Sc, Ph.D. cut and examined a monolith of peat from below the Roman Watling Street and Mrs. C. A. Dickson did the pollen analysis; Mr. H. F. Cleere, B.A. examined the iron slag, and Dr. J. G. L. Cole, the bones. Many people worked under very trying conditions especially Messrs. M. Baker, J. Brangan, Dr. J. G. L. Cole, Rev. B. Coley, B. Haywood, F. H. Lyon, A. A. Round, J. W. Whiston, D. Williamson, Misses M. Attwood, G. K. Mills, H. Moore, E. Reed, G. Taylor and Mrs. D. Gould.

The Ministry of Public Works and Buildings has contributed to the cost of publishing this report.

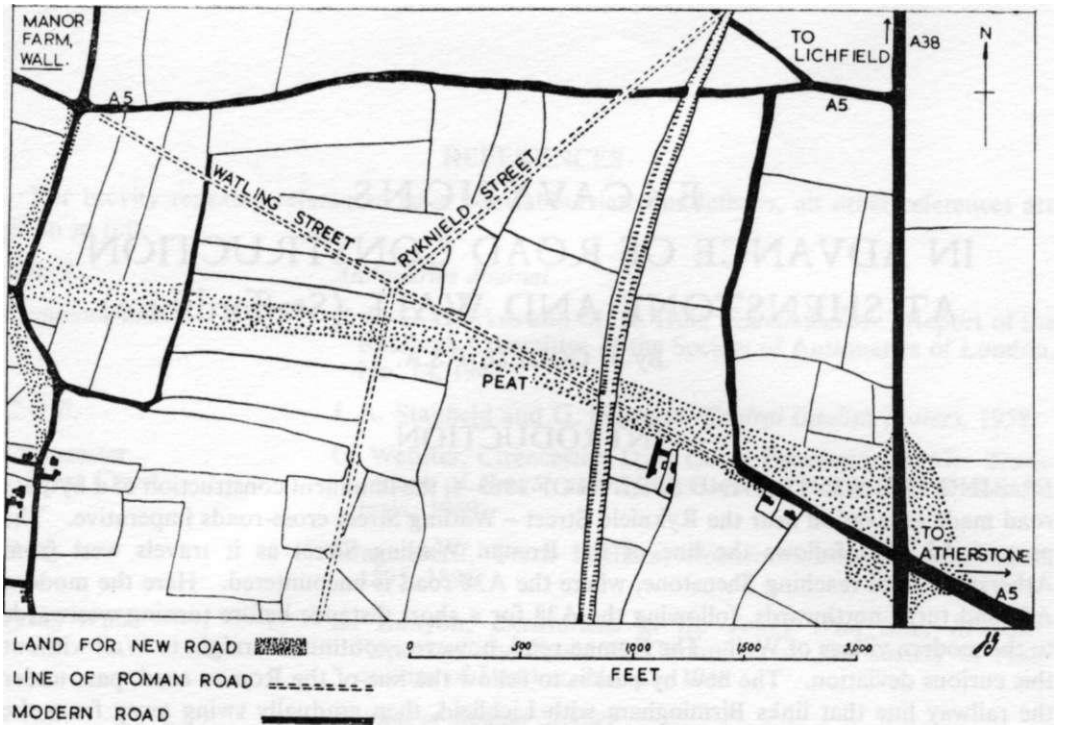

Fig. 1 Map showing line of new road ***(Crown Copyright reserved)***

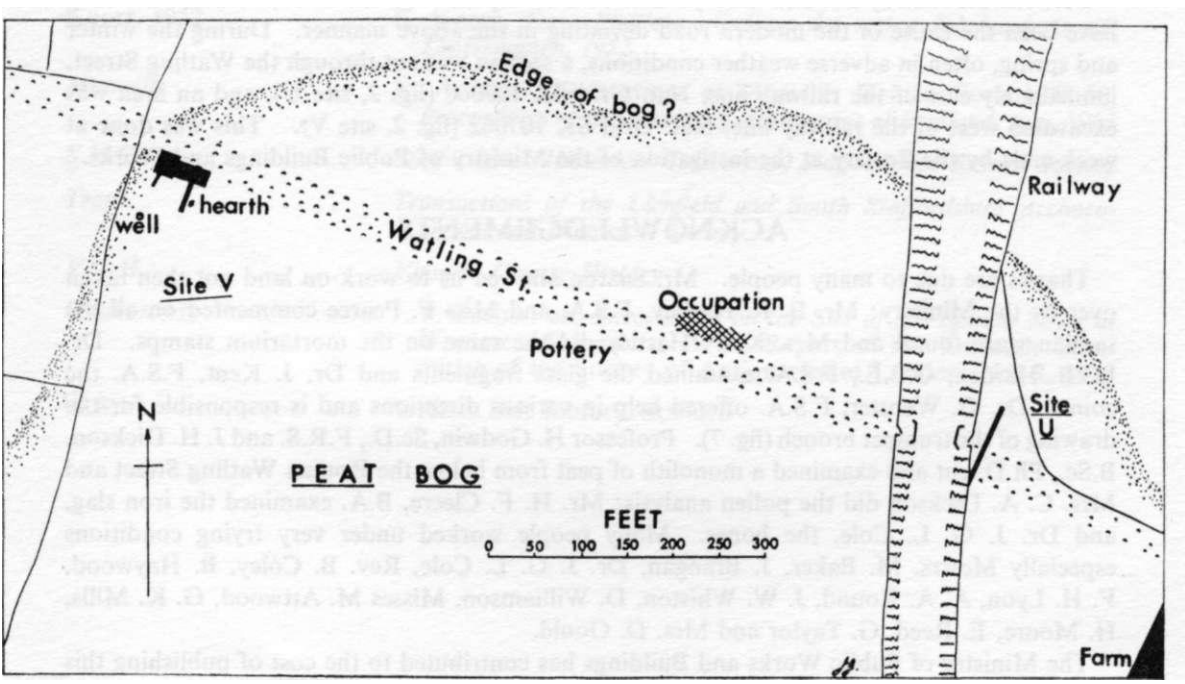

Fig. 2 Plan showing the positions of sites U and V

THE ROMAN WATLING STREET (figs. 1, 2, 3 and 4)

On site U, a 3 ft. trench, 86 ft. long, was cut across the Watling Street and at right angles to it. The road was 27 ft. wide and consisted of sand and gravel laid directly upon peat, which here was 9 in. thick. The ***agger*** of the road had been ploughed out, and immediately to the north of the road, above the peat, was a spread of loose clean sand and gravel, probably representing part of the ***agger*** when it was first ploughed across. This was easily distinguished from the road proper, since there the sand and gravel, 6 in. to 9 in. thick, was very dirty, possibly due to the metalling partly settling into the peat. There was no side-ditch north of the Watling Street. To the south, the peat had been removed leaving a peculiar scoop. It was not possible to extend the trench southwards to examine this.

On siteV, the road could not be sectioned as the full width was not available for excavation. West of the railway, much of the road was removed mechanically, and a watch was kept on this. Everywhere a thin layer in.) of very clean sand was observed between the metalling and the peat. A close watch here, as well as on sites U and V, found no timbers supporting the road, despite a claim by Hodgkinson to have found diagonal logs of Scots Pine under the metalling when he cut a section through the road near here some thirty years earlier[1]. Some logs of Scots Pine were indeed found, but these were below the peat and not above it and were isolated logs not confined to the line of the road. They belonged to the pine woodland that preceded the peat-forming bog.

Prof. H. Godwin and Dr. J. H. Dickson of the School of Botany at Cambridge University cut a pillar of peat from below the undisturbed base of the Roman road, some 125 yards west of the railway line. The results of their microscopic examination and pollen analyses are given at page 17 and confirm that the logs of Scots Pine should be associated with the period when the peat was first forming.

The first metalling of the Watling Street has been dated to ***c.*** A.D. 70[2].

THE BUILDINGS (figs. 2, 4 and 5)

The excavation trench on site U was extended for 54 ft. north of the road, but the only traces of occupation found were a small nondescript grey sherd and a scrap of a clay tobacco-pipe, both resting on top of the peat. There was also a spread of grey clay, 6 in. thick, resting on the peat, 26 ft. north of the road, occupying the width of the trench and extending 8 ft. along it. The top had been scored by the plough and the clay had an uneven edge. There was nothing to show when or why it had been placed there.

On site V was a heavy surface scatter of millstone fragments (see page 15) and Roman pottery. A trench 4 ft. wide, 52 ft. long, was cut at right angles to and on the south side of the Watling Street, but only when within 12 ft. of the road were Roman levels found. South of this, all Roman strata had been ploughed out, 18 in. of plough-soil resting directly on undisturbed peat. The occupation layers near the road had been heavily scored by the plough, but had been saved from complete destruction by the spread of the ***agger.*** Over most of the area the stratification was less than 4 in. thick and this remained true when a large area, 54 ft. by 16 ft. was stripped. Where there were humps in the uneven glacial subsoil, all stratification had been destroyed. Here, to the south of the Watling Street, was a wide shallow 'ditch'

[1] **Unpublished MSS in the possession of J. Gould.** [2] ***Trans,*** **v, 1965, p. 13.**

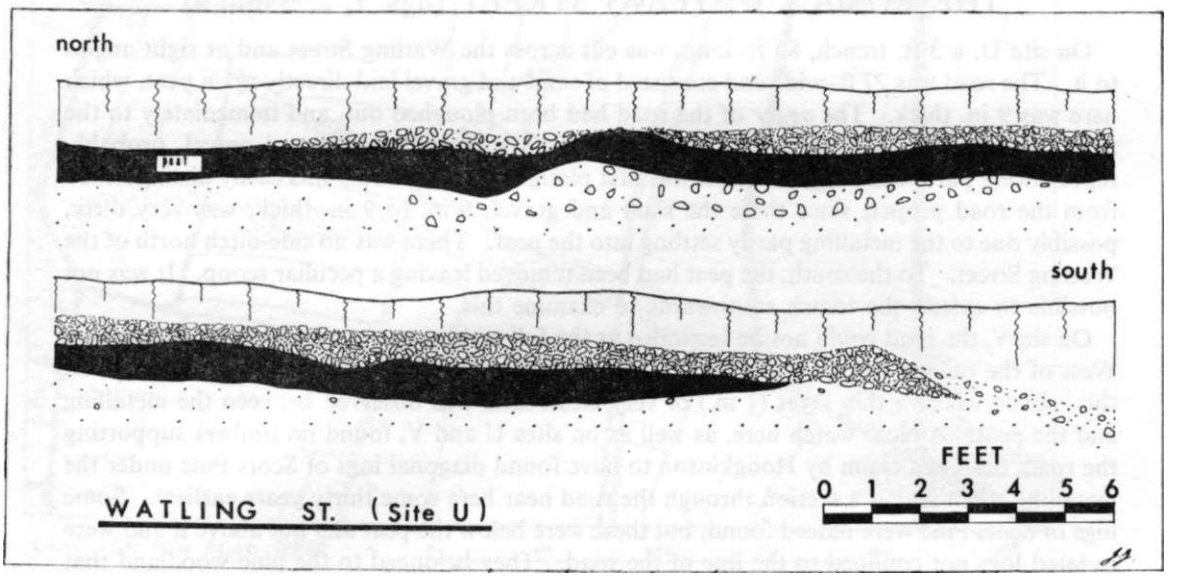

Fig. 3 Section through Watling Street, site U

('scoop' would be a more accurate description) which had been repeatedly recut. At one time the 'ditch' had been 6 ft. wide but had only penetrated the peat, exposing a wide area of subsoil presumably in the hope that water would drain through the sandy gravel. To the east, no cutting had penetrated into this gravel, indeed the 'ditch' there was so shallow that over one hump in the glacial subsoil even the 'ditch' had been ploughed out. To the west, one recutting had been deeper (3 ft. 8 in.). This 'ditch' was later than the near-by Roman buildings, and destroyed the levels which would have related the buildings to the road. Despite the 'ditch' being later than the buildings, it contained no post-Roman material. The last recutting was filled with charcoal and slag with a heavily oxidized ferruginous spread above (fig. 4). With the charcoal were fragments of colour-coated pottery, including a piece from the body of an elongated folded beaker. This all suggested ironworking in the third or fourth centuries, but we were not allowed to extend the excavations to seek details of this. Details of the slags are given at page 18.

The earliest building (I) was rectangular, but only the north-west angle was found. The evidence was the bottom of a construction trench, 18 in. wide, which had been cut through the peat but not into the gravel subsoil. The western side was followed southwards until a point was reached where both trench and peat had been ploughed away. To the east, the construction trench had been cut into by the hearth of the succeeding building. On the stony top of the subsoil revealed by the trench, no stake-holes could be found, and there was no indication of extra support at the corner. The bottom of the trench was flat and could have held a sleeper-beam, but if this was so, it had decayed and the trench, when found, held only a mixture of dirty sand and grey clay. The building was at least 16 ft. by 24 ft. and was not firmly dated. It has been assigned tentatively to the first century as the following building was Trajanic and some first-century sherds were found on the site.

Building II was sub-rectangular, 12 ft. wide at the western end and was at least 20 ft. long. The long side was at an angle to the road. The walls were supported by upright timbers in shallow post-holes which had penetrated only the peat. These insubstantial holes suggest a low wall with horizontal timbers to give rigidity. To the south and west was a double line of stake-holes in the peat between the post-holes, and these, with the surrounding spread of charcoal with some oxidized clay, indicated wattle and daub walls destroyed by fire. Evidence of the north-east corner had been destroyed by both the road 'ditch' and the plough. A shallow scoop down the centre of the hut, filled with charcoal and containing some scraps of calcined bones and a patch of oxidized clay associated with a badly crushed cooking pot (fig. 8, No. 14), point to a long central hearth, in which the position of the fire might be varied (according to the prevailing wind and draught?) for it is difficult to believe that the whole hearth could have been in use at any one time. Nor could a chimney be visualized that could cope with such a hearth. The post-holes at the north end of the west side, the cessation of stake-holes there (with one exception) and the fact that the floor was more compacted in that area, indicate the position of the door. This must have been very low if the above argument for low side-walls holds. The row of stake-holes south of the south wall, suggests the boxing-in of overhanging eaves to provide storage space. The floor was of dirty sand spread over the

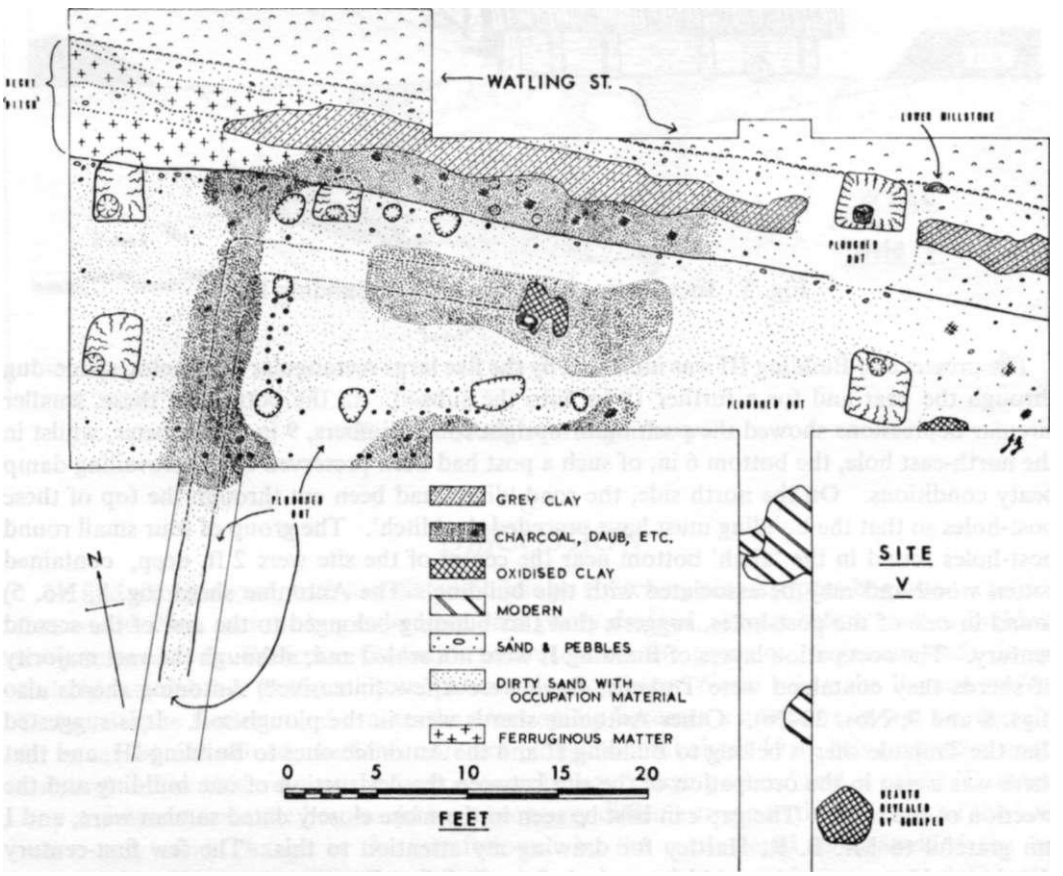

Fig. 4 Plan of site V

peat and was full of broken sherds, as was also the hearth. Some at least of the broken millstones found on the site (see page 15) must be associated with this building, for three fragments were in a post-hole of the following building. The whole suggests very squalid living-quarters occupied during the Trajanic period, eventually destroyed by fire as is not surprising in view of the long hearth. Given a good supply of fuel, skins and rushes to guard against the damp floor, the low doorway and a disregard for fresh air, such a hut could have been warm and comfortable, if somewhat unhealthy.

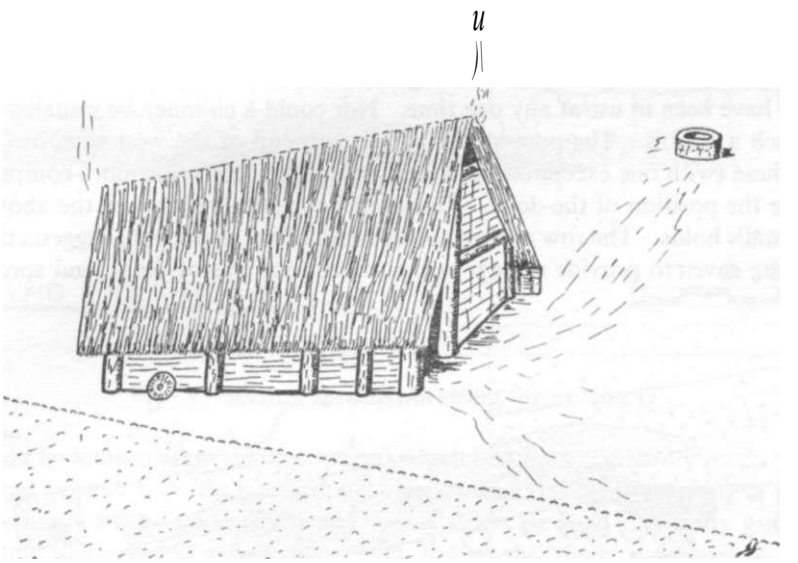

Fig. 5 Imaginative reconstruction of Building II

The presence of Building III was indicated by the five large rectangular post-holes, spade-dug through the peat and for a further 18 in. into the subsoil. In the bottom of these, smaller circular depressions showed the position of upright round timbers, 9 in. in diameter, whilst in the north-east hole, the bottom 6 in. of such a post had been preserved in the prevailing damp peaty conditions. On the north side, the road 'ditch' had been cut through the top of these post-holes so that the building must have preceded the 'ditch'. The group of four small round post-holes found in the 'ditch' bottom near the centre of the site were 2 ft. deep, contained rotten wood and may be associated with this building. The Antonine sherd (fig. 8, No. 5) found in one of the post-holes, suggests that this building belonged to the end of the second century. The occupation layers of Building II were not sealed and, although the vast majority of sherds they contained were Trajanic, there were a few (intrusive?) Antonine sherds also (figs. 8 and 9, Nos. 22-26). Other Antonine sherds were in the plough-soil. It is suggested that the Trajanic sherds belong to Building II and the Antonine ones to Building III, and that there was a gap in the occupation of the site between the destruction of one building and the erection of the other. The gap can best be seen in the more closely dated samian ware, and I am grateful to Mr. B. R. Hartley for drawing my attention to this. The few first-century sherds would appear to be rubbish survivals from Building I.

THE WELL (figs. 2 and 6)

While excavation was proceeding, the owner of the land reclaimed peat mechanically from the line of the by-pass, the reclamation work coming right up to the excavations (site V) and removing most of the trench that had been first opened. South of the buildings the mechanical scraper uncovered a small well, 2 ft. in diameter and only 6 ft. deep. It was built of local sandstone and had a backing of clay 2 ft. thick. It is suggested that this was to prevent water entering the well direct from the peat-bog, ensuring that all water was filtered by the sandy subsoil. If this was so, the end was partly defeated by bad workmanship which allowed a patch of peat to slip into the wide construction trench (fig. 6). The pottery from the well bottom shows that the well was built for Building III, or else was cleaned out when that building was erected.

Apart from the well, the mechanical scraper also revealed the bottom of a hearth and occupation at the points shown on fig. 4, although it was not possible to secure fuller details.

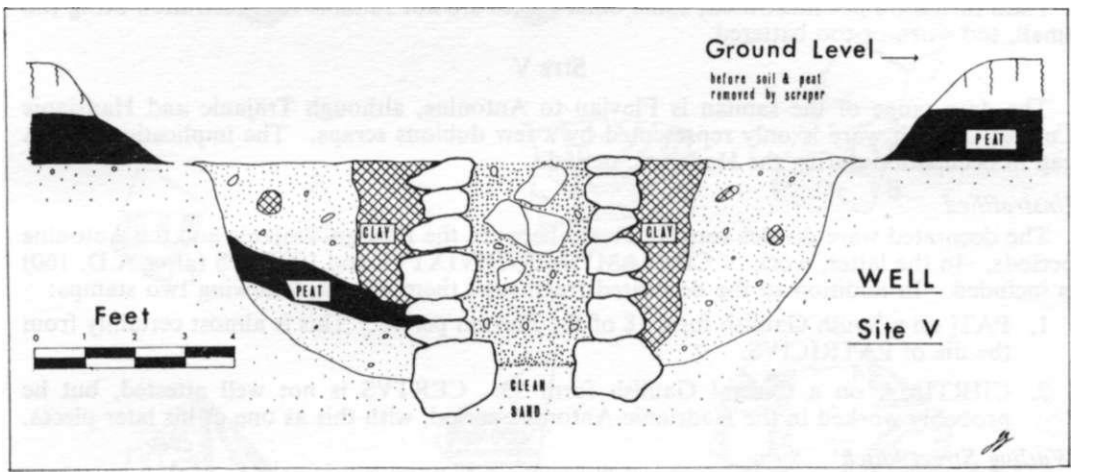

Fig. 6 Section through the well

DISCUSSION

To find a major road, with associated buildings, stretching across a peat-bog was surprising. One would think that the bog must have been partly drained, at least before road or buildings were constructed. Professor Godwin's comments on the presence of ***Juncus*** seeds do not entirely rule this out as the microscopic examination began 6 cm. below the Roman surface. Today, despite modern land-drains, the area rapidly becomes a quagmire in wet weather. As far as can be ascertained, the fields were not ploughed until about 1930, being regarded as too wet, and on the tithe returns the land is described as 'rough pasture' and is called 'Oxmoor'. Any attempt to drain the bog would have been very difficult owing to the contours of the land, and a very small change in the line followed by the road would have avoided the bog completely. Hence it is difficult to believe that such an attempt at drainage was deliberately

made by the Romans for the sake of the road. On the other hand, if the Crane and Bourne Brooks which run through Shenstone had managed to cut a more satisfactory escape through the surrounding hills, a small fall in water level might have resulted, with some drying out of the bog, especially near the edges. Such would also help to explain the position of the Roman farm-stead at Shenstone[3]. The geology of the district and the bad drainage have been recently discussed by Mr. R. E. Hebden[4]. Whatever may have been the case, the method of construction of both buildings and road was unsatisfactory. Whilst the spreading of sand on the peat may have consolidated the surface before building up the ***agger,*** such a road could not have carried heavy weights and it is not surprising that this section went out of use.

THE SAMIAN WARE (fig. 7)

B. R. HARTLEY, F.S.A. and FELICITY PEARCE

Plain forms are not illustrated; some other pieces are not suitable for illustration being too small, too worn or too battered.

SITE V

The date range of the samian is Flavian to Antonine, although Trajanic and Hadrianic Central Gaulish ware is only represented by a few dubious scraps. The implication is of a gap in occupation during the Hadrianic period.

Unstratified

The decorated ware divides roughly evenly between the Flavian-Trajanic and the Antonine periods. In the latter, work of CINNAMVS (?), DIVIXTVS and CETTVS (after A.D. 160) is included. In addition to the decorated fragments, there are the following two stamps:

1. PAT[on a South Gaulish form 18 of the Flavian period. This is almost certainly from the die of PATRICIVS.
2. CIIRTIMA on a Central Gaulish form 33. CERTVS is not well attested, but he probably worked in the Hadrianic-Antonine period, with this as one of his later pieces.

Watling Street 'ditch'

3. Form 37, Central Gaulish, probably the ALBVCIVS/PATERNVS ovolo, Antonine.

Watling Street 'ditch' associated with charcoal and slag

Here were first-century South Gaulish forms 18, 18R, 27, and 37 base with Central Gaulish Antonine forms 31, 33 and 36 and the following:

4. Form 32, East Gaulish, late Antonine,
5. Form 33, Central or East Gaulish, Antonine.

Occupation layers outside the buildings

Here were a number of pieces, mainly South Gaulish ware of the Flavian-Trajanic period, including forms 18, 18/31, 27, 30, 35, 37 and Knorr 78, but there were Antonine Central Gaulish forms 31 and 33 together with the following:

6. Form 27, stamp OF.PRjIMI, certainly earlier than A.D. 80 since stamps of the South Gaulish PRIMVS do not occur on Agricolan sites, though they are common on sites in Britain first occupied under Cerialis.

[3] ***Transactions, Birmingham Archaeological Soc,*** **lxiii, 1944, p. 2.**

[4] ***Trans,*** **iii, 1962, p. 27.**

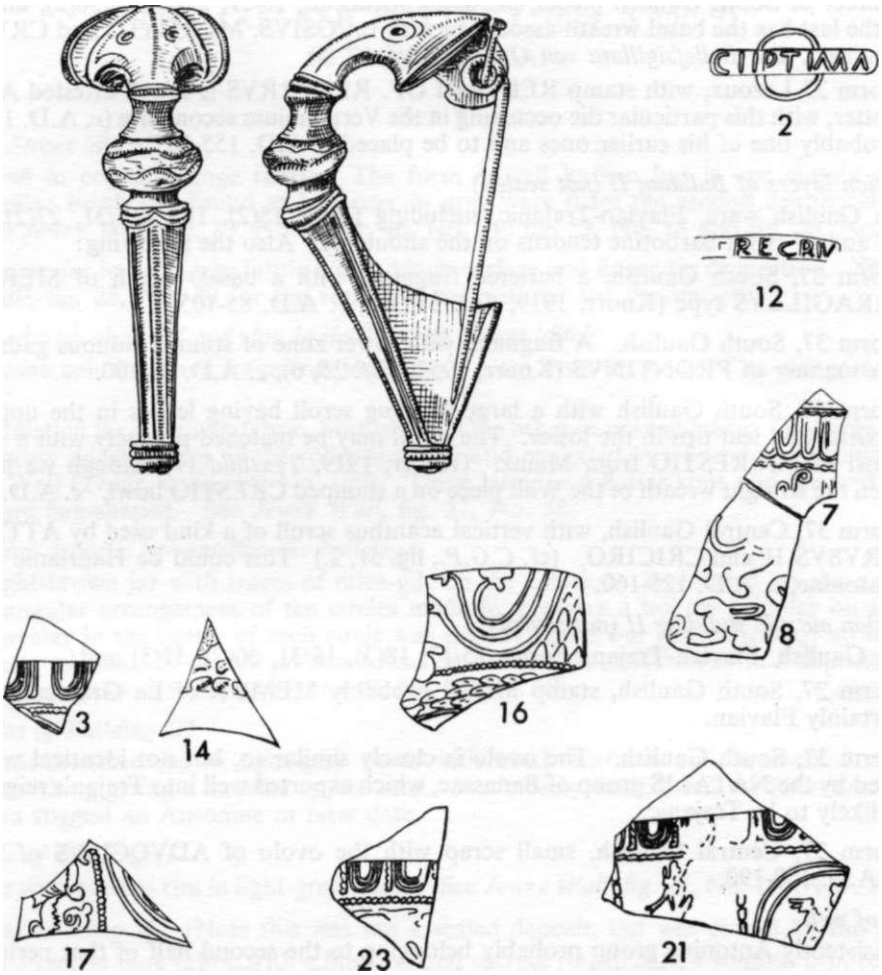

Fig. 7 Decorated samian ware (i), potters' stamps (1/1), and trumpet brooch (1/1)

7 and 8. Form 37. Two joining fragments of a burnt bowl by CETTVS (cf. ***C.G.P.*** pi. 141-4) ***c.*** A.D. 160-190. The figure types are D950a (hare) and D736 (lion reduced?).

The post-holes of Building III

9. Form 30 or 37 rim, burnt. Probably South Gaulish and Flavian-Trajanic.

10. Form 30 or 37 (plain band), South Gaulish, Flavian-Trajanic.

11. Form 38, Central Gaulish, Antonine, burnt.

The post-holes of Building II

12. Form 18, South Gaulish, with stamp P]EREGRIV, usually taken to belong to PEREGRIVS rather than PEREGR1NVS. Stamps from Ilkley and Camelon suggest activity after A.D. 80 and ***c.*** A.D. 75-100 probably covers his range.

Hearth of Building II (not sealed)

A number of South Gaulish pieces, including forms 18, 18/31, 27(2), 35/36(2), and 37(7). One of the last has the basal wreath associated with L.COSIVS, MERCATO and CRVCVRO (cf. Karnitsch, ***Die Relief sigillata von Ovilava, Taf.*** 17, 4).

13. Form 33 Lezoux, with stamp REBVRRI OF. REBVRRVS is a well-attested Antonine potter, with this particular die occurring in the Verulamium second fire ***(c.*** A.D. 150-160), probably one of his earlier ones and to be placed ***c.*** A.D. 155-165.

Occupation layers of Building II (not sealed)

South Gaulish ware, Flavian-Trajanic, including forms 18(2), 18R, 18/31, 27(2), 30, 37 (2 rims) and 67 (with barbotine tendrils on the shoulder). Also the following:

14. Form 37, South Gaulish, a battered fragment with a basal wreath of MERCATO-BIRAGILLVS type (Knorr, 1919, ***Taf.*** 57, 12), ***c.*** A.D. 85-105.

15. Form 37, South Gaulish. A fragment with lower zone of stumpy sinuous gadroons in the manner of FRONTINVS (Knorr, 1952, ***Taf.*** 25, 6), ***c.*** A.D. 80-100.

16. Form 37, South Gaulish with a large winding scroll having leaves in the upper concavities and leaf tips in the lower. The scroll may be matched precisely with a stamped bowl of M.CRESTIO from Mainz. (Knorr, 1919, ***Textbild*** 17), though we have not seen the straight wreath of the Wall piece on a stamped CRESTIO bowl. ***c.*** A.D. 80-100.

17. Form 37, Central Gaulish, with vertical acanthus scroll of a kind used by ATTIANVS, DRVSVS II and CRICIRO. (cf. ***C.G.P.,*** fig. 51, 2.) This could be Hadrianic or early Antonine, ***c.*** A.D. 125-160.

Destruction outside Building II (not sealed)

South Gaulish, Flavian-Trajanic forms 15/17, 18(3), 18/31, 30(?), 37(3) and:

18. Form 27, South Gaulish, stamp MUM, probably MEMOR of La Graufesenque and certainly Flavian.

19. Form 37, South Gaulish. The ovolo is closely similar to, but not identical with, one used by the NATALIS group of Banassac, which exported well into Trajan's reign. This is likely to be Trajanic.

20. Form 37, Central Gaulish, small scrap with the ovolo of ADVOCISVS of Lezoux, ***c.*** A.D. 160-190.

Bottom of well

A consistently Antonine group probably belonging to the second half of that period. All the fragments are Central Gaulish and include forms 31(2), 31(R), 37(rim), and 38 with:

21. Form 37, Central Gaulish in the style of IVLLINVS of Lezoux. The identification rests on the large rhomb-like beads. One figure type cannot be identified, the other is Cupid (d. 264), ***c.*** A.D. 160-190.

Well-filling

22. Form 18R, South Gaulish, Flavian-Trajanic.

From the plough-soil adjacent to the Ryknield Street

Central and East Gaulish pieces of the Antonine period including form 31(2), South Gaulish form 30 or 37(rim) and:

23. Form 37, Central Gaulish, in the style of IVLLINVS ***c.*** A.D. 160-190.

THE COARSE POTTERY (figs. 8 and 9)

J. GOULD, F.S.A.

SITE V

Watling Street 'ditch'

1. Bowl in coarse orange fabric. The form is well known but is not closely datable. Similar bowls are found at Leicester in grey ware from the second century onwards. See ***Jewry Wall,*** fig. 23, No. 4; fig. 46, No. 21; fig. 52, No. 18 and fig. 56, No. 9.
2. Coarse jar in dark-grey fabric with a black surface and finger-tip decoration. See ***Jewry Wall,*** fig. 25, No. 20 for the rim-form but without the decoration.

Associated with charcoal and slag in the Watling Street 'ditch'

Here were colour-coated fragments including a piece from the body of an elongated folded beaker.

3. Rouletted jar in brown fabric, burnished. One other in orange fabric. Possibly a third-century development of the roller-stamped and rouletted jars found in Antonine levels at Wall ***(Trans,*** v, fig. 16, No. 180). These latter had flatter rims and the bodies were more bag-shaped. See ***Jewry Wall,*** fig. 27, No. 38.

Occupation deposits surrounding the buildings

4. Light-brown jar with traces of mica-gilt on the exterior. Decorated on shoulder by a triangular arrangement of ten circles made by pressing a hollow cylinder on the clay. The clay in the centre of each circle was slightly raised but not sufficiently so to justify the term boss. A similar jar was found by Bushe-Fox at Wroxeter in a deposit that he dated to A.D. 80-120, ***(Wroxeter II,*** fig. 19, No. 59).

Post-holes of Building III

5. Wide-mouthed jar in light-grey paste with black surfaces and horizontal bands of burnishing giving a metallic appearance. Not closely datable but the form and decoration suggest an Antonine or later date.

Post-hole of Building II

6. Jar with everted rim in light-grey fabric. See ***Jewry Wall,*** fig. 27, No. 14, (A.D. 100-160).

Hearth of Building II. (Note this was not a sealed deposit, but was scored by the plough.)

7. Small jar in pink fabric with a burnt glazed surface resulting in a smooth bronzed effect. Groups of six diagonal grooves on the shoulder.
8. Piece of a similar, though not identical jar.
9. Small rusticated jar in light-grey paste.
10. Rusticated jar in a badly-fired grey paste.
11. Medium-grey jar with rusticated decoration in strips.
12. Bowl copying shape of Drag. 37 in medium-grey fabric and decorated with inscribed concentric circles.
13. Peculiar inbent rim in brown fabric with a black surface. The sudden narrowing of the thickness of the wall may possibly represent a very deep, squarely-cut groove.
14. Cooking pot in gritty brown fabric, blackened on the outside. The pot was found, surrounded by oxidized clay, within the hearth where cooking may have been taking place when the building was destroyed. The lower part of the pot was severely crushed making an accurate reconstruction of the whole pot impossible.

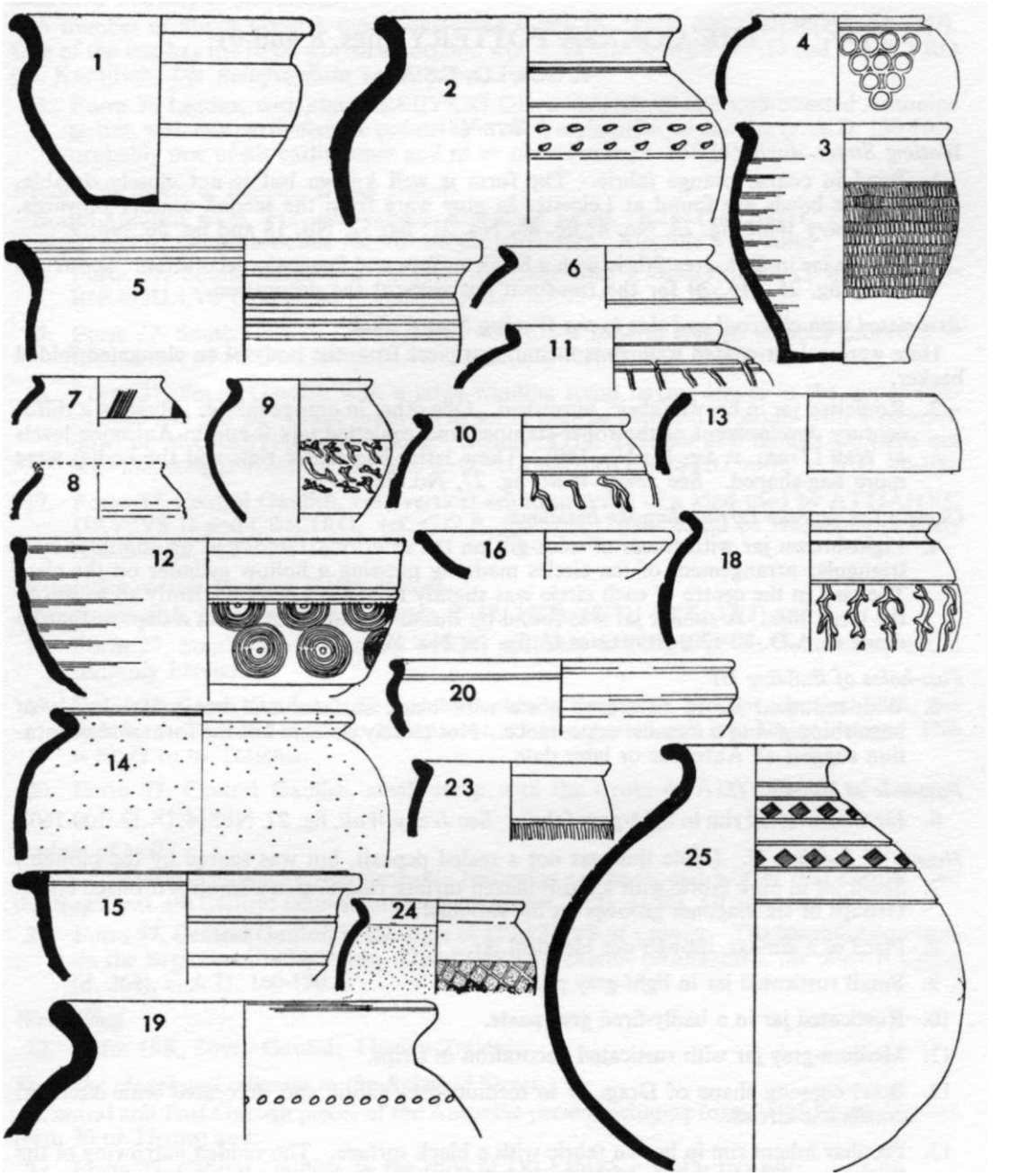

Fig. 8 Coarse pottery *(1)*

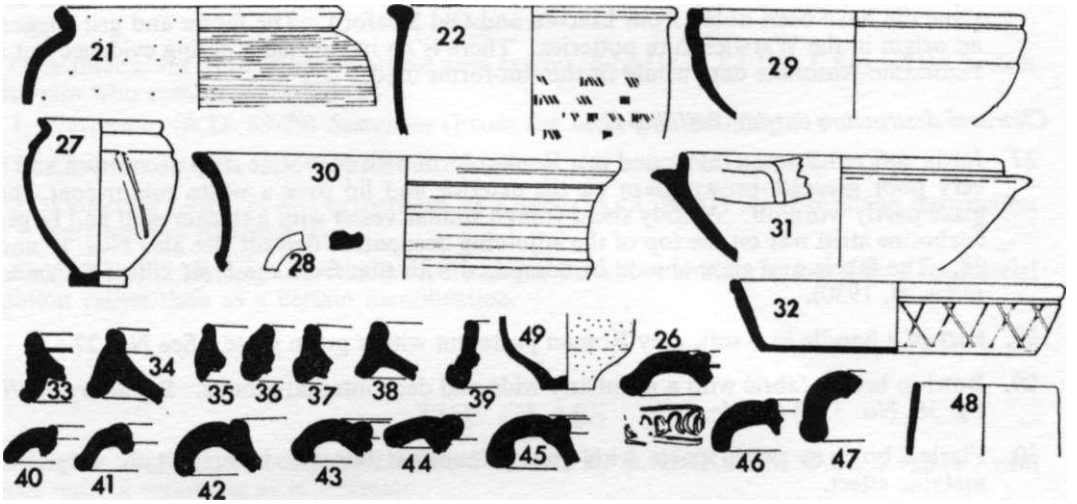

Fig. 9 Coarse pottery ({)

15. Reeded rim bowl with two body grooves in a grey fabric with a black surface. See ***Jewry Wall,*** fig. 38, No. 9. Trajanic.

16. Dish in light-brown fabric, also two similar ones in grey fabric. See ***Jewry Wall,*** fig. 38, No. 2. Trajanic.

17. Small, glazed base from a jar similar to No. 27, (not illustrated).

Occupation layers surrounding the hearth

These layers were not sealed and were scored by the plough. It is suggested that the Trajanic sherds relate to Building II and that the fewer later sherds are intrusive and should be related to Building III.

18. Rusticated jar in gritty, brown fabric.

19. Thick storage jar, finger-tip decoration, grey fabric. See ***Jewry Wall,*** fig. 29, No. 11.

20. Bowl in light-grey fabric and black surface. See Cirencester, Dyer Court, fig. 14, No. 3.

21. Cooking pot, light rilled horizontally in gritty pink fabric. See ***Jewry Wall,*** fig. 39, No. 9. Trajanic.

22. Roller-stamped jar in light-brown fabric with the pattern worn. See ***Trans,*** v, 1965, fig. 16, Nos. 178, 181, etc. and the discussion there.

23. Rouletted jar in brown fabric.

24. Small black-burnished cooking pot in a typical second-century form.

25. Narrow-necked jar in a well-fired, medium-grey fabric. See ***Jewry Wall,*** fig. 25, No. 24.

26. Mortarium rim with stamp. Mrs. K. F. Hartley comments: This stamp could perhaps be read BRACO or DRACO but it is more likely to be the work of an illiterate potter especially in view of the curious device preceding the letters. Other stamps from the same die have been noted from Lincoln and Old Sleaford. The fabric and grit suggest an origin in the Warwickshire potteries. There is no independent dating evidence but a Hadrianic-Antonine date would fit the rim-forms used.

Charcoal destruction outside Building II

27. Jar in soft red Roman fabric and in a Roman form with barbotine strip decoration and a very poor greenish-brown glaze on the exterior and lip over a white colour-coat, the glaze partly worn off. A body sherd from a similar vessel with a thicker wall and larger barbotine strip was on the top of the adjoining occupation deposit, see also Nos. 17 and 28. The fabric and glaze should be compared with that from the Holt kilns ***(Y Cymmrodor,*** xl, 1930).

28. Part of a handle in a soft, grey Roman paste but with a green glaze. See No. 27.

29. Bowl in brown fabric with a peculiarly wide and deep internal groove. See ***Jewry Wall,*** fig. 38, No. 3. Trajanic.

30. Flaring bowl in cream paste with grey colour-coat burnished horizontally to give a metallic effect.

Clean sand at the bottom of the well

31. Flanged bowl in very light-grey fabric and black surface. See ***Jewry Wall,*** fig. 22, No. 16; second and third century.

32. Dish in gritty, cream fabric with smooth brown-burnished surface. The colour of the surface and fabric suggest the sherds had been burnt but, if so, the resulting effect is remarkably even. See Mumrills, fig. 12, No. 26.

Unstratified

33 to 47. Examples of mortarium rims from the plough-soil:

No. 47 bears two worn stamps and Mrs. K. F. Hartley comments:
The two adjacent retrograde stamps, both incompletely impressed are from the single die used by ERVCANVS. Other stamps of his have been noted from Bainbridge, Kirkby Thore, Leicester (5), Melandra Castle, Ribchester(2), Templeborough, Wilderspool (2) and Wroxeter. The fabric is consistent with Midland origin, probably from such source as Hartshill where the rim profiles can be closely paralled. The distribution in the Pennine forts and the Midlands can be matched with that of several Midland potters working before A.D. 140. The Bainbridge stamp is from a securely-dated Flavian-Trajanic deposit, and the relevant deposit at Wroxeter was dated A.D. 90-120 by Bushe-Fox. All existing evidence for the Midland potteries suggests that production began in the earliest years of the second century. A primarily Trajanic date for Erucanus would fit all the factors very well.

48. Rim of a buff beaker with a black colour-coat.

49. Base of a rough-cast beaker in greyish-buff fabric with a black colour-coat.

THE COINS

SITE V

Only three coins were found and these were examined by Dr. J. KENT, F.S.A. of the British Museum who comments as follows:

1. Vespasian (A.D. 69-79) ***Sestertius*** (From the hearth of Building II).
2. Claudius I (A.D. 41-54) Imitation ***As*** (From the hearth of Building 11).
3. Domitian (A.D. 81-96) or perhaps as Caesar (A.D. 70-81) ***As*** (From the destruction surrounding Building II).

Coins 2 and 3 are very corroded and, for these, the above should be taken as a considered opinion rather than as a certain identification.

THE GLASS

All glass fragments have been examined by Dr. D. B. HARDEN, O.B.E., F.S.A., who picks out the following as of interest:

1. Six fragments, including two joining rim fragments, of a bowl, greenish glass with one horizontal wheel incised line just below the rim and two horizontal wheel cuts further down. The shape is a common one, and the outbent rim is very typical of Roman glasses in the third and fourth century though it does occur earlier too. It may even be of the late first century, for there were examples of this kind of thing at ***Camulodunum,*** pi. 88, Nos. 72 and 73). The outbent rim of this bowl looks more fourth century than first century. (Three of the fragments came from the plough-soil and three from the occupation deposits within Building II, though these latter were not sealed and had been scored by the plough).
2. A large base fragment from a prismatic jug. This is a finely made specimen, well moulded with three concentric circles on the base and must be a first-century example. (From the edge of the hearth of Building II).
3. Fragment from the base of a similar (but not the same) jug also with concentric circles on the base. (From the edge of the hearth of Building II).
4. Fragment from the bottom of a pillar-moulded bowl showing radial ribbing. (From the destruction outside Building II).
5. Fragment from the ribbed handle of a jug . (From the destruction outside Building II).

THE MILLSTONES

J. GOULD, F.S.A.

SITE V

A feature of the excavation was the extraordinary number of millstone fragments, nearly all of them being in the plough-soil. One lower stone (from the Watling Street 'ditch') was complete, another piece represents half a lower stone, but the remaining 102 pieces were much smaller. From these, the fragments definitely from either an upper stone or a lower stone were separated. These in turn were sorted according to the characteristics (colour, size of grit, etc.) of the stone from which they were made, and in the case of fragments showing part of the

rounded edge of the stone, according to wide differences in thickness. As a result it was determined that there were pieces from at least fourteen lower and seventeen upper stones. The complete stone was 14 in. diameter and there appears to have been very little variation in diameter between the others. One stone was made of lava, one of a sandstone conglomerate, but all the others were of millstone grit. Three of the smaller fragments had been squared and one showed signs of having been used as some sort of rubber after squaring. Six pieces had traces of iron adhering to them when found. Consequently, there is a slight possibility that the millstones are the remains of old or broken stones brought to the site for some secondary industrial purpose. Against this is the many mortarium fragments found in the plough-soil, though the number of these was much less extraordinary than the number of millstones.

BRONZE ARTICLES

J. GOULD, F.S.A.

1. A trumpet brooch (fig. 7) in tinned bronze with elaborate decoration and a dark-blue glass bead inserted into the foot. This brooch should be compared with that brooch with silver inlay found in Chester in 1961 ***(Ant. J.,*** xliii, 1963, p. 289).
2. A bronze trumpet brooch, much corroded (not illustrated).
3. A bronze dolphin brooch, also much corroded (not illustrated).

THE BONES

Dr. J. G. L. COLE, M.R.C.S., L.R.C.P., M.B., Ch.B.

In the prevailing peaty conditions, most fragments of bone had been reduced to a brown sticky smudge, though some calcined fragments had survived from the hearth of Building II. As might be expected, the molar teeth of ox had survived best, several examples of which were found including two side by side in anatomical position. There were also smalffragments of ribs of large and small animals, not large enough for positive identification. The most interesting bone was a complete left talus (astragulus) of a small pig. All were considerably calcined.

REPORT ON PLANT REMAINS IN ORGANIC DEPOSITS BELOW ROMAN ROAD (WATLING STREET) AT WALL, MONOLITH CUT AND EXAMINED

by

PROFESSOR H. GODWIN, Sc.D., F.R.S. and **J. H.** DICKSON, **B**.Sc, Ph.D.

The monolith passes through buff clayey sand at the top to about 40 cm. of dark-brown crumbly amorphous organic mud which contained recent rootlets throughout. There is a basal transition to buff clayey sand. The organic mud was measured downwards in centimetres. Microscopic remains were examined from the following levels:

6 cm. Silty, sandy, detritus mud with charcoal fragments (too small to identify). Seeds of ***Juncus acutiflorus*** or /. ***articulatus.***

16 cm. Silty, sandy, detritus mud. Seeds of /. ***acutiflorus*** or /. ***articulatus*** and ***J. bulbosus.***

26 cm. Silty detritus mud with carbonized fragments. Rare ***Sphagnum*** leaves and seeds of ***J. acutiflorus*** or ***J. articulatus.***

38 cm. Silty, very sandy, detritus mud.

POLLEN ANALYSIS - from samples taken near the top and bottom of the organic mud - by Mrs. C. A. Dickson.

	6 cm.	38 cm.
Betula	2-0	1-3
Pinus	0-6	96-0
Ulmus	12-0	0-6
Quercus	0-6	1-3
AInus	84-0	0-6
Corylus	5-0	16-0
Salix	0-6	
Hedera	0 6	
Gramineae	10-0	3-0
Cyperaceae	14-0	
Calluna vulgaris	2-6	
Compositae (Tubuliflorae)	-	0-6
Compositae (Liguliflorae)	2-0	
Caryophyllaceae	1-3	
Plantago lanceolata	1-3	
Potentilla	-	0-6
Ranunculaceae	0-6	
Rubiaceae	0-6	
Rumex sp.	0-6	
Umbelliferae	0-6	
Sparganium	0-6	-
Ophioglossum	+	1-3
Polypodium vulgare	1-3	
Pteridium aquilinum	3-0	1-3
Filicales	54-0	16-0
Sphagnum		8-0

All pollen expressed as a percentage of the total (150) tree pollen counted.

COMMENT

The plant identifications permit only meagre conclusions. Field observation showed pine stumps rooted in the underlying sandy soil and this explains the very high frequency of pine pollen in the lowest sample of the organic mud; the presence of ***Sphagnum*** spores indicates locally acidic conditions.

The prevalence of ***Juncus*** seeds in the silty organic muds indicates the marshy conditions that followed the inundation of the pine woodland, and were maintained throughout accumulation of the 'peat'; at the level of the uppermost pollen sample there were probably local growths of alder. The age of the organic muds is not clearly indicated, except that they are post-boreal and that the uppermost sample gives some indication of woodland clearance in the presence of pollen of the ribwort plantain. The high frequency of elm tree pollen in this later stage, especially in view of the high local frequency of alder and the low values for oak, is remarkable.

H. GODWIN

University Sub-department of Quaternary Research,
Botany School,
Cambridge.
July 1964.

REPORT ON THE SLAGS FROM THE WATLING STREET 'DITCH'

H. F. **CLEERE**, B.A.

Slag specimens were submitted via Mr. M. M. Hallett. These fall into three groups:

1. ***Furnace-lining material***

   This is a sandy clay which has been raised to a high temperature and is in consequence red in colour on one surface. The other surface is dark grey and is vesicular. The section shows a gradation from the dark-grey inner surface to the red clay. The material is an example of furnace lining, consisting of clay that has dried out during the smelting process. The small interstices, resulting from fairly rapid drying, have been filled in with molten slag.

2. ***Dense Slag***

   This is a dark-grey material of high specific gravity, which consists of fayalite, a mixture of silica (SiO_2) and iron oxide (Fe_2O_3). It represents the gangue material from the iron ore, which has been fluxed off using reoxidized metallic iron reduced from the ore. The iron (Fe) content is probably of the order of 50-60%.

3. ***Light Slag***

   This is an interesting light-grey material with a fairly low specific gravity. It is very vesicular, and its iron (Fe) content is probably not more than about 20%.

COMMENTS ON THE MATERIALS

The furnace-lining material is common from iron-making sites. There is no direct evidence to suggest that this material came from a smelting furnace, since a great deal of slag is likely to have been present in smithing hearths used for reheating rough blooms for further processing.

The dense slag is equally familiar from other Romano-British sites. It has generally been accepted that lime or limestone was not used as a flux in this period, the silica gangue material of the ore being taken off in a molten form by combination with reoxidized iron oxide, also from the ore, in the form of Fe_2O_3. This produced a molten slag at about 1100°C. Most slags of this kind that have been analysed have shown an iron (Fe) content of 50-60 %, which means that the process was wasteful, in that more than half the iron in the ore was used to take away the gangue material.

The light slag was most unusual, though similar material has been reported from one or two other Roman sites. Although there is no strong evidence that lime was used as a flux in Romano-British iron-making, the light colour of the present sample, together with the presence of some pieces of shell, suggested that lime might have been deliberately added. The shell particles were too small to permit positive identification but were almost certainly a variety of edible oyster; their presence was thus probably coincidental. To settle the question, a complete analysis of mixed selected lumps of the slag was kindly performed by the British Cast Iron Research Association with the following results:

	%
Silica (SiO_2)	59-7
Lime (CaO)	3-0
Alumina (Al_2O_3)	9-6
Magnesia (MgO)	2-3
Ferrous Oxide (FeO)	11-8
Manganese oxide (MnO)	0-31
Titanium oxide (TiO_2)	0-59
Phosphorus pentoxide (P_2O_5)	3-0
Sodium oxide (Na_2O)	0-43
Potassium oxide (K_2O)	1-91
Carbon dioxide (CO_2)	4-2

The remainder may be hydroxyl.

The slag may have been contaminated with silicious matter, such as refractories or local pebbles on to which it had run. The light colour is simply due to the low iron content. There has not been any large addition of lime.

The material submitted is valid evidence for iron-smelting in the area of the site. The furnace-lining material and more particularly the dense slag are typical of bloomery sites of the Roman period in the Weald, the Forest of Dean and elsewhere.

THE OLD HORNS INN, QUESLETT,

STAFFORDSHIRE

Queslett used to be a remote hamlet of a few houses, an inn, and a blacksmith's forge. Before the second world war, a housing estate was started in the area, this estate grew and overtook the original hamlet of Queslett, so that by 1964 only the inn remained.

The inn, The Old Horns (National Grid SP 063951), has now been replaced by a modern building on an adjacent site. Demolition of the old building took place in August 1964 and the Society was invited by the Aldridge U.D.C. to observe the building as it was being taken down; this was undertaken by Mr. V. F. Penn. It was found that the structure of the building was not very old and no features of interest were revealed during demolition.

Incorporated in the building was a plaque of the Scott crest ***(a beacon sable, fired proper, ladder gules)*** a feature which is found on a few other buildings on the Scott estate in the district.

Reference: ***Walsall Observer,*** **7 Sept. 1964.**

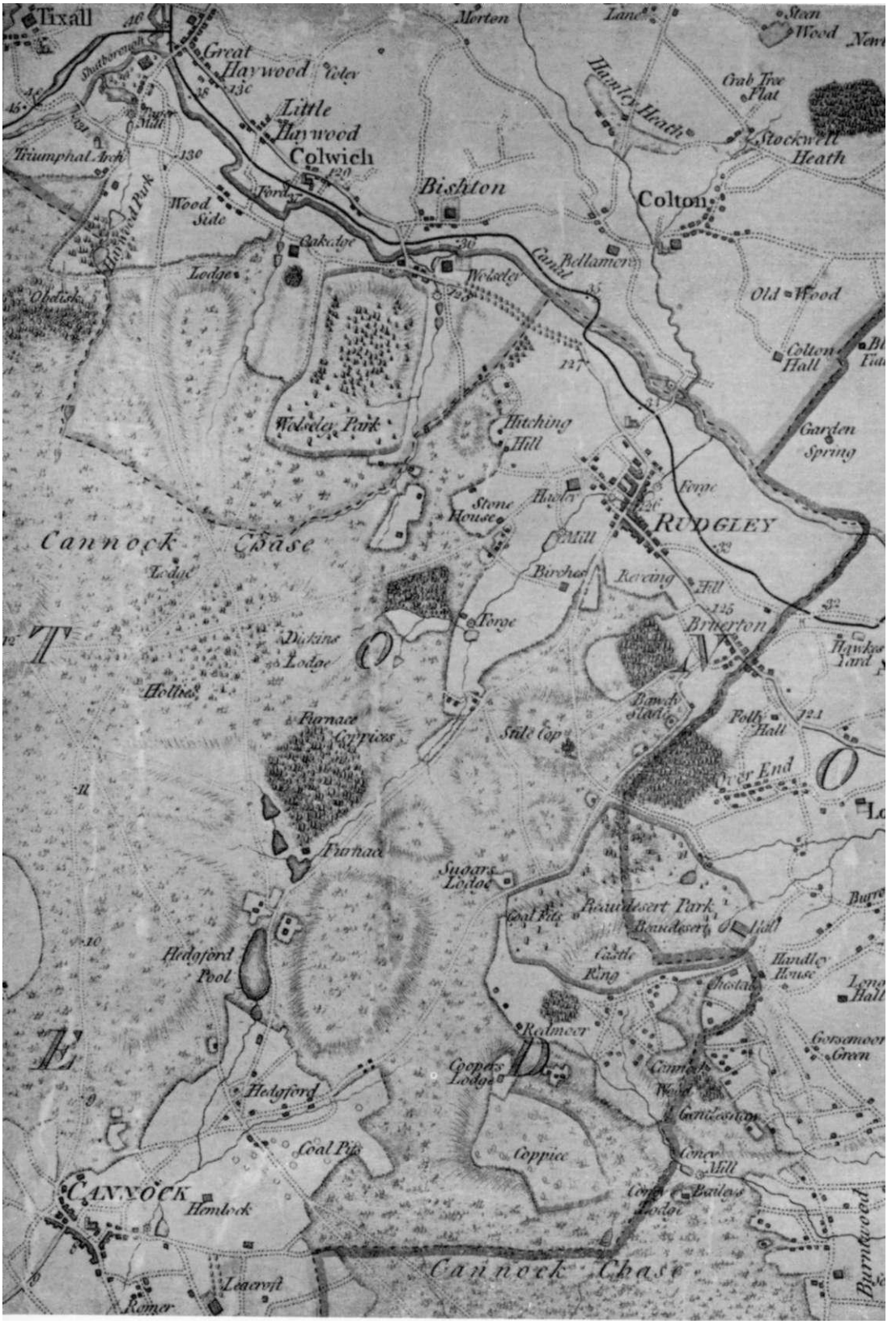

Fig. 1 Yates' map of Staffordshire (part), 1775 ***Scale:*** 1 ***in. to*** 1 ***mile (approx.)***

THE RECONSTRUCTION OF AN INDUSTRY, THE PAGET IRONWORKS, CANNOCK CHASE, 1561

GEO. R. MORTON*

INTRODUCTION

THE INTRODUCTION OF THE BLAST FURNACE as an iron producing unit necessitated a major reconstruction of the seventeenth-century iron industry in Great Britain. Previously malleable bar was made direct from the iron ore in a two stage process, and since production rates were low - in the order of two cwt. of finished bar per day per furnace - and the yield only about 12^% from ore to bar, requirements in terms of water power were also low.

The new pattern comprised a blast furnace, producing high carbon pig iron, the blast for which was provided by two pairs of leathern bellows driven by a single water-wheel, followed by decarburizing the brittle pig iron in a finery hearth, reheating in the chafery fire, hammering to bar, and possibly slitting into the form of rod. Each of these latter processes, i.e. finery, chafery and hammering, required individual water-wheels, thus the water requirements were very much greater than for the blast furnace alone. In consequence the industry adopted a non-integrated pattern in which the blast furnace became established in regions of relatively low water supply, whilst the forges usually migrated further down stream where a much greater water supply could be obtained.

In this paper the writer endeavours to reconstruct, by material remains and documentary evidence, the Paget ironworks unit based on the blast furnaces situated on the Rising Brook, near Hednesford (known as the Cannock furnace), and at Teddesley. The Cannock ironworks are shown in the section of Yates' map for Staffordshire which was compiled between 1769 and 1775, fig. 1.

THE RAW MATERIALS

IRON ORE

The iron ore used in the blast furnace was obtained from the Walsall outcrop. Plot[1] gives a detailed account of the iron ore in and around Rushall, and the 1903 geological survey cites a second source in the Delves (Walsall) area.

This ore was, in general, of high quality and was used for the production of tough iron, i.e. bar iron with high malleability and not brittle whether worked cold or hot. 'Coldshare', 'Coleshare', or 'Colshewe' (cold-short) iron on the other hand, lacked malleability when cold, due to the high phosphorus content of the iron ore which could not be removed in subsequent treatment, and which therefore found its way into the finished bar, rendering it brittle when worked cold. This type of iron was extensively used for the manufacture of nails. High phosphorus iron ores were found in the Wednesbury area.

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[1] Plot, R., ***The Natural History of Staffordshire,*** 1686, pp. 161-4.

Accordingly the pig iron was designated 'tough' or 'cold-short', and depending upon the ore used, pig iron of two grades were produced for refining into the respective grades of bar at the forge. Evidence of these grades is seen in the inventory of the Cannock furnace and forge in appendix 1[2].

At this stage it is interesting to note that each sow weighed approximately 10 cwt., a fact which rules out the possibility of transport by pack mule.

In a recent excavation at Bourne Pool, Aldridge, Gould[3] uncovered quantities of iron ore of the period 1500-1600, and since the Walsall orefield was the nearest supply it is reasonable to assume that it would be typical of that used between 1561 and 1700 at the Cannock furnaces.

The analysis of this ore is given in Table 1.

	%		%
Ferric Oxide (Fe_2O_3)	55-71	Lime (CaO)	0-50
Ferrous Oxide (FeO)	6-94	Magnesia (MgO)	4-68
Silica (SiO_2)	14-40	Phosphorus (P)	0-06
Alumina (Al_2O_3)	8-46	Sulphur (S)	0-014
Manganese (Mn)	0-14	Total Iron	44-40
		Loss on ignition	8-00

Table 1 - Analysis of Ore found at Bourne Pool

The iron ores of the Black Country were in general of the carbonate type, usually with relatively high phosphorus content. That found at Bourne Pool, however, contains no carbonate, and with very low phosphorus and sulphur content it was undoubtedly used for the production of highly malleable iron, i.e. tough iron. Thus there is every possibility that the ore found by Gould and members of our Society is actually the ore referred to by Plot as 'mush' which was mined in and around Rushall (Walsall).

All iron-stone was purchased by the load, and the cost of a load varied between ***3s.*** and ***3s. 6d.*** The exact quantity of ore contained in a load is somewhat difficult to ascertain - perhaps the only possible clue to the quantity can be found in a letter dated 6 December 1571[4] from John Tyror, agent to Sir Francis Willoughby, in connection with the proposed building of a furnace at Middleton, near Sutton Coldfield.

THE FUEL

At the time of the introduction of the blast furnace to Cannock Chase the forests of Brewood, Cannock and Needwood formed a dense, heavily wooded area between the rivers Penk and Trent.

Wood contains a large proportion of water, and for this reason cannot be used as a fuel where high temperatures are required. If, however, it is subjected to a process of distillation, the volatile compounds are driven off, leaving carbon in the form of charcoal, and a small quantity of ash. Because the ash and impurity content of well-coked charcoal is low, it can be considered essentially as available carbon.

[2] **In this Paper, roman figures in original sources have been transcribed in arabic for clarity; in the originals, 'di' is frequently used for a half.**

[3] **Gould, J., Excavation report, in preparation.**

[4] **Pelham, R. A., The Establishment of the Willoughby Works in North Warwickshire in the 16th century, *University of Birmingham Historical Journal,* iv, No. 1, 1953-4.**

Thus the abundance of timber provided an ideal fuel for ironmaking. Consumption of wood as charcoal was exceedingly high, and in 1578 some 3821 trees were felled in the Chase area for this purpose[5].

The standard wood measure was the 'crown cord', which comprised four foot lengths of cordwood stacked four feet high, the stack being eight feet long. A cord of wood thus stacked weighs approximately one ton. According to Rhys Jenkins[6], who obtained his information from a present-day charcoal producer, three crown cords will produce one ton of charcoal.

In a letter to Paul Foley dated Haywood, 14 October 1691, John Wheeler, a partner in the Moorland Works of the Foley combine, developed a 'calculation of the produce of a Furnace and Forge in ye Forest of Dean'. This letter is reproduced in appendix 2, and in connection with the consumption of wood he states:

> 6 long cords of wood will not make above **2** loads 2 sack and a half of Coles generally wth 2 lo ***2%*** sac of Coles will not make above one Ton of sow iron generally

In the inventory of Cannock Chase furnace for the 23 February 1570/1 (appendix 1) the following items appear:

At the furneyes	Cordes of woode 842^ at ***5d.*** a piece	£15 11*. ***O^d.***
	Cooles 4 score loade a 4/- a lod	£16
At the forge:	Cooles 160 loads at ***5s. Id.***.	£41 6s. ***%d.***
	Cordes of wood 559 at ***Id.***.	£17 ***Ad.***
	Trees cropped uncute 600	66s. ***8d.***

From the foregoing information it is possible to reconstruct the extent of the fuel preparation stage of the industry. A cord of wood covers an area of 8 ft. **X** 4 ft. = 32 sq. ft., and if a spacing of 2 feet between each cord is assumed, then the area covered by the '842'; cordes of woode' stated in the inventory would be approximately 1^ acres.

Thus the area occupied by the stacked cordwood awaiting coaling would be approximately 70 yds. **X** 80 yds., and if stacked two cords high, the area would be 70 yds. **X** 40 yds. On the basis of six cords for each ton of iron produced, and a furnace output of one ton per day[7] - this quantity would satisfy the needs of the furnace for 140 days. In addition 80 loads of charcoal at the site would suffice 35 days - in all 175 days. By 1650, however, the output of charcoal furnaces had risen to ***2***\ tons per day, when the above quantities would have been sufficient for only 70 days[8].

[5] **Anderson, Beryl I., 'Five Tudor Ironworks 1578', dissertation, Economic History Dept., Nottingham University.**

[6] **Jenkins, Rhys., Ironmaking in the Forest of Dean, *Trans. Newcomen Society,* 1925-6, vi, p. 60.**

[7] **Schubert, H. R., *History of the British Iron and Steel Industry,* 1957, p. 347.**

[8] **Plot, R., op. cit., p. 164.**

FURNACE POOLS

The characteristics of furnace pools were controlled by the nature of the process and the quantity of water required to satisfy the needs of the water-wheels. Thus since the blast furnace required charging at the 'high line', some 20 feet above the casting floor, such furnaces were usually built adjacent to the sloping side of a hill, possibly in a shallow valley which was readily dammed to provide a furnace pool of reasonable depth and small surface area. In contrast, all work in the forge was performed at floor level which meant that the 'valley' requirement was removed and pools of much larger area, holding greater quantities of water, were established.

Whilst the above factors were of prime importance, additional points such as the availability of materials for the construction and maintenance of the plant and furnaces were taken into consideration. Both Cannock and Teddesley furnaces were in close proximity to outcrop sandstone, and near to Bromley forge and Teddesley furnace remains of marl-pits are still to be found. Sandstone was used for the furnace bosh, hearth, and general construction; marl bricks for the internal structure of the furnace stack. In the case of the site of Teddesley furnace a small bank to provide the high line was available, sandstone and marl ready at hand, and the lie of the land suitable for damming to provide the necessary head of water to drive the water-wheel. This pool was somewhat larger in surface area than the Cannock pool, and although drained, can still be traced.

Teddesley ironworks was constructed between May and December 1578, and the dam of the furnace pool in June of that year - this was obviously an early stage of the construction in order that a sufficient supply and head of water might be built up in readiness for the first campaign. From the accounts[9] it appears that the ground work was undertaken by five labourers, working in all 98 man-days, who used turves and clay carried to the dam over a period of 12 days, in addition to using a quantity of turf and clay from the site.

An item in the accounts immediately following the above details reads, 'For making a payre of gates for the furnace ***2s. Sd.'*** This possibly refers to the construction of sluice gates to control the supply of water to the water-wheel, and when closed the pool was allowed to fill to the level at which the excess overflowed by means of a ditch at the far end of the dam, into the original stream below the furnace site. There is a well-defined race leading from the pool, and the water-wheel driving the bellows would be situated along this, with the furnace structure in close proximity.

THE BLAST FURNACE PLANT

Two blast furnaces, Cannock and Teddesley, come within the scope of this Paper. Of the Teddesley furnace, records relating to the original construction in 1578 exist[10], and recent excavations through a slag heap at the Cannock site uncovered the discard from an early reline[11]. These details, supplemented by information from other sources[12] regarding furnaces in other districts enables a typical layout to be drawn.

[6] **Anglesey Papers, D 1734/3/3/212, W.S.L.**
[10] **Anderson, Beryl I., op. cit., Appendix F.**
[11] **Morton, G. R., Historical Note, *Bulletin of Historical Metallurgy Group, No. 2,* Dec. 1963.**
[12] **East Suffolk County Record Office, Ipswich, North MSS.**

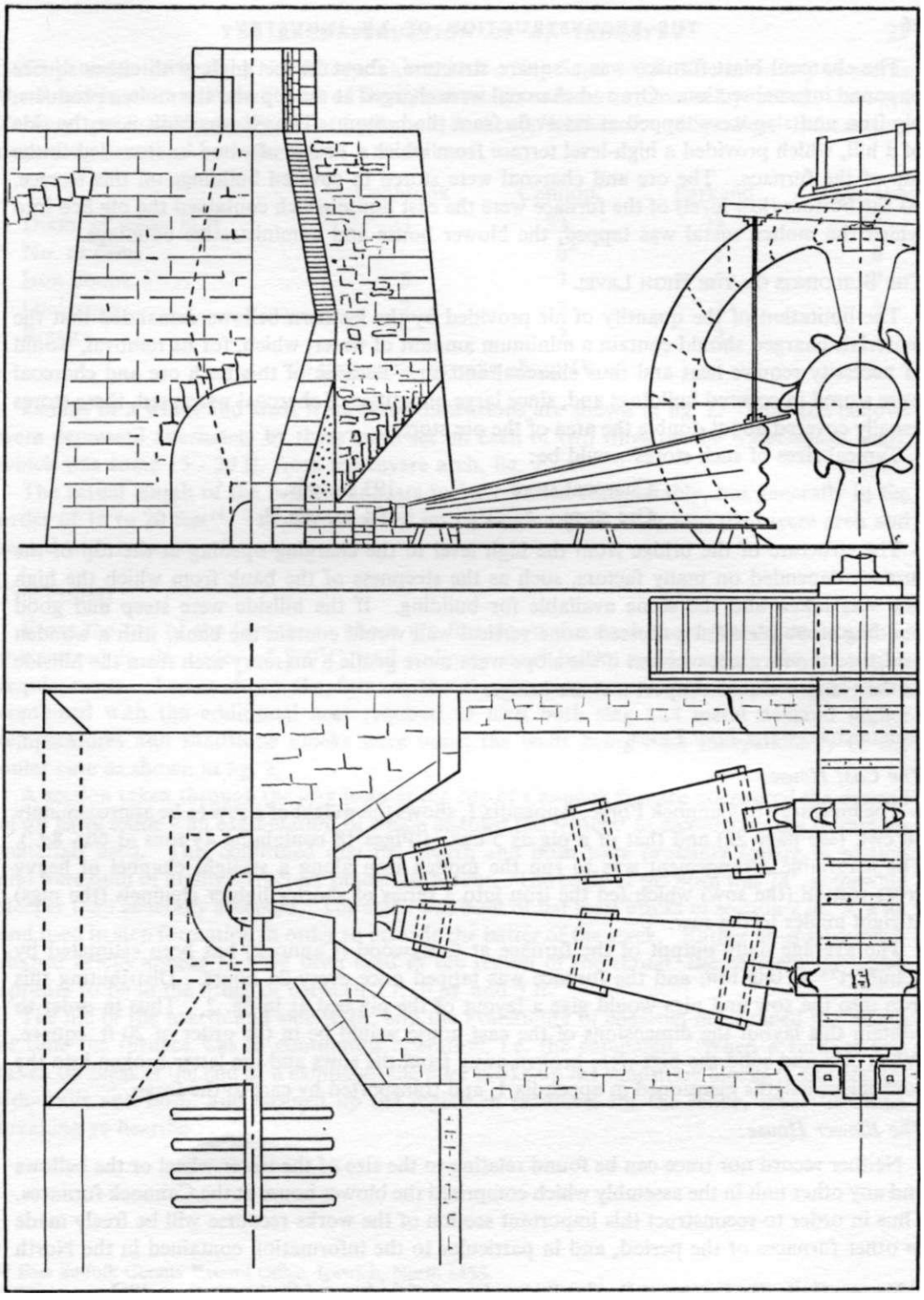


Fig. 2 Reconstruction of blast furnace

The charcoal blast furnace was a square structure, about 20 feet high, with either square or round internal section. Ore and charcoal were charged at the top and the molten products, pig iron and slag were tapped at intervals from the bottom. Thus it was built near the side of a hill, which provided a high-level terrace from which a bridge of wood or stone led to the top of the furnace. The ore and charcoal were stored in covered buildings on this terrace. At the bottom (low level) of the furnace were the cast house which contained the pig bed into which the molten metal was tapped, the blower house and administrative buildings.

THE BUILDINGS ON THE HIGH LEVEL

The limitation of the quantity of air provided by the leathern bellows demanded that the materials charged should contain a minimum amount of water, which, for its removal, would of necessity require heat and thus charcoal and air. Because of this both ore and charcoal were stored in covered buildings and, since large quantities of charcoal were used, these stores usually covered about double the area of the ore store.

Typical sizes of such stores would be:

Charcoal store .	193 sq. yds.
Ore store . .	94 sq. yds.[13]

The structure of the bridge from the high level to the charging opening at the top of the furnace depended on many factors, such as the steepness of the bank from which the high line was taken and the stone available for building. If the hillside were steep and good building stone plentiful a dressed stone vertical wall would contain the bank, with a wooden bridge to the furnace, whereas if the slope were more gentle a masonry arch from the hillside to the furnace would support a stone bridge.

BUILDINGS ON THE LOW LEVEL

The Cast House:

The inventory of Cannock Forge, Appendix 1, shows the weight of a sow to be approximately 10 cwt. (see page 22) and that of a pig as 5 cwt. ('Piggs 18 containing *A*\ tons at 66s. 8«/.'). The invariable arrangement was to run the molten iron along a straight channel of heavy cross-section (the sow) which fed the iron into a series of shorter lighter channels (the pigs) at right angles to the sow.

The average daily output of the furnace at Cankwood (Cannock) has been estimated by Schubert[14] as one ton, and the furnace was tapped once every 24 hours. Distributing this iron into the sow and pigs would give a layout of the pig bed as in fig. 2. Thus in order to contain this layout the dimensions of the cast house would be in the order of 20 ft. square. When cast and solid the pigs were broken away from the sows and the latter broken into the convenient lengths mentioned in appendix 1, and transported by cart to the forge.

The Blower House:

Neither record nor trace can be found relating to the size of the water-wheel or the bellows and any other unit in the assembly which comprised the blower house at the Cannock furnaces. Thus in order to reconstruct this important section of the works recourse will be freely made to other furnaces of the period, and in particular to the information contained in the North

[13] **Morton, G. R., The Furnace at Duddon Bridge,** ***Journal of the Iron and Steel Institute,*** **cc, 1962.**

[14] **Schubert, H. R., op. cit., p. 347.**

MSS.[15] under the heading 'Inventory, Taken 24th - 28th Sept. 1635'. The inventory concerns the Royal Ironworks in the Forest of Dean, and relates to blast furnaces at Lydbrook, Cannop, Parkend and Soudley, and forges at Lydbrook, Parkend, Whitecroft and Soudley. Information regarding the wheel and wheelshaft is as follows:

	Lydbrook	Cannop	Parkend	Soudley
Diam. of wheel in ft.	23	22	22	22
No. of cams		6 *	6	6
Iron hoops	6	7	7	7
Gudgeons	2	2	2	2
Brasses	2	2	2	2

*'6 iron cams weyeing about IV c,'

Details of a wheel and shaft from these dimensions are shown in fig. 2. Thus the bellows were depressed alternately by three cams set on each of two rings on the water-wheel shaft, which was some 15-20 ft. from the tuyere arch, fig. 2.

The actual length of the bellows appears to have varied considerably, but generally in the order of 18 to 20 feet[16]. The blast was fed into a single tuyere, built into the tuyere arch and sealed with refractory fire-clay.

THE LINING

From the top of the furnace to about ten feet down the stack the temperature would be maintained in the order of 800°C. and ordinary marl bricks would satisfy the refractory requirements. Lower down the furnace the slag-forming reactions take place and these combined with the additional heat required to melt both slag and metal demand higher temperatures and sandstone blocks were used; the walls being built independently of the outer case as shown in fig. 2.

A section taken through the slag heap at the site of Cannock furnace uncovered the discard of an early reline - an examination of which enabled the writer[17] to reconstruct the refractory materials used. This confirmed that the hearth and bosh were probably square in section and were built of highly refractory sandstone blocks. The angle of the bosh was 78°, somewhat steeper than generally accepted. The stack was built of flat marl bricks of section 2 in. x 4 in. and used in step formation in order to provide the batter of the stack. Rather unusual curved-shaped bricks appear to have been used in the region of the throat, the diameter of which appears to be in the order of between 2 ft. 6 in. and 3 ft.

The life of the hearth and side-walls, and the availability of charcoal determined the length of time the furnace was in continuous operation, i.e. the campaign. When a furnace was taken off blast at the end of a campaign the filler broke up the sandstone blocks in the hearth, side-walls and bosh, and cleaned up the region in readiness for the reline, thus: 'Redman breaking ye hearthe . . .'

[15] **East Suffolk County Record Office, Ipswich, North MSS.**

[16] **Yarranton, Andrew, *Englands Improvements by Land and Sea, 1616/1.***

[17] **Morton, G. R., Historical Note, *Bulletin Historical Metallurgy Croup, No. 2,* Dec. 1963.**

THE CAMPAIGN

PAYMENT OF FOUNDERS AND FILLERS

In the accounts[18], payments to the founder and filler are of two kinds; one dealing with the day to day charging and casting of the furnace and the other for special work such as repairs to the furnace structure, the manufacture of castings, etc.

Payments for the running of the plant are made in terms of 'foundes' and 'days', and it appears that the founde covered a period of six producing days at the furnace. The term 'founde' appears to have originated from the Sussex term 'founday' as mentioned by John Ray[19], and the contraction 'founde' was possibly carried to the Cannock Chase works by a workman brought from Sussex when the blast furnace was introduced into the Midlands in 1561. Ray states:

> Every six days they call a 'founday', in which space they make eight tun of iron, if you divide the whole sum of the iron made by the foundays; for at first they make less than a founday, at last more.

The founde, therefore, was a period of six working days for which the founder was paid twelve shillings, i.e. two shillings a day, but from this he paid for the labour sub-contracted by him. These periods of foundes and days are confirmed by entries in the accounts:

4 foundes 1 day . .	= 50.y.	24 Dec. 1577.
3 foundes 2 days . .	= ***40s.***	17 Oct. 1577.
3 foundes 3 days (i founde)	= 425.	29 Nov. 1577.
4 foundes 4 days . .	= 56s.	27 Sept. 1577
3 foundes 5 days . .	= ***46s.***	15 Feb. 1576/7.

DETAILS OF CAMPAIGN 1576 - 8, OLD FURNACE

1576/7		
15 Feb.	[Last tap of old campaign.]	
	To John Symons for 3 foundes & 4 dayes	***46s.***
27 Feb.	[Furnace idle.	
	Note in New Furnace accounts:-]	
	Given him [founder] because of the standing still of the other furnace.	***.\3s. 5d.***
23 March	[Masons at work.]	
	To GryfTyn the Mason and his 3 men for 7 dayes at the furnace	***22s. 2d.***
	To the Founder for helping to make the furnace walls & for making of the hearth.	.20*.

It appears therefore that during the period 15 Feb. to 23 March, the furnace was allowed to cool, the hearth and side-walls of the bosh removed by the filler, the necessary repairs made to the stack, and the hearth and side-walls completely rebuilt. During this period the founder was responsible for the supervision of the reline, and usually set the hearth in place in person. This would be followed by a period of drying out, termed 'seasoning', followed by the commencement of the new campaign.

[18] **Anglesey Papers, D 1734/3/3/212, W.S.L.**

[19] **Straker, E., *Wealden Iron,* 1931, p. 45.**

1577
6 April To John Symons for *i* foundes. . . . . *.6s.*

This means that the first tap of the new campaign took place three days before 6 April, i.e. 3 April.

Also for the same date there is an entry:
6 April To Redman (filler) for 2 foundes & 2 dayes . . . .

Since the filler was responsible for the drying out of the furnace, it can be inferred that this operation commenced on 23 March, which agrees with the date of reconstruction. The actual drying time cannot be ascertained from the accounts, but if it is assumed that the period occupied eight days[20], then the commencement of the new campaign would be on 31 March. This means that the first tap of pig iron from the furnace was made some three days after the commencement of the campaign.

27 April To John Symons for 2 foundes and 4 dayes . . . . 32*.
for making hearth . . . . . *6s. 8d.*

It appears that after working 16 days, adjustments to the structure became necessary, possibly causing a temporary shut-down. From the entry, 2 foundes and 4 days = 1 6 days, therefore the furnace did not cast for five days during the period 7 April to 27 April (21 days).

11 May To John Symons for 2 foundes & 2 dayes. . . . *.28s.*
[20 April to 11 May = 14 days]
25 May To John Symons for 2 foundes & 2 dayes . . . . . *28s.*
[12 May to 25 May = 14 days]
15 June To John Symons for 3^ foundes. . . . . .42*.
for dressing bellows and walls. . . . . *.\0s.*
[26 May to 15 June = 21 days]

Dressing the walls consisted of removing slag accretions from the walls - this was common practice, and was aided by the use of a long hooked tool. Minor adjustments of this type were made with the furnace temporarily off blast.

6 July To John Symons for 3 J foundes . . . . . 42y.
for casting his hammer and anvils . . . . . *6s. 8d.*
[16 June to 6 July = 21 days]

In order to make castings, molten metal was ladled out of the forehearth and poured into prepared moulds.

27 July To John Symons for *3$* foundes. . . . . *.42s.*
[7 July to 27 July = 21 days]
17 Aug. To John Symons for 3 \ foundes . . . . . *42s.*
[28 July to 17 Aug. = 21 days]
7 Sept. To John Symons for *3$* foundes. . . . . .42s.
[18 Aug. to 7 Sept. = 21 days]
28 Sept. To John Symons for 3\ foundes. . . . . *.42s.*
for making hearth and mending bellows. . . . *.6s.*
for casting hammer and anvils . . . . . *6s. 8d.*
[8 Sept. to 28 Sept. = 21 days]

[20] **Morton, G. R., The Use of Peat in the Extraction of Iron from its Ores,** *Iron & Steel,* **xxxviii, No.** 9, **Aug.** 1965, p. 421.

Minor repairs to the hearth were made when the metal had been tapped from the furnace.

19 Oct.	To John Symons for 3^ foundes	42*.
	[29 Sept. to 19 Oct. = 21 days]	
9 Nov.	To John Symons for 3| foundes	42*.
	[20 Oct. to 9 Nov. = 21 days]	
29 Nov.	To John Symons for 3^ foundes	42*.
	[10 Nov. to 29 Nov. = 20 days]	
24 Dec.	To John Symons for 4 foundes & 2 days	52*.
	for casting hammers and anvils	10*.
	[30 Nov. to 24 Dec. = 25 days]	
1577/8		
18 Jan.	To John Symons for 4 foundes & 4 days.	58*.
	[25 Dec. to 18 Jan. = 25 days]	

[Furnace taken off blast.
Total time of campaign: 23 March 1576/7 to 18 January 1577/8.
Time lost through breakdown: 5 days, between 6 April and 27 April.]

The reason for the discrepancy between the calendar days and founde days for the months November, December and January is not clear, there may have been an increased number of taps due to wear in the furnace lining.

Production details are not available from the records. If, however, a quantity based on Ray's definition of a 'founday' is assumed, then for a total of 48 foundes and 2 days, (i.e. the complete campaign) some 386 tons of pig iron would have been produced.

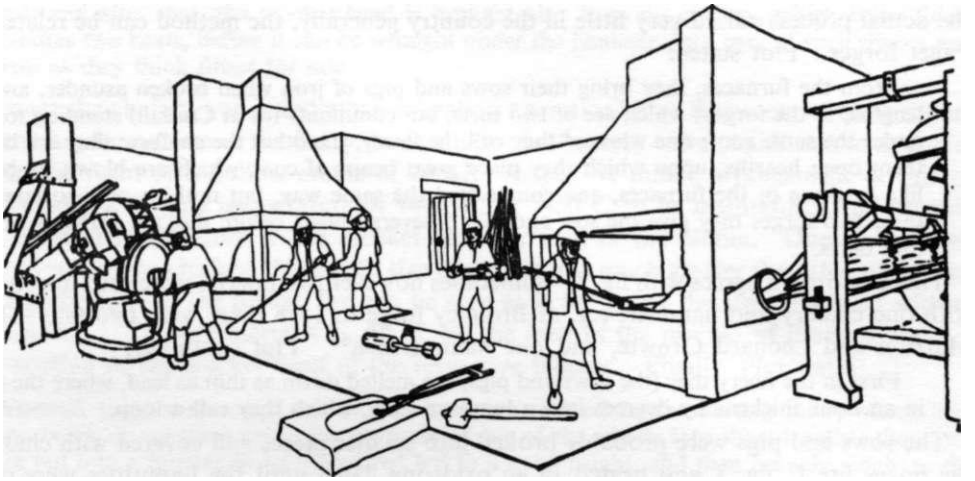
THE PRODUCTS OF THE FURNACES

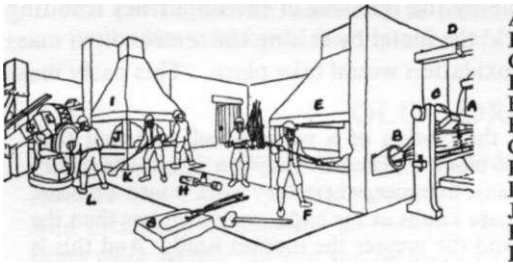
Apart from occasional castings the products of the furnaces were two types of pig iron, tough and cold-short, and slag. The pig iron was transported to the forges at Cannock (near Slitting Mill) and Abbots Bromley, where they were worked up into malleable bar for sale to the user industries.

The slag was deposited on waste heaps in the vicinity of the furnaces. A well-defined heap is still to be seen at the site of Cannock furnace, and although slag remains are to be found at Teddesley furnace, the majority has been removed for roadmaking. These slags can be identified as typical charcoal blast-furnace slags, being highly siliceous and bottle-green in colour, often with many pieces of entrapped charcoal and small particles of iron.

THE PRODUCTION OF MALLEABLE BAR

The brittle pig iron from the blast furnaces was converted into the wrought malleable product by 'fining' in a finery hearth, and afterwards reheating in a chafery fire from which it was taken and hammered into the form of bar or rod. The forge thus consisted of three units, - finery, chafery and hammer, and during the Paget era, these were housed in the same building. A typical layout of such a forge is given in Fig. 3.





A. Water Wheel
B. Bellows, breach end entering tuyere
C. Cam on wheel axle
D. Beam of return mechanism for bellows
E. The finery hearth
F. The finer working the heat
G. A loupe with tongs fitted
H. Half-blooms awaiting reheating for drawing into bar
I. The chafery fire, (note beehive shape)
J. The beehive 'muffle'
K. Heated ancony end ready for the hammer
L. The hammer-man at work

Fig. 3. The Interior of a Typical Finery Forge and Chafery

Two forges, Cannock and Bromley, were included in the Paget ironworks, and although there were many others in the neighbourhood, e.g. Little Aston, Hints, Brewood, Coven, Congreve, Rushall etc., there is no evidence of them being supplied with iron from Cannock or Teddesley furnaces.

Transport of the sows and pigs to the forges was obviously by cart, but the route from Teddesley to Bromley forge is somewhat uncertain, and that via Cank Thorn, 'Sow' or South Street, and Colton is worthy of further investigation.

During the period under consideration charcoal was the only fuel used in the finery and chafery, and trees were felled, corded and coaled independently of those for the blast furnace. Water provided the motive power for depressing the leathern bellows which in turn produced the blast for the hearths, and also for the 'great hammers', thus the necessity for a greatsr supply of water than that required for the blast furnaces.

THE PROCESS

The accounts for Bromley forge give little evidence of the actual processes of fining and hammering, but a reasonable description is given by Plot[21] and, since it can be assumed that the actual process varied very little in the country generally, the method can be related to the Paget forges. Plot states:

> From the furnaces, they bring their sows and pigs of iron when broken asunder, and into lengths, to the forges; which are of two sorts, but commonly (as at Cunsall) standing together under the same roof; one whereof they call the finery, the other the chafery; they are both of them open hearths, upon which they place great heaps of coal, which are blown by bellows like to those of the furnaces, and compressed the same way, but nothing near so large. In these two forges they give the sow and pigs 5 severall heats before they are perfectly wrought into barrs.

This description agrees with fig. 3 - sometimes however two fineries were used in conjunction with one chafery and hammer, e.g. at Bromley forge in 1578 there were two finers, Richard Marrion and Leonard Growte, and one hammerman[22]. Plot continues:

> First in the finery they [the sows and pigs] are melted down as thin as lead, where the metall in an hour thickens by degrees into a lump or mass, which they call a loop.

The sows and pigs were probably broken into smaller pieces and covered with charcoal on the finery fire E, fig. 3, and heated in an oxidizing flame until the impurities were removed and the metal assumed the form of a pasty lump in the hearth. In order to ensure that the metal had 'come to nature' i.e., become malleable by the removal of the impurities resulting from the smelting operation, the finer would 'work' the metal by raising the semi-molten mass into the tuyere zone, and remelting when further oxidation would take place. This pasty mass was termed a 'loop' which to continue:

> this they bring to the great hammer raised by the motion of a water-wheel, and first they beat it into a thick square which they call a half-bloom. Then 2[ly] they put it into the finery again for an hour, and then bring it again to the same hammer, where they work it into a bloom, which is a square barr in the middle, and two square knobs at the ends, one much less than the other, the smaller being call'd the ancony end, and the greater the mocket head. And this is all they doe at the finery.

Before the loop was taken to the hammer it was usual to hand forge it into a rough shape and firmly fix a pair of tongs to facilitate handling under the hammer - this is shown at G, fig. 3. After it had been forged into the thick square form it was plunged into the slag of the finery hearth for a sufficiently long time (one hour) to give sufficient reheat to enable the ancony end to be formed. During this reheating stage preparation for the next refining cycle was carried out, thus the excess heat contained in the finery slag was utilized and the chafery relieved of one operation. A typical bloom is shown in fig. 4.

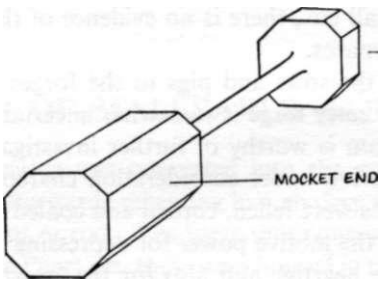


Fig. 4. A Bloom Ready for Reheating in the Chafery

[21] **Plot, R., op. cit., p. 163, paras. 24-5.**

[22] **Anderson, Beryl I., op. cit., p. 70.**

Discussing the third heat Plot quotes:

> Then 3. the ancony end is brought to the chafery, where after it has been heated for a quarter of an hour, it is also brought to the hammer, and there beat quite out into a bar, first at that end; and after that, the mocket head is brought also 4. to the chafery, which being thick, requires two heats, before it can be wrought under the hammer, into bars of such shapes and sizes as they think fittest for sale.

Because the chafery was essentially a reheating operation these fires were of quite different construction from those of the finery, being made of refractory culm (small charcoal, slag and clay) in the form of a hollow muffle of beehive shape. A muffle arrangement of this type would enable a forging temperature of 1400°C. to 1450°C. to be maintained, and provide a more uniform temperature to the mocket head (or end) of the bloom. Due to the hollow beehive form of the chafery, the overall size of the fire was much greater than that of the finery - the rough shape of the hollow fire can be seen at J, fig. 3 and the size compared with that of the finery. The hammerman L, fig. 3, can be seen in the process of drawing down the latter portion of the mocket head of the respective blooms. Finally, Plot states:

> Whereof, those they intend to cut into rods, are carryed to the slitting mills, where they first break or cut them cold with the force of one of the wheels into short lengths; then they are put into a furnace to be heated red hot to a good height, and then brought singly to the rollers, by which they are drawn even, and to a greater length: after this another workman takes them whilst hot and puts them through the cutters, which are of divers sizes, and may be put on and off, according to pleasure: then another lays them straight also whilst hot, and when cold binds them into faggots, and then they are fitting for sale.

OLD FORGE ACCOUNTS

Whereas payments to the forge workers were made at the same periods as those to the furnace employees, no sequence of time such as foundes can be identified. The amount of iron produced is, however, stated-but this appears to be arbitrarily divided from the two or three week period used at the furnaces to a weekly basis, and the finer and hammerman paid on the iron produced, e.g.:

6 April 1577

Iron made	Iron made in the week ending the 30th of March	2 tons 10 cwt.	"1 [- 5 tons 4^ cwt.
	Iron made in the week ending the 6th of April	2 tons 14^ cwt.	J
Fyner	To Mathews for fynyng the said iron		34*. *lOd.*
Hammerman	To Porter for hamering the said iron.		34*. *lOd.*

27 April 1577

Iron made	Iron made in the week ending the 13th of April	1 ton 10 cwt.	
	Iron made in the week ending the 20th of April	*2* tons 13 cwt.	> 6 tons 16 cwt.
	Iron made in the week ending the 27th of April	*2* tons 13 cwt.	
Fyner	To John Mathews for fynyng the said iron		45*. *4d.*
Hammerman	To Porter for hamering the said iron		45*. *4d.*
	for cutting his hammer.		*Iid.*

['cutting his hammer' means dressing the damage to the cast iron hammer, which was of a somewhat brittle nature and suffered damage during the forging operation.]

7 September 1577				
Iron made	Iron made in the week ending the 24th of August	2 tons 7 cwt.	7 tons 2 cwt.	
	Iron made in the week ending the 31st of August	2 tons 7 cwt.		
	Iron made in the week ending the 7th of September	2 tons 8 cwt.		
Finer	To John Mathews for fynyng the said iron			47*s.* 4*d.*
	to hym for mendyng his morris			7*d.* (?)
Hammerman	To Porter for hamering the said iron			46*s.* 4*d.*

Mention of 'his morris' is of some interest inasmuch as the use of morris bars was common on the Continent prior to 1550[23]. Thus the mention in the ironworks accounts is perhaps one of the earliest records of the use of morris bars in this country.

The morris consisted of a hardwood shield, covered with clay and supported by the morris bar in such a position as to protect the finer from the glare of the fire.

During the comparative period of the campaign of the old blast furnace some 112 tons 8f cwt. of malleable bar iron were produced, which would require some 140 tons of pig iron.

THE SITES TODAY

Evidence of the various works which make up the complete pattern is still to be found, and whereas the dates of termination of each individual item, or the addition of a new phase are not known, it is certain that the life span of several units extended over more than one hundred years.

With the exception of the Teddesley furnace the units are perhaps best identified approximately by the aid of Yates' map, fig. 1. Bearing in mind the water power requirement (page 24), the number of streams that satisfy this condition is limited to those which flow into either the River Penk or the River Trent. Towards the Trent, Rising Brook is perhaps the strongest, and it is upon this brook that Yates' map located a furnace, forge and mill.

The products of each unit of the assembly were useful iron, either pig or bar, and residue material in the form of slag. During the life span of the various works considerable accumulations of the waste material would have developed, each type being characteristic of the particular process being operated by the unit. Thus the slag product from the blast furnaces would be siliceous in nature, showing a bottle-green to green-grey glassy fracture, often with entrapped pieces of charcoal, and small particles of iron which did not separate from the molten slag. These particles are now generally in such an oxidized condition that chemical identification is impossible. Such slags were, in later years, considered a useful material for road-making, and large quantities were removed from the Teddesley site for this purpose, with lesser amounts from the Cannock furnace.

On the other hand the waste product of the finery forges and chaferies was a dark, brown-black, very heavy slag containing in the order of 30 per cent of iron. These slags are usually found either in large granulated form, or as 'pot-bottoms', 'gits' or 'ham-bones', which are lumps of up to 56 lb. in weight, usually rounded at the underside - evidence of being run out of the furnace into a sand impression underneath. Being so rich in iron, large quantities were taken away at the end of the last century and early in the present century for resmelting in the blast furnaces of the Black Country. Again the furnace pool requirement applies, but as

[23] **Schubert, H. R., op. cit., p. 160.**

previously stated, due to the greater number of water-wheels in use, the pools were of larger area than those for the blast furnace.

In addition to slag, a further waste material in the form of spent charcoal from the day-to-day clean-out of the finery and chafery fires accumulated in large heaps.

A further clue to the identification of sites can be found in place and field names, thus: Furnace Coppice, Cynder Field, Slitting Mill, Forge Farm, etc.

Armed with this knowledge, field work along the Rising Brook Valley revealed the site of Cannock blast furnace (Nat. Grid SK 009139), at a point about one mile beyond Hednesford on the Cannock-Rugeley road, where a road at right angles to the main road, leads to Cannock No. 5 colliery. Standing on this road, at a point about 50 yds. from the main road, and facing Rugeley the slag heap can be seen in the hollow below. The wheel race can still be traced though little other detail can be seen, but further examination and excavation would probably determine the site of the 'old furnace' and the 'new furnace'[24].

Continuing along the Fair Oak road towards the hamlet of Slitting Mill - in the grounds of Fair Oak House, many traces of forge slag, and furnace bricks with their faces heavily coated with slag, etc., are to be found. A large overgrown heap is worthy of examination. This then appears to be the site of Cannock Forges (Nat. Grid SK 026167), which operated as a part of the Staffordshire Works of the Foley combine[25], and of which John Wheeler (appendix 2) was a partner.

The slitting mill (Nat. Grid SK 034174), from which the hamlet takes its name, was a later addition, being introduced in the area in 1622-3, and was the first of its kind to appear in the Midlands[26]. This mill was still in operation in the nineteenth century, but was unfortunately demolished to establish the pumping station now occupied by the South Staffordshire Water-works Co. Here again slag residues have been taken away for resmelting.

In a similar way the iron-bearing slag in the vicinity of Bromley Forge (Nat. Grid SK 082227) has also been removed, however many lumps of various sizes, well distributed over the area, can still be found. Here a large spoil heap of waste charcoal intermixed with slag globules and the rake-out of furnace fires still exists, and the area once occupied by the furnace pool can be traced. The site is on the land occupied by Forge Farm and is near to the farm buildings.

The site of Teddesley furnace (Nat. Grid SJ 947144) provided somewhat of a problem since Yates shows no pool in the area. However, a search among the early maps held at the William Salt Library revealed a 'Cynder Field' in the vicinity of Hazel Mill. The site was traced at Bangley Farm near Newtown, on the road from Pottal Pool to Penkridge, and the existence of the furnace appeared to be well known by the farmer and his sons. Here the dam of the furnace pool remains in good order, and although the pool is drained, its extent can still be seen.

In an excavation by several members of the Society, the hearth and ground level of part of the furnace were traced, and several useful pieces of the structure found. In particular, marl bricks used in the structure of the stack, and showing the effects of the working temperature, assisted in developing the reconstruction of that part of the furnace. In addition an interesting portion of the junction of the sandstone blocks of the bosh and the marl bricks of the stack

[24] **Anglesey Papers, D 1734/3/3/211-15, W.S.L.**

[26] **Johnson, P>. L. C, The Iron Industry of Cheshire and North Staffordshire, 1688-1712, *Trans. North Staffs. Field Club,* 1953-4, pp. 32-55.**

[28] **Schubert, H. R., op. cit., p. 306.**

confirmed the angle of the bosh previously found at the Cannock site, it should be possible to obtain from this site, a section through the hearth of the actual furnace.

Whereas the pattern described covers the iron-making works of the Paget era, it apparently does not entirely cover the complete ironworks of the Cannock Chase district, and an examination of all the water-wheels shown on Yates' map of Staffordshire would certainly reveal more, e.g. the region of Wedges Mills, the forge at Congreve on the Penk, Hints Forge, and Weeford Slitting Mill.

ACKNOWLEDGEMENTS

The writer expresses his gratitude to the Most Honourable the Marquis of Anglesey for allowing the publication of the text of certain of his manuscripts now deposited at the William Salt Library. Acknowledgements are also due to Capt. A. Foley, to whom the Foley records belong, and to the Hereford County Records Office in whose custody they are; to the owners of the various sites for permitting excavation and examination to take place; to Mr. J. Gould for the assistance he has given, in particular with the Foley records, and, with other members of the Society, in the excavation at Teddesley furnace; also to other friends for the work at Cannock. Thanks are also due to Mr. F. B. Stitt of the William Salt Library and his staff, who made available the Anglesey documents and gave considerable assistance with these records, and to the Department of Economic History of Nottingham University for permission to use the information in Miss Anderson's dissertation.

APPENDIX I

INVENTORY OF CANNOCK FURNACE AND FORGE - 1570/1

At the furneyes

Cordes of woode 842	at *5d.* a piece.	£15 lis. *O^d.*
Cooles 4 score loade a 4/-a lod	£16	
WALSALL Stone 300 at 6s. the lo'.	£90	
Stone at WALSALL in the waste 439 lo'at 3**A**. the lo'	£65	*lis.*
Stone in Mr Luson's Lezve 17 lo' at *3s. 6d.* the lo'		*59s. 6d.*
Stone in Raufeson's Lezve 26 lo' at *3s.* the lo'		*78s.*
Stone lent in other places, 5 lo' at 3s. the loo'		15s.
Sowes of iron 29, 14£ to at 66s. *8d.* the tonn.	£48	6s. *8d.*
Sowes lent to Mr. Poiniters 9 tons 4^ cwt.	£30	15s.
Hammers lent hym 2		33s. *Ad.*
Sowes by the way in Carr's hands at COLTON, 11 tons at 66s. *8d.*	£36	13s. *Ad.*
sum £312 8s. *Q\d.*		

At the forge:

Cooles 160 loads at 5s. *Id.*	£41	6s. *8d.*
Sowe colshewe.		33s. *Ad.*
Sowes tough 111 cont' 55^ tons at 66s. *8d.*	£185	
Piggs 18 [containing] 4| tons at 66s. *8d.*	£15	
Hammers 21 "1		
Endviles 17 *V 8* tons at 66s. *8d.*	£26	13s. *Ad.*
Plats 5 J		
Broken iron 1 tunn		66s. *8d.*
Cordes of wood 559 at *Id.*	£ 17	1 *Ad.*
Trees cropped uncute 600		66s. *8d.*
Hammered iron 26 tons *5*\ cwt. and 22 **lb.** at *0d.*	£262	17s.
sold as apperyth before for	£272	7s.
£293 7s. *0d.*		

Anglesey Papers, D1734/3/3/222, William Salt Library, Stafford.

APPENDIX II

Among the Foley papers in the Hereford Central Library is a letter addressed to Paul Foley Esq., Member of Parliament at his Chambers in the Inner Temple London. It reads as follows:

Haywood Oct. 14th 1691

Hono^rd Sir

I reed a letter last post from yo^r son with an inclosed calculation of the produce of a Furnace and a Forge in ye Forest of Dean. I am sorry 1 came so late home last Saturday night as I saw it & was forced to come from home so early this morning for ye Moorlands yt I can onely now on ye road and send yo my short observation of it wch 1 though best to signify by another calculation like to that in form but nearer the truth for thay yo^r son is very extravagant in many pticulars & ye yeild of coles and charges of mine & cinders with other disbursm^ts are by now as easy sett down as we do bona fides give for most if not all ye pticulars If yo^r pleased to command me further herein I will be more large in demonstrating of every asso^tion for yo^r or any others satisfaction but at p'sent can only add that I am

Sir

Yo^r most humble servant

John Wheeler

6 long cords of wood will not make above 2 loads 2 sacks and a half of Coles generally wth 2 lo 2\ sac of Coles will not make above one Ton of sow iron generally

		£	*.	d.
Charge to make a ton of Sow Iron att a Furnace	Cutting and Cording ye sd 6 long cords generally . .		1	1 0
	Coleing at 3/6 and carriage to furnace at 4*. per load generally		1	6 8
	Mine *5s.* Cinders 8*. at least brough to furnace . .		13	0
	Founder 3*. *Ad.* Carriage to Severn 4*. per ton . .		7	4
			2 18	0

which ton of Sow Iron will not yield above £6 per ton at Severn Bank payable 3 or 6 months after sale,

a Furnace may blow 40 weeks, the first 6 weeks whereof may cast 90 tons and ye rest 20 tons per week which will amount to 770 tons at £6 per ton amounts to.	**4620**	**0**	**0**
Charges deducted at £2 18*. per ton as above is	**2233**	**0**	**0**
Rest clear.	**2387**	**0**	**0**
Other charges to be allowed and deducted out of ye profits			
To build a Furnace & all appurtenances and to stock it will require at least £4000 ye int. whereof is paid.	**200**	**0**	**0**
To a Chief Manager, Wood Clerks & other clerk and Stocktaker . .	**100**	**0**	**0**
To Colecarts and hurdles and travelling expenses at least	**30**	**0**	**0**
For hearthstones and carriage, making hearth timber Carpenters masons Hydes Grease and Oyle, making and dressing bellows Mine Cinders and cole-baskets Iron for tools Smith work Barrows ladders riddles labourers and a multitude of individual charges	**150**	**0**	**0**
	480	**0**	**0**
So the produce of a Furnace deducting charges is	**1907**	**0**	**0**
But then ye 6 long cords for each ton is to be reckoned with if charged at 7s. *6d.* the long cord is 45s. per ton and amounts to	**1732**	**0**	**0**
So will rest clear	**175**	**0**	**0**

If the wood should be reckoned at more than 7*. ***6d.*** ye long cord uncutt the produce will then be so much the less

1 charge nothing in lieu of bad debts nor disasters and damage wth by hazard of fires flouds & neglect or unskilfulness of founders & workmen a Furnace is lyable to & doth frequently happen at lit

The charges to a Forge is at least £200 per [sic] and more than is granted in the note and yet the iron will not now yield £15 per ton when caryed to Bristoll

With this letter was a separate sheet showing the original estimate. It is headed:

What advantage will yearly accrue to his Ma"ᵉ by a Furnace and a Forge

Impris 4 long cord of wood will make 2 load of coles wch
2 load of coales will make one Tun of Sowe Iron

Charges to make a Tun o f Sow Iron	Cutting & cording 4 long cord generally			14*. ***Od.***
	coaleing at 3*. ***6d.*** per load			7 0
	carriage to ye Furnace generally			7 0
	Myne o r oar			5 0
	Cynders			3 0
	Founder o r Caster			2 0

wch Tun of Sowe Iron will yield [...?...] £6 10*.

Furnace will cast 26 tun per week wch at 48 weeks will amount to 1248 tunn per ann wch at £6 10*. per tun is £8112 but charges deducted at 3*. ***8d.*** per tun amounts to £2402 8*. remains clear £5709 12*.

Other charges to be allowed & deducted out of ye proffits of the Furnace

To a Stock Take per ann	16	0	0
To a Clark per ann	40	0	0
To ye Carpenter per ann	6	13	4
Rprs of the Furnace	12	0	0
Travelling charges of ye Clerk to sell Iron	5	0	0
To wood clerks per ann	20	0	0
And for sacks and hurdles	20	0	0

The forge will make 150 tun wch will yield generally £16 10*. per tunn

Charges to make a Tun of Bar Iron

Three load of cole will make a Tunn of Barr Iron whereof one may be braises but set it at three loads the cutting cording and carriage whereof will amt to				2 2 0
and 2650 [lb. ?] weight of sow iron will make on Tun of Barr Iron wch said 2650 weight of Sow Iron at £6 10*. per Tun amounts to				8 12 0
Fyners and Hammermen				10 0
				11 14 0

	£	*.	d.
Produce of 150 Tuns at £16 10*. per tun is	2475	0	0
Charges at £11 14*. per tun is	1740	0	0
Remainder clear	735	0	0
To a Clark per ann 25 0 0			
Stock Taker 16 0 0			
Carpenter 6 13 4			
For other repairs and oyle etc 20 0 0	67	13	4
Total o f the Furnace deducting officers fees	5609	18	8
o f the Forge deducting officers fees	667	6	8
	6277	5	4

LICHFIELD RACES

ANN J. KETTLE, M.A.

LICHFIELD RACES, which in the eighteenth century were one of the most popular of the Midland race-meetings, were started soon after the Restoration. Held on Fradley Heath, they were supported by the corporation of the city which awarded a cup or tankard, known as the City Plate[1]. In September 1682 the races coincided with the visit of the Duke of Monmouth to Lichfield on his progress through the Midlands; the gentlemen attending the races showed their lack of enthusiasm for the Duke by refusing to delay their dinner at The Swan until he arrived[2]. But in 1685 there was no race-meeting 'by reason of Rebellion in the West'; however, the following year there were two days racing as usual, the Subscribers' Plate on Tuesday, 24 August and the City Plate on the following Friday, with hunting in Needwood Forest afterwards[3].

In 1702 the meeting was transferred to Whittington Heath where it was to continue without interruption until the end of the nineteenth century. With the move the official connection with the city corporation seems to have ceased as the City Plate was no longer offered[1]. There were several other race-meetings in Staffordshire at the beginning of the eighteenth century - at Penkridge, Newcastle, Eccleshall, Tamworth, Burton, Stafford and Stone - but none of these achieved the popularity of the Lichfield meeting[4]. In 1737 it was reported that there was good sport each day and a very fine appearance of 'noblemen, gentlemen and ladies'[5]. By the early 1740s two days racing were held regularly in the first week in September, and in 1743 some of the 233 gentlemen who dined at The Swan after the races decided to organize a third day's sport for the following year by subscribing to a plate for 5-year old horses. This became a regular event[6]. The popularity of the meeting can be judged by the distinguished names of the winning owners in 1746, Sir Watkins Williams Wynne, Lord Gower and Lord Trentham[7].

In 1747 the meeting became involved in party politics. At the parliamentary election in the spring before the meeting the Tory members for Lichfield had been unseated by the two Whig candidates. The Whigs decided to turn the races into a triumphal parade and the Duke of Bedford, the leader of the party, was invited to Lichfield for the occasion. On the second day of the meeting there were riots on the course and the Duke was assaulted. One account says that he 'received a horse-whipping from a country farmer' and another that the leader of the rioters was 'one Joul, a dancing master'[8]. A strange postscript to the incident was the report

[1] **A. D. Parker, *Lichfield,* 1925, pp. 72, 74.**
[2] **W.S.L. (William Salt Library) 370/viii/I, f.223.**
[3] **Ibid., ff. 275-6.**
[4] **For details see the forthcoming article on 'Horse-racing' in *V.C.H. Staffs.,* ii.**
[5] **W.S.L., 370/viii/III, f.1020.**
[6] **Ibid., f.1159; Parker, *Lichfield,* p. 72.**
[7] ***Aris's Birmingham Gazette,* 8 Sept. 1746.**
[8] ***S.H.C.,* 1920 & 1922, p. 253. There is in the William Salt Library a cartoon illustrating this incident called 'A Sight of the Banging Bout at Lichfield'; the cartoon was sold with a pamphlet telling the story of the election and the races in doggerel verse, of which there is also a copy in the Library.**

A Compleat LIST of the HORSES,

Entered to Run upon Whittington-Heath near the City of

LICHFIELD,

On Tuesday, Wednesday and Thursday, the 1st. 2d. and 14th.

Of SEPTEMBER, MDCCLII.

On TUESDAY, the *1st.* of *September*, for his Majesty's Plate of *One Hundred Guineas* by Five Years Old Horses *&c.* carrying Ten Stone weight, the best of three two Miles Heats.

	Riders Names.	*Colours.*	1h	2h	3h
EARL *Gower's* Bay Mare Louisa, — — —	*James Larkin,*	Red.	2.	4.	4.
Lord *Strange's* Bay Horse Sportsman, — —	*Rich. Osbaldiston,*	Buff.	3.	5.	*dis*
The Hon. *John Bavry* Esq: Grey Horse Small Hopes,	*Mich. Jones,*	Blue.	4.	3.	3.
Mr. *Warren's* Brown Mare Quiet, — —	*J. Woodcock,*	Blue.	5.	dr	
Mr. *Rich. Williams's* Bay Horse Cricket,	*Tho. Maddison,*	Green.	1.	6.	2.
Mr. *Benj. Dixon's* Grey Mare Phillis, (to be Sold)	*Ab. Aldridge,*	Striped.	8.	*dis*	
Mr. *Hunt's* Brown Horse Spanker, — —	*John Sands*	Check.	6.	1.	1.
Mr. *Salt's* Chesnut Horse Hercules, — —	*Ed. Dilly,*	Blue.	7.	2.	5.

On WEDNESDAY, the 2d. of *September* for a Purse of *Fifty Guineas* by Four Years old Horses *&c.* carrying Nine Stone weght, the best of Three Two Miles Heats.

Earl *Gower's* Grey Colt, — —	*Jam. Larkin,*	Blue.	1.	1.
Mr. *Henry Adderton's* Brown Horse Forrester, (to be Sold)	Rider Unknown		3.	*dis*
Mr. *John Goodwin's* Black Mare Small Chance,	*Matthew Pratt.*	Blue.	2.	2.

On THURSDAY the 14th. of *September* for a Purse of *Fifty Guineas*, by Six Years old and aged Horses *&c.* the Six Years old to carry Nine, and the Aged Ten Stone: the best of Three Four Mile Heats.

Sir *Rich. Wrettesly's* Bay Horse Jubilee Dicky, Aged,	*Jam. Larkin,*	Red.	1.	2.	2.
Capt. *Becher's* Chesnut Gelding Sky-Rocket, Aged,	*Will. Gunly.*	Yellow.	*dis*		
Capt. *Vernon's* Brown Horse Surley, Aged,	*Rich. Osbell,*	Yellow.	2.	1.	1.

LICHFIELD: CLOSE: Printed in the Year 1752.

Fig. 1 Handbill for Lichfield races.

(The days were consecutive; due to change of calendar, eleven days were lost)

in a London Whig newspaper a few months later that two highwaymen had been captured in Sherwood Forest; one was an Irishman, the other a Frenchman - they had both been at Falkirk with the Young Pretender but had deserted and were said to have been the ringleaders of the riots at Lichfield races[9]. The official end to the incident was in August 1748 at Stafford Assizes, when thirteen men were found guilty of 'insulting the Duke of Bedford and other gentlemen upon Whittington Heath'[10].

The Tory supporters of the races were not prepared to see them taken over by the Whigs. In August 1747 the gentlemen 'who used to attend Lichfield races in support of the country interest' were invited to a meeting at Lichfield on 23 September 'to concert proper measures to establish the future races there'.[11] This meeting was turned into a Jacobite demonstration attended by mobs from Burton and Birmingham, drinking the health of the Pretender and singing treasonable songs. The main object of the meeting was to draw up a petition against the Whig M.P.s, but it was also decided to start up a rival race-meeting[12].

Separate Whig and Tory races were held at Lichfield for the next six years and were the occasion of much rivalry between the gentlemen of the county, each party trying to outshine the other in the number and quality of those attending the races and the splendour of the sport and other entertainment. The first Tory races were held on 30 and 31 August 1748 when 'the town was so crowded that great numbers were obliged to retire to Tamworth for beds and stables', and the race dinner had to be held in a garden 'there being no house capable of receiving such company'; during this meeting there was a 'board of the Loyal Brotherhood, where 15 brethren attended'[13]. Meanwhile the Whigs had thought up a fine trump card. In May they obtained from the King the coveted right to offer a Royal Plate of 100 guineas at their meeting which took place a week after the Tory meeting; this Plate was to secure Lichfield's place as one of the leading provincial meetings during the eighteenth century[14]. At the Whig meeting there was present 'a great number of nobility and gentry and at the Balls a most brilliant appearance of ladies'[15]. A handbill showing the horses entered for the Whig races in 1752 is illustrated at pi. I[16]. These races were run on consecutive days but because of the loss of eleven days when the calendar was changed in September 1752, the dates are shown as 1, 2 and 14 September.

The rival races continued for the next five years and the names of those attending the meetings provide a useful guide to the political affinities of the county families; the Watkins Williams Wynnes, the Gresleys, the Sneyds and the Littletons prominent among the Tory sportsmen, and the Ancasters, the Gowers and the Warrens among the Whigs. By 1753 party bitterness was beginning to fade - some owners had been entering their horses for both races[17] - and in 1754 only one meeting was held in the first week of September. The episode of the double races was soon forgotten, but in 1770 reference was made to it obliquely in a newspaper report of that year's races:

> We have received intelligence from Lichfield that notwithstanding the star of dissention has not been seen in the county of Stafford for some time past and the freeholders have returned to their good manners, we cannot help remarking that an inauspicious omen appeared at the races, viz. on Wednesday 45 ladies dined at the ordinary and Junius won the Plate[18]

[9] **W.S.L., 370/viii/lV, f. 75.**
[10] ***Aris's Birm. Gaz.*, 22 Aug. 1748.**
[11] **Ibid., 7 Sept. 1747.**
[12] ***S.H.C.*, 1920 & 1922, pp. 253-4.**
[13] ***Aris's Birm. Gaz.*, 5 Sept. 1748.**
[15] **W.S.L., 370/viii/IV, f. 86.**
[14] ***Aris's Birm. Gaz.*, 12 Sept. 1748.**
[16] **W.S.L., Broadsheets, Entertainment: Sport.**
[17] **Ibid., 10 Sept. 1750.**
[18] **Ibid., 1 Oct. 1770.**

By the 1750s the Lichfield meeting was the only race-meeting left in Staffordshire and it remained popular and well attended for the next fifty years or more and 'productive of much good harmony within the city of Lichfield and the county at large'[19]. A series of printed accounts for the years 1768-86 give us a unique insight into the organization and financing of a provincial race meeting[20]. The accounts were published because there had been rumours that George Hand, a Lichfield lawyer and clerk of the course from 1768, had been making a profit out of running the races. Hand had full control under the two elected stewards of the subscriptions and entry fees for the races, and was in charge of all the arrangements for the meeting, such as advertising and printing, preparing the course and organizing the balls and other social events. In 1773 a grandstand was erected on the course and a separate account was opened for payments for tickets to the stand and for tickets for the balls and assemblies, this account was handed over to Morgan, a bookseller in Market Street[21].

The accounts show that between 1768 and 1773 the total income from subscriptions and entrance money varied between £230 and £270 and the total expenditure was usually a few pounds more - the deficiency supposedly being met by the stewards of the year, but usually by Hand himself. In 1769 the race account was put into serious debt by the stewards bringing down a 'Band of Musick' from London at the cost of 60 guineas. As Hand said:

> This had no relation whatsoever to the business of the races and was an entire new introduction, however, as I was then paymaster general, I complied with their orders and got an abatement in the charge made by the performers of 20 gns.[22]

1769 was the year when Eclipse, the greatest race-horse of the century, won the King's Plate; to General William Dyott, recalling the race seventy years later, this was 'the great event of an old man's memory'.[23]

After 1773 the stand was so successful that it was decided to establish a new race to be run for a cup paid for from the profits of the stand. In 1781 the number of subscriptions fell sharply and, 'horse-racing apparently being much on the decline', it was decided to withdraw the cup and have only two days racing. This brought immediate protests from the inhabitants of Lichfield who started a subscription among the shopkeepers and innkeepers of the city. The office of clerk of the course was not a profitable one: between 1768 and 1786 Hand built up an accumulated deficit of over £270. The stand and assembly accounts were healthier, with a balance in hand of over £300 in 1789.

These accounts and reports of the meetings in ***Aris's Birmingham Gazette*** throw light on another aspect of the race-meeting apart from the actual racing. The meeting was a great social event, with public breakfasts, dinners and ordinaries for the gentlemen, and balls in the evenings for the ladies. There were concerts in the town hall and the vicars' hall in the close, and performances by companies of actors. In 1795 it was reported that,

> the ball on the second night was very splendid, and the comic power of Munden, Bowden and Rees filled the benches of the theatre.[24]

On the race-course itself there were all sorts of additional excitements, liquor stalls and other booths, stray dogs being destroyed on the spot, and the 'light-fingered gentry', many of whom

[19] **Draft letter of 6 Aug. 1787 on back of handbill in W.S.L., Salt MS. 341.**
[20] **There is a copy in the S.R.O. (Staffordshire County Record Office), D.593/Lichfield Agency/4/3 (provisional reference).**
[21] **Morgan's MS accounts for 1784-6 are in S.R.O., D.593/Lichfleld Agency/4/3 (provisional reference).**
[22] **Draft letter in the W.S.L., Salt MS. 341.**
[23] ***Aris's Birm. Gaz.,* 25 Sept. 1769; *Dyott's Diary, 1781-1785,* ed. R. W. Jeffrey, ii, pp. 323^1.**
[24] ***Aris's Birm. Gaz.,* 14 Sept. 1795.**

were in evidence. There was cock-fighting at every race-meeting, many of the horse-owning gentlemen brought along their strings of cocks as well. In 1748 there was advertised a match of cocks between the gentlemen of Warwickshire and Staffordshire for 2 guineas a battle and 10 guineas the main[25]. There may also have been greyhound racing; the Earl of Donegal lost his black and white greyhound on the course in 176 0[26]. Frequently private horse-matches were run over the course for large sums of money; in 1762 there was a match for 200 guineas between a horse of the Earl of Stamford and a mare of Mr. Piggot[27]. There were also foot-races; in 1792 a race was run on the course

> by a private in the Oxford Blues for 400 gns. against time; time allowed four minutes and three quarters to run half a mile and return.

He lost by 17 seconds[28]. There were also less reputable ways of losing money, for in 1778 the mysterious and

> long-prohibited E.O. game was introduced, but the owners of the table were somewhat disconcerted in having their promised harvest rather unkindly blighted by the rigid integrity of one of the city magistrates, who caused the table to be seized.[29]

The eighteenth century saw the heyday of the meeting. In the last quarter of the century meetings were started up again in other parts of the county and from the beginning of the nineteenth century the Lichfield meeting became somewhat less popular and fashionable. Its decline can be traced in the diaries of General William Dyott who lived at Freeford and had been a regular subscriber to the races from the 1770s. In 1793, he went to the races again after an interval of nine years and found the balls thinly attended but a wonderful crowd on the ground[30]. But in 1803, there was 'very little turf sport and very little company'; in 1810 the races were 'tolerably well attended, but nothing like what they were formerly'[31]. In 1811 Dyott was a steward and commented:

> what a change in the appearance of the Heath with respect to carriages, compared with the races five-and-twenty years ago, when there were generally ten coaches and six, and a dozen coaches and four, now the only set of horses was Lord Stafford's, and three or four coaches and four.[32]

In 1816 the attendance was not one-fifth that of thirty years before[33]. In 1822 it was decided to have only two days racing in future, but in 1823 the change did not occasion any symptoms of renewal of either sport or company'.[34]. In 1825 Dyott commented on the lack of the aristocracy for which the races were formerly so noted; the reason for the decline of the meeting seems to have been its failure both to retain the support of the aristocracy and to attract what Dyott called the 'pedestrian populace'[35]. Both classes of race-goer seemed to prefer the meeting at Wolverhampton which was begun at this time and which was to take Lichfield's place as the leading Midland meeting.

Several attempts were made to revive the meeting. In 1831 spring races were introduced which met with Dyott's disapproval because

> Lord Wilton did not add much to the noble ranks by exhibiting himself on two occasions as a jockey in two races with the commonest members of the stable.[38]

[25] **Ibid., 15 Aug. 1748.**
[26] **Ibid., 8 Sept. 1760.**
[27] **Ibid., 13 Sept. 1762.**
[28] **Ibid., 17 Sept. 1792.**
[29] **Ibid., 14 Sept. 1778. (E.O. stands for Evens or Odds).**
[30] ***Dyott's Diary,* i, p. 73.**
[31] **Ibid., i, pp. 237, 295.**
[32] **Ibid., i, pp. 297-8.**
[33] **Ibid., i, p. 315.**
[34] **Ibid., i, p. 351.**
[35] **Ibid., i, p. 370; ii, p. 6.**
[36] **Ibid., ii, p. 106.**

In 1836 Dyott reported laconically,

> Lichfield March races: a complete failure, a parcel of hacks, and a hurdle race, a new fashioned sport much in vogue with the fox-hunters; a wretched affair over old Whittington.[37]

In 1842 Dyott thought he had seen the last meeting and his opinion was echoed by the ***Staffordshire Advertiser:***

> What shall we say of the balcony of the Grand Stand, and the worthy horsemen, the 'yeomenry' of the county, who used in former days to swell their double ranks from the betting-post hill to the winning chair. A solitary half dozen ladies, it is true, were found upon the Monday to grace that, which has boasted of having under its canopy a brighter aristocracy than perhaps any other in the kingdom ... if it had not been for the great exertions of an excellent secretary, the light of other days would indeed have faded and the Queen's Plate no doubt have been taken in one of 'Hansomes' patent cabs, either to the Staffordshire Moors or Burntwood Heath.[38]

The meeting managed, however, to survive for another fifty years, but it did not regain much of its former popularity. In the 1890s the Whittington Barracks were erected on the Heath and the army authorities decided that it was undesirable to hold a race-meeting at the gate of the barracks and the last Lichfield race-meeting took place in the spring of 1895[39].

[37] ***Dyott's Diary,*** **ii, p. 228.**
[38] ***Staffs. Advertiser,*** **24 Sept. 1842. There were successful meetings at the time at Leek and Burntwood.**
[39] ***Staffs. Advertiser,*** **28 Sept. 1895.**

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OBITUARY

We regret to record the deaths of Mr. B. W. Hunt, Honorary Auditor and Mr. S. A. Jeavons, first President of the Society.

PROGRAMME 1964-65

1964

May 2 Day excursion to Cropthorne, Pershore Abbey, Little Comberton (Nash's Farm), Elmley Castle, Beckford, Overbury, Bredon (tithe barn) and Defford (cruck house). Leader: J. Gould, F.S.A.

June 27 Whittington, Croxall, Clifton Campville, Seckington, Appleby Magna (The Moat House), Staunton Harold and Melbourne Church. Leader: J. W. Whiston.

Oct. 2 Annual General Meeting.
Churchwarden accounts of Lichfield - Miss M. Anderson.
Lower Farm, Bloxwich - V. F. Penn.
Roman nails from Inchtuthill - M. M. Hallett.

Oct. 16 Civic Evening at King's Hill School, Lichfield.
Aerial photography - J. Pickering.
Saxon Palaces at Cheddar - Philip Rahtz, F.S.A.

Nov. 6 Prehistoric Staffordshire - A. Gunston.

Dec. 4 Excavations in advance of road construction at Wall - J. Gould, F.S.A.

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Jan. 8 The Forest of Arden - A study of the changing landscape 1086 to 1350 — B. O. Roberts.

Jan. 22 Travel Evening at St. Michael's Hall, Lichfield.
Sailing round the Black Sea - Dr. J. G. L. Cole.
Corsica - A. A. Round.

Feb. 5 The Reconstruction of an Industry. The Paget Ironworks Cannock Chase 1561 - Geo. R. Morton.

Feb. 19 Travel Evening at St. Michael's Hall, Lichfield.
Czecho-Slovakia - M. M. Hallett.
The China we knew - Rev. J. H. Pratt.
Chinese Embroidery - Mrs. Pratt.

Mar. 5 Business History - Mrs. B. M. D. Smith.

All meetings held in the Public Library, Lichfield, unless otherwise stated.

EXCHANGE OF TRANSACTIONS

Transactions are now exchanged with the following Societies, they are deposited in the Reference Section of the Lichfield Public Library, where they may be consulted by members.

Derbyshire Archaeological Society

Leicestershire Archaeological and Historical Society

North Staffordshire Journal of Field Studies

Shropshire Archaeological Society

Woolhope [Herefordshire] Naturalists' Field Club