TRANSACTIONS of the WOOLHOPE NATURALISTS' FIELD CLUB

HEREFORDSHIRE



"HOPE EVER"

ESTABLISHED 1851 VOLUME XLIX 1998 part II

"HOPE ON"

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SPRING MEETINGS

FIRST MEETING: 10 January: Mrs. B. Harding, president, in the chair.

Dr. Mrs. A. D. Brian gave an illustrated talk on 'The Bumble-bee.' She explained that in Britain there are sixty different species which fall into three groups: solitary, honeybee and bumble-bee. They are dependent upon flowers for all their food which consists of pollen and nectar i.e. protein and carbohydrate. Their body structure is designed to fit the flowers on which they feed. The pollen is collected on their body hairs and their tongues take the nectar into their stomachs. Bees have compound eyes and go for colour, they can see ultra-violet but not red: their antennae are used for scent and they have a good sense of direction.

Solitary bees of which there are some fifty types live in colonies in a small nest in the ground or in a wall. The leaf cutter is one. The female lives only a few weeks.

Honey-bees are not native to Britain but live in large colonies with a queen which may live for many years and have thousands of workers during the summer.

The bumble-bee of which there are some twenty species live in colonies which only last one year and are found in disused nests of mice in rough ground, odd corners of gardens and under hedgerows. From egg to adult takes about three weeks. They hatch at different sizes, the small ones remain in the nest as guides whilst the larger ones forage. The males leave the nest and never return but the queens hibernate usually in a sheltered north-facing bank. They need a continuous supply of pollen and nectar as they have little storage space in their nests. The length of their tongues dictates the flowers visited. They are the best pollinators and old-fashioned varieties and single flowers are best suited for them.

The red-shanked bumble-bee is now rare in Herefordshire and Dr. Brian is seeking information as to its whereabouts. It can be identified by its black body with red hairs on its hind part and back legs. It nests on the ground and is often seen on white dead nettle.

SECOND MEETING: 7 February: Mrs. B. Harding, president, in the chair.

Mr. John van Laun, M.Sc., F.S.A. gave an illustrated talk on 'Quarry Railways along the Heads of the Valley Road.' He explained that the quarries along the heads of the valley road, Hirwaun to Clydach, were situated on the dip of the northern limestone outcrop of the S. Wales coalfield. The towns developed along the road where the rivers cut through the valleys southward.

The limestone needed in the ironworks was a long way away and had to be brought to the surface and a railway system was necessary.

In the first instance there were wooden rails followed as early as 1603 in Nottingham by flanged wheels placed on wooden rails. This system spread southwards and was used at

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Bringewood and Charlcote by 1783. At this time canals were also being built and the Canal Acts allowed the tramroads to link with the quarries. The Brecknock to Abergavenny railway of 1792 allowed anyone to use it on payment of the correct tolls. Wooden sleepers were replaced by stone blocks. John Keir claimed to have used plates underground in 1797. Benjamin Outram used L-shaped plates on the Grosmont railway and at Morlais West. The early railways had a 2 ft. gauge which developed to 4 ft. 8½ ins. by 1875 using a combined rail and plateway. James Watt and Richard Trevithick introduced the locomotive. Did this idea originate from Knight in Shropshire or from the iron railway in Scotland?

The bridge of 1811 at Abernant is the second oldest iron bridge and the one over the Bach Brook at Kington is early and very important.

Mr. van Laun illustrated his talk by slides which showed the relics of a past age and the type of housing such as The Triangle at Merthyr where the quarrymen lived in courts.

THIRD MEETING: 28 February: Mrs. B. Harding, president, in the chair.

Mrs. V. Goodbury, Dip. I.A., gave an illustrated talk on 'Lime-kilns and Limeburning.' She said that limestone was burnt to provide quicklime which had many uses, such as lime mortar and lime-wash for buildings. it was also used in glass making, paper making, gas street lighting, salmon poaching and particularly in agriculture.

There are two types of kilns, intermittent and continuous, and can be built or dug out of the ground. A 'lime-pit' can mean a 'kiln.' There are about fifty medieval lime-kilns in the country.

Each kiln had its draw-hole or draw-eye as it was sometimes known and on Merbach Hill in Dorstone parish there is a kiln with this in the back. The single draw-arch was the norm, but in Herefordshire kilns with two were common. Some had a vaulted drawarch and in some there was a niche in the wall where it is thought the lunch was kept. Among the oddities were those in Fishpool Valley, Croft, and Furnace Wood, Walford, which have three entrances all linked.

A distribution map of kiln sites in Herefordshire shows them of most importance around the edge of Woolhope and Fownhope. Unfortunately, they are not always shown on the tithe maps. In the late 17th century there were a large number on the Stoke Edith estate as well as a 17th-century one on Mowbach Farm, Peterchurch. Lime-burning died out in the 18th century when machinery was introduced. Kilns were still in use at Fine Street, Peterchurch in 1836, at St. Margaret's in 1848, on the Doward until 1939 and at Nash Rocks until the 1950s. In the north of the county there are three kilns on the Downton estate and three on Mocktree Hill.

Despite requesting, English Heritage has not listed any Herefordshire sites.

SPRING ANNUAL MEETING: 28 March: Mrs. B. Harding, president, in the chair.

The assistant-secretary reported that the club had 765 members.

Mrs. Harding reviewed the club's activities during the year and said that the Open Day held in the Woolhope Room on 24 June was well attended. She gave her address 'Tufa Formation Today and in the Past.'

Mr. C. E. Attfield was installed as president for 1998/99.

FIELD MEETINGS

FIRST MEETING: 9 May: ASHLEWORTH, GLOUCESTERSHIRE

Members travelled via Ledbury to Ashleworth Manor which was visited by the kind permission of Dr. and Mrs. Barnes. Dr. Barnes in his brief history of the house said that the fine, timber-framed house was built about 1460 as the summer residence for Abbot Walter Newbury of St. Augustine's, Bristol. It consists of a hall and two cross-wings with a two-storied porch. The N. wing was added in 1833 and extended about 1904. Inside were seen moulded beams and joists and a Tudor chimney-piece. In 1542 it became the vicarage. After a guided tour of the house members had tea in the garden.

Next visited was the tithe barn which was built between 1481 and 1515 by Abbot Newland of St. Augustine's, Bristol. It is 125 ft. long and 25 ft. wide, of ten bays with queen-post trusses, limestone walls, stone slate roof, diagonal buttresses and two gabled transepts. It is understood that a large restoration is planned.

Also visited was Ashleworth Church which dates from the 11th to the 15th centuries. Remains of Saxon herring-bone masonry can be seen in the N. wall. The chancel and chancel arch are 13th century, the S. aisle and chapel are 15th century, the E. window is 15th century with 19th-century glass and the N. transept is 19th century. The tower dates from the 14th and 15th centuries and has six bells of 1687 cast at the Rudhall foundry in Gloucester.

Opposite the church is Ashleworth Court built about 1460 of limestone, but it was not possible to visit it.

Members walked down to the quay on the Severn where stands the early 19th-century Boat Inn. Evidence of the recent floods was seen.

SECOND MEETING: 21 May: WOMBOURNE AND WOLVERHAMPTON AREA

The party stopped for coffee at the Whittington Inn near Kinver and saw the restoration work there since last visited by the club in 1995. The timber-framing is now in its natural state and the panels have been yellow lime-washed.

The morning was spent at the Wodehouse at Wombourne by the kind permission of Mr. and Mrs. J. W. Phillips. Mr. Phillips explained the history of the house and the estate and then in two groups members were given a guided tour of the house. The late medieval hall dating from some time after 1350 has been much added to and altered in each century e.g. the hall ceiling is c.1680. In 1872-3 G. F. Bodley remodelled the S. and W. fronts and added the S. porch. In 1895-7 C. R. Ashbee added a chapel and a billiard room over the kitchen. In 1912 J. and H. E. Lavender of Wolverhampton added a service wing. The

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brick stables are Georgian and 19th century. Members were able to enjoy the grounds and kitchen garden. The landscaping of the eighteen-acre garden dates from the 18th century and is noted for its rhododendrons.

After a picnic lunch the party travelled to Graseley Old Hall at Penn Fields, Wolverhampton, situated in the midst of a modern housing estate and a contrast to the previous visit. This was visited by the kind permission of Mr. and Mrs. Williams. Mrs. Williams spoke on the history of the house and then took members on a guided tour of the downstairs rooms. It is situated in a one and half acre garden and is said to be the oldest house in Wolverhampton, dating from the 15th century. Inside were seen fresco paintings on timber-framing and wattle and daub, 12 in. ceiling beams and a very fine fireplace.

On the return journey a stop was made at Kinver to walk up to Holy Austin Rock to see the remains of the cave dwellings which at one time were occupied by eighty people. One house has been renovated.

THIRD MEETING: 20 June: CLUN, BISHOP'S CASTLE AND WALCOT AREA, SHROPSHIRE

After coffee at the Buffalo Inn at Clun many members stayed in the coach due to heavy rain. Some visited the museum whilst others walked to the castle where Dr. Eisel explained that it is owned by the duke of Norfolk but since 1991 has been in the guardianship of English Heritage. All that remains today is the great tower built against the N. side of the motte and two bastion towers. A modern survey suggests that the tower was built at the end of the 13th century or early in the 14th rather than in the 12th century. It has been owned by a number of families including the de Say and fitzAlans. In 1677 the Clun estates were sold. At the end of the 18th century it was owned by Lord Clive and finally bought by the duke of Norfolk in 1894.

After a picnic lunch at Bishop's Castle the weather improved so members walked up to the top of the town and saw the restored Porch House, the Town Hall of c.1765, the House on Crutches, now a museum, the Three Tuns, well known for brewing its own beer and the Castle Hotel of 1719.

The afternoon was spent at Walcot Hall. The rain had ceased and the sun was shining. The house was designed by Sir William Chambers in 1763 for Clive of India. It is two-storied of eleven by eight bays with a portico with four Tuscan columns. The ball-room was added in the early 19th century by his son, Edward, earl of Powis.

The final visit was to Lydbury North Church dedicated to St. Michael. It is a Norman cruciform church with a late Norman W. tower. In the N. transept is the Plowden Chapel and in the S. transept Walcot Chapel with a room over used as a school. Other features include the screen to the N. chapel of c.1500, Jacobean box pews, the pulpit of 1624, the altar candlesticks of c.1640 and the rebuilt S. porch of 1901 by Micklethwaite in the Arts and Crafts style.

FOURTH MEETING: 18 July: ASTLEY ABBOTS AND ATTINGHAM AREA, SHROPSHIRE

This meeting was the president's choice. The first visit was to Astley Abbots where members were welcomed by Mrs. Hodgson to view her landscaped garden which has been laid out since 1953 and also to the four-acre lavender field which yields about one and a half tons of lavender each year. The church is dedicated to St. Calixtus and founded in 1134. There are Norman windows in the N. wall of the nave, a blocked Norman doorway and a Norman font. The chancel was rebuilt in 1633 and has a hammerbeam roof whilst the tower, the S. porch and the S. wall of the nave date from 1837. Opposite the entrance is the Maiden's Garland and gloves of 1707, said to have belonged to Hannah Phillips who was drowned on her wedding day.

The afternoon was spent at Attingham Park which was built 1783-5 by George Steuart for Lord-Berwick. It is constructed of Grinshill stone immediately S. of the earlier house known as Tern Hall incorporating it on the N. side. John Nash in 1807 designed the picture gallery and staircase. The ceiling of the gallery consists of iron beams and glass and iron coving made at Coalbrookdale. The park was laid out by Humphrey Repton in 1797-8. Inside were seen the chamber organ by Samuel Green of 1788, Italian furniture, a collection of pictures and the Regency silver by Storr. The house and estate were left to the National Trust in 1947.

Finally Atcham Church dedicated to the Celtic saint St. Eata was visited. It is built of red sandstone. The N. wall is Saxon using stones from the Roman site of Wroxeter. The rest of the church is mainly 13th century with the timber-framed S. porch of 1685. The 15th-century glass in the E. window was brought from Bacton in Herefordshire in 1811. It is a memorial to Blanche Parry who was lady-in-waiting to Queen Elizabeth I. The removal was due to the fact that the wife of the vicar of Atcham in 1811 was a descendant of the Parry family.

FIFTH MEETING: 15 August: Ullingswick parish

The afternoon was spent in the parish of Ullingswick. The exterior of The Steppes dating from the 18th century but probably containing timber-framing in the cross-wing of 17th-century date was viewed.

On the eastern edge of the parish from a view-point near the Three Crowns the open fields of the late 18th century covering the hamlets of Upper Town and Lower Town were pointed out.

By kind permission of Mr. and Mrs. Dalton Upper Court was visited. It has a stone core dating from the late 16th century and a wing dated 1757 with a panelled room of the early 18th century.

After refreshments at Lower Court the house was viewed by kind permission of Dr. and Mrs. Eisel. It is timber-framed of varying ages. The W. cross-wing shows signs of medieval work, the E. cross-wing is close-studded, probably later, and the central block of the early 17th century. The plaster overmantel and the staircase date from this period.

The final visit was to the church where two Norman windows, the 13th-century nave and 14th-century chancel survive. On the S. wall is a tablet to John Hill of Nether (Lower) Court who died in 1590/1. The church was restored by Kempson in 1863. Here Mrs. Grundy spoke on the 18th and 19th-century development in the parish.

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SIXTH MEETING: 5 September: CHELTENHAM, WINCHCOMBE, WHITTINGTON AND STAUNTON AREAS OF GLOUCESTERSHIRE

The first visit was to the Pittville Pump Room which was built between 1825 and 1830 by John Forbes for Joseph Pitt as the centrepiece of his estate. On the upper floor of what was the library, reading room and billiard room, members viewed the costume collection tracing the history of fashion from 1760 to the present day.

In Winchcombe stone and timber-framed buildings dating from the 16th, 17th and 18th centuries remain unspoilt. The church dedicated to St. Peter dates from c. 1465, an example of Perpendicular architecture. The W. tower with eight pinnacles is ninety ft. high and around the church there are forty grotesque gargoyles. Of particular interest is the former altar cloth assembled during Katherine of Aragon's stay at nearby Sudeley Castle and dating from about 1380-90. The Flemish brass candelabra is dated 1753 and the organ-case dates from c. 1735 and is believed to be the work of Grinling Gibbons. Nothing remains of the Benedictine abbey which stood to the E. of the church.

Whittington Court was visited by kind permission of the owners. It was built in 1556 on an older moated site and is only half its original size. Three steep gables remain with an added early 18th-century cross-wing. Inside were seen fine chimney-pieces, panelling and a Tudor oak staircase from cellar to attics with moulded balusters and carved newels.

The nearby church has Norman origins but was heavily restored in 1863 and 1872. The font is about 1200 and there is a brass of 1556 to the Cotton family.

The final visit was to the Red House at Staunton by the kind permission of Mr. and Mrs. Turner. This brick house was built about 1640. Inside, the walls are timber-framed and the Jacobean staircase from cellar to the attics has mirrored balusters. The garden is being created to encourage wildlife.

AUTUMN MEETINGS

FIRST MEETING: 3 October: Mr. C. E. Attfield, president, in the chair.

Mrs. B. Lewis, B.A., gave an illustrated talk on 'The Parish and Anglo-Saxon Estate of Staunton-on-Arrow.' She said that in Wells Cathedral there is a charter of 958 of the bishop of Hereford's estate. She used this document to trace the estates and boundaries of the parish. It consists of five hides and the soil is very stony due to the Ice Age. The parish boundary runs along the top of Wapley Hill, W. of the Rowe Ditch and E. of Offa's Dyke. She commenced in the S.E. corner of the parish and worked clockwise referring to the medieval settlement at the Noke, the two manors, Lower Court based on the church, and Old Court Farm probably the manor-house and possibly the site of the Anglo-Saxon hall. She continued to the township of Mowley which probably belonged to the monks of Titley (Tiron) and on to Burcher Court where the parish boundary passes through the dining-room. Continuing northwards the boundary lies just below the top of Wapley Hill and then goes southwards to Stansbatch and W. of Milton Cross to the starting point. Having walked all over the parish Mrs. Lewis explained the various features on the ground and related them to the document.

SECOND MEETING: 24 October: Mr. C. E. Attfield, president, in the chair.

This meeting was cancelled due to floods.

THIRD MEETING: 14 November: Mr. C. E. Attfield, president, in the chair.

Mr. R. B. Boddington, B.A., gave an illustrated talk on 'Traditional Apple Conservation.' Firstly, he referred to the Marcher Apple Network which was set up in 1993 to rescue from extinction as many as possible of the old varieties of apples and pears and to stimulate public interest in them. Many of the native orchards have disappeared, become unproductive through neglect or not geared to large-scale production for the manufacture of cider. Mass production and standardisation of a few varieties from overseas have also led to their decline. Each area had its own special varieties and it is hoped to establish some of those which have a long history.

He mentioned recently published books on apples and pears and *The Herefordshire Pomona* of 1880 by the Woolhope Club.

The apple originates from the crab apple which has a very long history for apple rings were found in a tomb in Basra dating from 2,500 B.C. A 10th-century agricultural book in Toledo in Spain mentions apples. The Pilgrim Fathers took apple seed to America. Henry VIII employed Richard Harris to commence orcharding in this country, and the growth of the 18th-century country house led to the experimentation to produce apples for all the year round. T. A. Knight carried out experiments at Elton. There was a decline in the mid-19th century but a revival followed which was boosted by *The Herefordshire Pomona*. In this century the two world wars and the overseas imports have caused a further decline.

Mr. Boddington explained that identification of species is not easy but a start has been made to bring back some of the old varieties. He brought along a display of these.

WINTER ANNUAL MEETING: 5 December: Mr. C. E. Attfield, president, in the chair.

Officers for 1999 were appointed. The accounts for the year ending 31 December 1997 were presented and adopted. These are printed on p. 169.

Mr. P. Thomson, B.Sc., gave an illustrated talk on 'Landscape History of the Woolhope Hills.' He said that the Woolhope Hills were a similar formation to the Ledbury, Wigmore and Wenlock areas. There are two rims of limestone, the outer being the higher with sandstone in the centre. His photographs showed the wide vales between the escarpments and the planation which had gone on planing down the hills. The rocks were formed during the Silurian period some 400 million years ago, folded about 270 million years ago and the planation took place about 60 million years ago. The rocks are fossiliferous containing brachiopods, crinoids and corals. The planation left the hills here and in

Wales in a series of steps or platforms at 600-700, 1400-1500 and 1900-2000 ft. The photographs showed these levels from the Daren and Gilfach and he compared them with areas around Ben Nevis and in the Alps.

He explained about the hard capping, duri-crusts and the sarsens, duri-crusts cemented together by silica.

The watershed in the Woolhope Hills is to the E. side and the streams have cut through the limestone, the Pentaloe Brook to Mordiford and the Sollers Hope Brook to the S.E. The glacial effects on the Woolhope Hills were minimal.

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WOOLHOPE NATURALISTS' FIELD CLUB

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Presidential Address

Tufa Formation Today and in the Past

By BERYL HARDING

Some confusion can exist over the terms tuff, tufa and travertine.

Tuff is a medium-grained volcanic rock formed not from lava but from volcanic ash blown high into the air during an eruption. After descent the subsequently layered and compressed ash has a grain size of not more than 20 mm. diameter and may contain tiny crystals from the magma chamber below the volcano. Being so lightweight it can be blown many miles, even hundreds of miles, before settling and consolidating. In Herefordshire there is a layer, the Townsend Tuff Bed in the Lower Old Red Sandstone,' the product of distant but powerful explosions some 360 million years ago. Tuff is not as light as pumice nor does it contain as many airspaces, nor the ability to float on water but layers of ash and pumice together are also referred to as tuffs.

Tufa, or calc-tufa, is a recent sedimentary deposit of calcium carbonate laid down after the emergence of a spring rich in calcite water. Calc tufa occurs in limestone regions filling joints, fissures and cavities in the rock but mostly around resurgences of water which have flowed through the limestone strata. The tufa deposited below these springs is usually spongy and cellular in character and may enclose and petrify fragments of other rock, plant or animal remains.

Carbon dioxide in the atmosphere is only 0.04% so rainwater contains this minimum plus any further emissions by man or volcanoes then becoming a mild carbonic acid. Once the rainwater has percolated through the soil this ground-water becomes a stronger carbonic acid due to the absorption of additional carbon dioxide produced by the respiratory activity of micro-organisms, invertebrates, vertebrates and underground plant parts. This biogenic activity gives a 13-20-fold enrichment of carbon dioxide compared with air.²

In the absence of carbon dioxide the solubility of calcium carbonate rocks in water is very small but in its presence calcium bicarbonate is formed which has a great solubility. In limestone areas this reaction is marked and leads to a growing network of vertical and horizontal cracks, especially in carboniferous limestone which is already very jointed. This seepage of ground-water finally forms underground streams carving out passages and caverns through ever widening fissures. Such cave systems do not occur in other limestones as they lack the heavy jointing, nor do they occur in chalk owing to the general porosity of that rock.

Once further changes occur such as a decrease in pressure, or an increase in temperature, or evaporation of water, or loss of carbon dioxide then the bicarbonate solution is precipitated out to calcium carbonate again and can form stalactites and stalagmites, or curtains, where the water is dripping in caves, and tufa after the water emerges as a spring. These latter deposits may take the form of curtains, also fans or small barrages of rock

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over which the water flows rapidly. Today tufa deposition in Britain is minimal and mostly confined to lining shallow stream beds or ground-water overflows in limestone areas and, to a lesser extent, in chalk.

Where springs emerge as warm water, as in volcanic regions, a harder form of calctufa is formed called travertine. It is usually pale in colour and being harder and denser is often used by sculptors as a substitute for marble. Such deposits do not occur in Britain, the hot springs at Bath produce another form of calcium carbonate with magnesium called aragonite rather than travertine. This is deposited at a temperature of 43°-47°C.³ The term travertine seems to be increasingly used in Europe for both forms of calcium carbonate deposits but for this study the term tufa or calc-tufa will be used for the softer varieties which often have local names such as frozen-sponge rock or puff-stones. Being a comparatively soft rock it can be destroyed by mechanical and water erosion which can often exceed deposition in places today.

In Herefordshire there are three types of limestone. One is the Carboniferous found to the S. of the county at the northern edge of the Forest of Dean and around the Doward where cave systems also occur. Another is the Silurian limestone forming ridges in the Woolhope Dome and to the W. of the Malverns as well as in the Wigmore Dome near Leinthall Starkes, and thirdly throughout much of the county there are the calcretes, or cornstones, of the Old Red Sandstone. These cornstones were not formed by compression and petrification of dead lime-producing marine organisms beneath the sea but by the upward leaching of soluble calcium carbonate from lower levels. They were deposited after evaporation close to the ground surface on the arid alluvial plains of that period when rainfall was seasonal. In Herefordshire these calcretes usually overlay the mudstones and are found in bands of varying thickness. Where the nodules are sparse and in thin layers they are called cornstones but where larger and in almost continuous bands they are now called Bishop's Frome Limestone.

Tufa can be used for various purposes. The first and most obvious is its extraction and crushing for liming and improving heavy clay soils. In the Field name Survey many areas of tufa are referred to as Hoarstone Fields or Roughs. This reference is found in some fourteen parishes and often referring to several adjacent fields at a time. In the parish of Bodenham along Dinmore Lane is a steep stream flowing out from the cornstone bands of Dinmore Hill still depositing tufa and below which is a field called Hoarstone Rough. (In the Hampton Court records there are tenancy agreements giving the right to quarry this hoarstone for liming purposes.)⁴ Once the stream reaches Hoarstone Rough it has been diverted and channelled in the past to flow around part of the field, probably for drowning and warming the meadow with lime-rich waters in late winter.

Secondly, the honeycomb and irregular appearance of tufa has led to its use in landscaping and construction of rockeries and grottoes especially in the Picturesque period, which can still be seen at Kyre Park, Croome Park and Painshill Gardens near Cobham. In Mediterranean regions, where it is more abundant, it is utilised in many parks and gardens for ornamental stone-work.

Thirdly, tufa has several good building qualities. When first cut it is soft and easily worked but after exposure to the atmosphere it hardens. It is durable yet light in weight so

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is ideal for building the upper levels of churches and towers and is especially useful for roof vaulting and the stonework of upper walls over arches. This can be seen in Bodenham Church and the lofty cathedrals of Wells, Gloucester and Worcester. In Worcester much of the vaulting and upper walls of the W. end nave and transepts are reused tufa blocks from earlier building. These stones originated from Herefordshire,⁵ presumably the W. side of the Teme Valley. Its ease of working led to its widespread use in churches, especially by the Normans for window framing, tympana and quoins. However, it is too coarse and open in texture to be carved. Its rough surface also gave a good bond for the plaster for wall paintings.

Fragments of tufa are found in at least some sixteen churches in the county. Aymestrey Church has dressings of ashlar and tufa plus re-used blocks and quoins from the 12th century E. wall. These stones no doubt originated from spring deposits in the surrounding Silurian limestone.

Wigmore Church also has blocks of tufa. There was an old chancel arch entirely made from large tufa blocks, some massive, but removed in the 1860-70 renovations and later found in various garden rockeries.⁶

At Bredwardine the early Norman nave has tufa quoins externally, a Norman S. doorway of tufa, apart from the shaft capitals, and a Norman N. doorway with a tufa tympanum.

Letton Church has a Norman S. doorway and a tufa tympanum but unusually the tufa frieze has been carved, albeit simply. Tufa is also used as a decorative string-course on the N. wall.

In Hereford the Bishop's two storey chapel, known as the chapels of St. Katherine and Mary Magdalene, was very early Norman, perhaps part Saxon, built by Bishop Losinga before 1095. Again tufa was much used. It was destroyed by Bishop Egerton in 1737 but part of one wall still survives and is one of the oldest remains in Hereford. Older windows have been partly blocked with tufa re-used from the dismantling, some further blocks were used in the Quay Street wall of the Vicars Choral.

Some early chapels and churches were almost entirely built of tufa. The ruined chapel at Lower Brockhampton by Bromyard is mostly composed of large blocks. Tufa is still being laid down on a small scale in nearby Brockhampton Dingle. The shallow, fast-flowing water is silt coloured but clear and the stones are tufa-covered. The sides of the dingle are very steep - was it deepened by quarrying activities in the past and was this the source of stone for the chapel?

Moccas Church is an example of an early Norman church, apart from the bellcote and some Decorated windows (it is perhaps older than Kilpeck). It is made entirely from tufa apart from the sandstone jambs of windows and doors and the decorative mouldings. Like other nearby churches it is built of tufa probably formed from the outwash springs derived from the cornstones. Where had so much tufa come from? Such abundance implies a reasonably nearby source.

At Moccas Court there is a steep little valley containing a stream to the Wye. Tufa is still being deposited along its bed and bankside to a small degree. Its shape is unusual ending abruptly upwards to level fields. Was this the stone source for the church? On a visit to Moccas Court and church by the Woolhope Club in 1891 the President and host, the Rev. Sir George Cornewall showed members the dingle which he had converted into a steep-sided rockery of tufa pieces and planted with many rare ferns and foreign plants. (Photos taken in 1980 after tidying up and in 1997 show the abundance of plant growth in this sheltered dingle which has almost enclosed the rockery itself.) After lunch members then visited nearby Depple Wood where many small exposures of tufa were located in the beds of several streams to the Wye. Some astonishment was caused when it was seen how much fresh tufa had reformed since the removal of two waggon loads to repair the church. When further stone was required it had to be brought all the way from Shelsley Walsh.⁷

At Clifton-on-Teme the upper parts of the church and tower are composed of much tufa but at nearby Shelsley Walsh again the 12th-century Norman church is built entirely of tufa and restoration work in 1859, 1908 and 1980 still involved its use. (The church is also remarkable for its roof tie-beams, collar-beam and 15th-century richly-carved oak rood and parclose screen, all of one structure and one composition.)^{*}

Stone for the church and the nearby 19th-20th-century lodge cottage came locally from Southstone Rock, the fossil deposit mentioned in relation to Worcester Cathedral and Moccas. It is one of the largest old deposits in the country. The steep hill-sides flanking the W. side of the Teme have several small calcium-rich streams cutting down to the river. Local names imply past quarrying over an area of a mile such as Rockwood, Rock Coppice, Witchery Hole, Devils Den, Wastehill Wood, Marlpits Coppice, Pitlands Farm and Hell Hole.

When the Woolhope Club visited Southstone Rock via Sapey Common in 1892 they estimated it to be 50-60 ft. high. Sir Roderick Murchison spoke of it in 1833 as being a cavernous rock of approximately 50 ft. and covering half an acre.^o More accurate estimates made in 1993 show that the rock covers 3 hectares (2½ acres) is 15 m. high and 100m long.¹⁰ This present size is despite years of quarrying for building stone.

The remaining mass has a bluff precipice of columnar structure. It is full of small caves, winding clefts and passages that lead from base to summit. Some centuries ago it was spoken of as a retreat of hermits and a resort of pilgrims to taste the waters of the holy well with its miraculous power. Some rooms or cells had been hewn into the rock and at the top was a tiny chapel dedicated to St. John - a chapelry of the abbey of Evesham.¹¹ When the Club visited it they found a small cottage on the upper levels with 'an enviable allotment of garden' also a large area of Mimulus, or monkey flower, in a 'profusion of golden blossoms.²¹² Making the ascent this winter it was too late for any flowers, if any remain, as the site is shaded by woods. The shell of the cottage was found but the whereabouts of the chapel was doubtful as the summit is forested and strewn with tufa boulders. To one side of the mass is a ravine cut by the present stream. Erosion today probably exceeds any deposition.

Craswall Priory has tufa blocks at the tops of shafts, in the remains of tumbled vaulting and in parts of the walls as later infill. The Grandmontines always sited their monasteries nearby sources of good building stone and there is a well-worked quarry on the hill-side above. Past speculation as to the origin of the tufa itself led to the supposition

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that they brought it from Depple Wood by Moccas, its lightness in weight would compensate for bringing it that distance. However, near Capel-y-ffin in a tributary valley of the upper Honddu was a large mass of tufa 30 ft. high by 24 ft. wide which appeared to have fallen from the rocks above, where there are streams emerging from bands of cornstone. This large block was visited by the Club in 1867 and 1892¹³ (and nearly by myself in 1998 but the latter excursion was ice-bound and failed). The size mentioned would imply sufficient material was available nearby for use at Craswall.

Other sites visited and showing present-day active deposition are in the valleys around Dinmore Hill where lime-rich waters emerge from the cornstone layers in the welljointed sandstones e.g. Howe Wood, Wychall and Westfield Woods - both parts of an S.S.S.I. of ancient woodland. Further afield is Hill Hole Dingle carved by glacial meltwaters after the Humber Brook was diverted. At its upper levels a spring-line releases a series of calcium-rich waters giving shallow deposits of tufa with its associated mosses. Several Nature Trust reserves also have similar shallow deposits accumulating today.

At New Weir gardens, owned by the National Trust, five miles upstream from Hereford, is another site of active deposition. The name is deceptive as no weir exists - there was one 100 years ago but a further half-mile downstream. Springs occur at the base of a steep slope below the house and gardens and flow into the Wye. They seep through a retaining stone wall below the gardens and also near the tower bases and revetments further along. The latter are Roman in origin and have withstood the action of the Wye over the centuries, showing that the river has not changed its course much at this point. Excavations by Ron Shoesmith in 1977 confirm that the terrace above the slope was occupied during part of the Roman period with buildings of some stature, perhaps a villa complex, occupying 70 m. in length.¹⁴ Pieces of tessera, pottery, glass tile and bricks have been excavated along the terrace and found on the river-bed. Also found in the river by the Cotswold Archaeological Trust in 1991 was a tufa voussoir suggesting a vaulted roof in some part of the complex.15 Therefore, tufa deposition seems to have occurred in the past in that vicinity and to a lesser extent today. The largest is fan-shaped with luxuriant moss growth and topped by Mimulus in the summer but its proximity to the river can cause undercutting during the winter floods. Other shaded runnels are slower flowing and barely cover the grass and stones with tufa. Immediately downstream of the lower revetment a spring gushes out cutting a channel in the thick tufa already deposited. For the first time for many years it dried up this summer. (Samples of dry moss were still viable once reimmersed in water despite weeks of drought.)

One of the best sites for active deposition is Dripping Wells near the Biblins. The steep carboniferous limestone cliffs give the dramatic landscape of the Seven Sisters just downstream. At the point of Dripping Wells water coming out of the limestone of the Great Doward accumulates in a small bog above the cliff. This has scattered scrub and bog vegetation of cotton grass, phragmites, equisetum and carex species.¹⁶ The continual dripping and flowing of these waters over the cliff edge has caused a considerable accumulation of tufa both vertically and in base fans. Great pieces have broken away into large, irregular masses. The waters then collect into a lower marsh of lime-loving plants before draining into the Wye via a stream in the pastures.

Tufa is normally deposited just downstream of a spring by which time changes in pressure and temperature have occurred. The flow of water is rapid therefore plants and animals living there have to be able to cope with the water rates in winter and in rainy periods. In summer the flow could be reduced to a trickle leading to the danger of dessication.

Bryophytes, i.e. mosses and liverworts, can only exist in wet conditions if they are to reproduce sexually. Mosses are fragile with merely a small holdfast of fine root hairs, or rhizoids, as opposed to a root system and the leaves are only a single cell thick served by a midrib from a delicate stem. They have no woody tissue consequently they can be torn and fragment in the water flow. The liverworts found in association on tufa deposits are thicker and tougher in structure, more compact in shape and not differentiated into stems and leaves so they are less vulnerable.

In addition to coping with fast and variable water flow, plus the instability of their substratum, the bryophytes have to be lime-loving and able to thrive in alkaline conditions of pH 8-9.

The greatest difficulty for all the plants and animals is coping with the actual tufa deposition itself. The average build-up of fresh tufa in a climate such as Britain is today up to 5 mm. per annum.¹⁷ This occurs mostly in summer when calcium carbonate is deposited at a greater rate (unlike most other solutes which are deposited faster in colder temperatures). This steady accumulation of a limey layer shades the mosses and hinders their ability to maximise on the sunlight available for photosynthesis. Where the tufa is more crystalline sunlight can be reflected away further hindering photosynthesis as well as damaging delicate cell structures.

One moss in particular *Cratoneuron commutatum* nevertheless thrives in alkaline conditions comprising the bulk of the plant community and found in all sites visited. As the fresh tufa accumulates the rhizoids are gradually 'cemented in' giving a stronger grip but so too are the lower stems and leaves. Growth must therefore exceed deposition if it is not to be overwhelmed. As mosses grow on average 3-5 mm. per annum the youngest stem tips where most photosynthesis occurs must remain just ahead of deposition.

Cratoneuron often attains 100% cover. It is a polymorphic species with growth form related to water speed. In times of spate it can be stripped of its leaves and whole patches torn away. However, regeneration will occur. Where it is sheltered it grows into broad pinnate fronds with a related but more delicate moss *Cratoneuron filicinum* intermingled. Liverworts, especially *Pellia endiviifolia and Conocephalum conicum* are common among the mosses and amid boulders. In tufa seepages where the flow is less rapid a more diverse bryophyte flora is found such as *Aneura pinguis, Bryum pseudotriquetrum* and *Eucladium verticillatum*.¹⁸

Eucladium is well distributed on the steeper slopes of seepages with low levels of illumination forming dense dark green cushions of stems packed closely together. Growing at 3 mm. a year it can only survive in areas of slow deposition but eventually the whole colony is converted into a rock-hard column.¹⁹ It is believed that the extreme growing tips secrete a calcite inhibitor. Lower down the stems colonies of bacteria, algae and fungi

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become numerous amid which further crystals of calcite are trapped so speeding up deposition further.

As the encrusted mass of Cratoneuron builds up it acts as a filter to the water-flow further trapping twigs, leaves and other debris which in turn accelerates tufa build-up. As well as providing the physical means of accretion it also aids it chemically as the mosses remove carbon dioxide from the water in photosynthesis. It has been calculated that 10% of the tufa deposition is brought about by photosynthesis, 10-20% by evaporation and 70-80% by loss of carbon dioxide generally.²⁰

As a result of their bulk cover Cratoneuron species are often considered to be the prime tufa builders also making dams and allowing the sideways spread of water and accretion. However, living among the bryophytes is a rich algal flora equally, if not more, responsible for the trapment and build-up of tufa particles.²¹ This flora is dominated by the filamentous blue-green algae, the Cyanophycae or Cyanobacteria, a group half-way between plants and animals and probably the first organisms to evolve producing oxygen and the build-up of our atmospheric oxygen. In addition, there are also green algae and diatoms, these simple plants can be found in most freshwater environments but in tufaceous conditions they have to cope with lime build-up which in fact they are accelerating. This they do by being either single-celled and very mobile, or by the secretion of mucilage for protection.

Algae are essentially aquatic plants ranging in size from the one-celled diatom to the huge marine brown kelps. When growing in limey conditions layered, roughly bun-shaped structures can form with annular rings of winter and summer growth and seen when examined microscopically, both in the present day shallow deposits or in older large 'fos-silised' deposits. This season variation can be disrupted by variable light intensities.²²

The blue-green algae are responsible for the patches of yellow-brown colouration in the forming tufa. Many are endolithic, i.e. growing below the tufa surface. The most common is *Schizothrix calcicola* which is minute growing in the upper 2-3 mm. of fresh deposits.²³ It belongs to the Oscillatoriacea family and able to glide as a result of its secretion of mucilage. The cells are very simple with no nucleus and gathered into filaments, or strands, each contained within a thick polysaccharide sheath which produces the mucilage. It is tinted yellow having carotenoid pigments but the lower filaments are blue-green. The outer yellow pigmentation gives protection against high light intensities which it cannot tolerate so some covering of tufa is not necessarily a disadvantage. The mucilage sheath gives protection, allows growth and movement but also traps further tufa particles thus accelerating build-up. As the filaments of cells glide over and amid the tufa substratum they gradually discard their old sheaths which remain below the living algal layer until eventually destroyed by micro-organisms finally leaving behind minute 'ghost tubes' in the tufa.

The most conspicuous blue-green algae, but not the most abundant, is *Rivularia* haematites appearing as dark brown buttons a few mm. in diameter on the stones of the stream bed.²⁴ Rivularia also traps particles on its mucilaginous sheaths ultimately growing larger than Schizothrix but being non-motile must ensure growth exceeds deposition. If successful it can grow into hemispherical shapes which helps to reduce dessication.

Scytonenia mychrous also occurs as one of the blue-green algae growing on the surface of the tufa rather than below and forms dark brown branching colonies of filaments. Its narrower sheath secretes less mucilage so remaining comparatively free of deposition.²⁵

Although the blue-green algae form the larger algal biomass green algae are also present. The commonest is *Gongrosira debaryana* consisting of irregular plates of cells branching to give bright green colonies on the stream-bed stones.²⁶ Other green algae found are filamentous and to grow on or amid the bryophytes. These are species of Oedogonium, Zygnema, Spirogyra and Vaucheria which also secrete mucilage.

Another form of green algae are the single-celled, motile diatoms either unattached and capable of rapid movement, or fixed to the surface of other algae. Diatoms are green or brown in colour with their cells' walls richly impregnated with silica. In spring, when algal reproduction is most active, patches of orange or white mucilage are visible to the naked eye. Samples of this jelly when seen under the microscope revealed large numbers of diatoms within, such as Navicula species and Pinnularia.

Thus much of the tufa formation is brought about mechanically by these plants. A complete list of the flora is extensive so only a few have been dealt with here. Vascular plants are uncommon on the accreting tufa - most root amid the bryophytes such as Brooklime, Herb Robert, Mimulus and Butterwort. Butterwort is insectivorous and associated with acid boggy surroundings usually, however, in alkaline water-logged soils there is insufficient oxygen for the nitrogen-fixing bacteria to thrive so a plant that obtains its nitrates from trapped insects can be equally at home in bogs or fen conditions.

The various invertebrates are relatively inconspicuous as most hide amid the bryophytes to avoid being swept away which also reduces tufa deposition on their bodies. Trichoptera, or caddis fly, larvae need fast-flowing water to obtain maximum oxygenation. In adult form they resemble moths but their wings are clothed in fine hairs rather than scales. The larvae are soft-bodied with many pairs of hair-like external gills, as they creep about dragging their case behind them only the armoured head and thorax are exposed. The case can be pieces of leaf, twigs and small stones held together and lined with silk extruded from the larva. The fine eroded particles of tufa and broken moss fragments are ideal for case making and act as camouflage. Some species make cases of silk only or remain caseless with a silk net facing upstream to capture plant and animal food. Most are vegetarian but the Rhyacophila species can be found amid the mosses with bright green to brown bodies, they are caseless and very active and carnivorous. Repeated body moults of these invertebrates and their final adult emergence prevents deposition.

Some freshwater snails have gills but others have lungs having evolved on land then returned to water - these must surface frequently for air. Land snails have thicker shells and amid alkaline conditions can make them even thicker. Found among the mosses are mostly land species, usually younger smaller snails that creep into the edges of the soaking bryophytes for moisture, protection and soft feeding.

Samples taken from the mosses at forming sites gave various invertebrates. A typical one, the Freshwater Shrimp, *Gammaraus pulex*, occurs in well oxygenated water. It moves vigorously and again its repeated body moults prevent accumulation of tufa.

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Planarians, or flatworms, are abundant creeping into the underwater tufa crevices and mosses. One centimetre long, they are covered with fine hairs or cilia which are in constant motion both circulating currents and allowing the animal to glide over surfaces. They also secrete mucous for lubrication - both characteristics prevent tufa build-up in these surroundings.

Among the microfauna are single-celled protozoa. Tantalising glimpses were obtained under the microscope as they 'rowed' past using their cilia and a rotating movement. Their short lives are completed before becoming encrusted.

Known to live in these surroundings and much searched for in vain are the Tardigrades or Water Bears.²⁷ They are in a class of their own, approximately 1-2 mm. in length, living among the wet mosses. Multicellular, they are covered with a transparent, pigmented, flexible cuticle of chitin which protects them from dessication. They have four pairs of stumpy legs ending in claws which gives them their characteristic bear-like gait.

Stonefly nymphs (Plecoptera) are an archaic group only found in fast-flowing fresh water. Two-tailed and looking like large earwigs they are easily distinguished from the three-tailed Mayfly nymphs. One genus, Nemoura, 10 mm. in length, is small enough to respire through its body surface. The larger Protonemura species possess two tufts of three sausage-shaped gills below the thorax. Both are abundant and again repeated skin moults prevent encrustation before their final emergence after 18-36 months.

One group in particular, the Moth Flies or Psychodidae, are specially adapted when living in these conditions. The adults of the family are tiny flies often called Owl Midges with their wings and bodies covered with conspicuous tiny hairs. Some species lay their eggs in sewage beds but the larvae and pupa of *Pericoma Walker*, particularly *P. trifasiata* and *P. calcilega* are confined to such calcareous habitats and are found encrusted with lime.²⁸ Under the microscope its eleven body segments are divided into further annuli from which are outgrowths called setae, some true and presumably sensory while others are accessory. The setae vary in size but are all scythe-shaped. There are even some among the respiratory pores and hairs at the end of its body. Those on the back and sides of the body curve backwards so diverting lime on to them and away from the sensitive body. This encrustation can both camouflage the larva and prevent dessication when water-levels fall. The pupa also has these setae.

One is continually brought back to the question of past and present deposition rates. Most large-scale tufa sites are inactive today in Britain although its formation can still occur on a minor scale. Greater deposition is only possible in warm, wet climatic periods when a higher level of biological activity coincided with an increased reaction rate between the calcium carbonate/carbon dioxide interplay.²⁹

Evidence gained from a number of British fossil tufa sites, mainly using faunal remains and stratigraphy rather than carbon dating which is not entirely satisfactory, suggest that deposition was widespread in the chalk and limestone regions of Ireland and southern England in the immediate post-glacial periods of the gradually warming Pre-Boreal and Boreal periods and the much warmer Atlantic period. These range from 10,000 years ago to the Atlantic period some 7,500-4,500 years ago.³⁰ The warming climate and

increasing rainfall allowed the development of temperate marshes and thence into a scrub and then woodland landscape. Deposition in bulk seems to have ceased by the close of the Atlantic period between 5-4,000 years ago. With another climatic change leading to drier and cooler conditions a less turbulent discharge of water and dissolved carbon dioxide would occur leading to less tufa formation. This reduction would also protect the existing deposits from further erosion and downcutting.

To take just three larger national sites, two in Clywd are of importance as they have yielded faunal remains indicative of climate and environment at that time and one site has mesolithic remains which gives an even more accurate dating.

At Caerwys the tufa extended as a large fan and waterfall deposit down a tributary of the river Wheeler. This is the largest deposit in Britain covering 81 hectares/200 acres. Quarrying for agricultural purposes has removed much of the rock and in the process revealed the internal structures. Sampling at two quarry faces worked since 1939 has yielded snail shells of thirty-three species in different layers. These give a scenario of braided hardwater streams in shallow runlets over a surface of sands with rapid evaporation. At first temperatures were too low for tufa to form and sedge-bogs grew up. With later warming these were overlain by tufa which built up into two barrages upstream creating ponds behind with flat crusts of tufa. Seepage through the porous dams led to a third and larger barrage downstream. Colonies of bryophytes flourished creating an open framework for further deposition and colonisers such as blue-green algae would have provided a further framework. Fossilised remains of all of these have been identified. After the close of the Atlantic period the whole series would have developed into marsh then carr-scrub and finally into its climax of woodland.³¹

At Prestatyn, also in Clywd, is a site of 12 hectares/30 acres where snail shells of eighteen species have been recorded, again mostly terrestrial rather than freshwater.³² Ecologically, the assemblage suggests a well-established woodland giving a relatively undisturbed habitat where shelter and moisture were abundant.

The site, now beneath a building estate, consisted of a shallow basin amid glacial boulder clay filled with tufa and with three small islands rising from the floor. On two of these mesolithic flint-chipping factories were found with cores, flakes, scrapers and microliths. These put the dating at the early phase of the Atlantic period during which the overlaying tufa was deposited. It is not clear how much, if any, tufa formed prior to the arrival of these people but it continued to form after their abandonment of the site covering it to the depth of 26 cm./2 ft.

At Blashenwell near Corfe Castle is the largest known site in S.E. England, of 8 hectares/20 acres, where a similar mesolithic industry has been found. A tufa bed of 2.4 m./8 ft. overlying a loam bed was covered by 30 cms. of black soil containing Romano-British pottery at its base.³³ Extraction for liming had occurred in the past with later infilling. A pit since excavated has revealed flints and charcoal scattered throughout. Early man seems to have camped on a neighbouring hillside from which some of his settlement debris washed down, or was thrown, giving a midden in the accumulating tufa. Bones of pig, ox, roe and red deer have been found also marine shells which spoke of visits to the coast for food and perhaps more raw material for the flint working. Twenty species of

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snail shell have been recorded - again predominantly terrestrial. Sampling has revealed a later environmental sequence of an early wet marshy ground phase followed by a partial opening up of the vegetative cover - possibly due to human interference. Radiocarbon dates for the bones range from 5750 ± 140 b.p. and 5425 ± 150 b.p. (before present time). An early Bronze Age grave cut into the tufa implies deposition had ceased by then. The stream responsible for this past accumulation still flows intermittently today but does not deposit tufa.

The explanation for this post-Atlantic cessation is not entirely clear. Some researchers connect it with the destruction of neighbouring forests as well as the changing climate.³⁴ Deforestation, started on a large scale by Neolithic man onwards, has caused a widespread environmental change over the last few thousand years and could explain the decline of tufa production in Britain. Deforestation could lead to many adverse conditions such as:-

a) increased run-off after the loss of trees leading to the erosion of the deposits,

b) increased turbidity of the water reducing algal productivity and causing asphyxiation to the micro-plants, consequently giving,

c) reduction in soil carbon dioxide with the loss of root productivity so leading to a lower input of calcium salts into streams, and

- d) reduced organic debris which had allowed barrage build-up,
- e) with the loss of trees a build-up of peat and increasingly acid water run-off would counteract the alkalinity required.

Thus, tufa is climatically controlled in its development. Chemically it is indistinguishable from stalactite/stalagmite composition except the latter are formed in caves while tufa is formed in open air with the association of its flora. Tufa is consequently more suitable as a climatic indicator since it is free from local humidity extremes occurring in caves. It is a valuable source of vegetational history extending well back into the Pleistocene, although British deposits are mostly post-glacial. Bryoliths, or solidified bryophyte species, can be found in the tufa as well as faunal remains and examination of these give growth rates in relation to rainfall and climate. Other twig and leaf debris with pollen grains are also petrified and give a further source of vegetational history related to climate. The snail types found are related to specific habitats and can be used as indicators of vegetative changes in ground cover operating at that time even the degree of forest clearance. It is an added bonus when the deposits reveal archaeological evidence also.

It seems unlikely that tufa will be deposited on such a large scale in Britain in future, even with climatic change, as the widespread human effects on the landscape combined with the use of chemicals, especially phosphates, will hinder the process.³⁵ So also will our water management affect the process. It is still forming in other parts of the world such as Mexico and Yugoslavia. It is unique in being the most recently formed rock on land apart from consolidating lava flows.

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Archaeological Excavation at 46 Commercial Street, Hereford

By RICHARD STONE

Synopsis

The excavation at 46 Commercial Street revealed that the site was first occupied soon after the laying out of the new Norman market place. The road system was probably in place by the early 12th century when a building with stone foundations and a flagged floor was constructed. Until the 14th century butchery appears to have been practised commercially, but by the post-medieval period the use had become industrial.

INTRODUCTION

46 Commercial Street was purchased by Chadds of Hereford to increase retail space, but as the existing building was not suitable for that use planning permission was sought for demolition and replacement with an enlarged building to include a basement. The new building was to have a similar façade to the Commercial Street frontage and a three-storey façade to Union Street. In advance of the demolition, the City of Hereford Archaeology Unit was commissioned to produce a desk-based assessment of the archaeological potential of the site (Thomas, 1991). Subsequently, a condition was imposed on the planning approval, requiring archaeological excavation within the area of the proposed basement. Chadds of Hereford kindly funded this excavation which was carried out by the City of Hereford Archaeology Unit. An interim report was produced soon after completion of the fieldwork (Stone, 1992).

This article presents first an outline history of the site and a brief description of the buildings. This is followed by a report of the excavation, specialist analyses of the finds, and a concluding discussion of the evidence gathered from the project.

OUTLINE HISTORY

The site occupies a block of land that extends from Commercial Street at the N.-W. to Union Street at the S.-E. (FIG. 1). This area lay to the N. of the walled settlement during the Saxon period. Other sites to the N.-E. of the Saxon town have revealed little evidence of Saxon occupation, and it has been considered that this area was under cultivation at this period (Thomas, forthcoming).

Shortly after the Norman Conquest, the earl of Hereford, William fitzOsbern, gave some of his land at Eaton Bishop to Bishop Walter for 'land in which the market is now and for three hides at Lydney' (Morris, 1983, 2.8). In this area he laid out a new marketplace beyond the Saxon defences. The market was an irregular triangle that included High Town together with the area bounded by Commercial Street, Union Street and St. Peter's Street. 46 Commercial Street lay within this new economic focus of the city. The foundation by Walter de Lacy of the monastic church of St. Peter with its precinct, *circa* 1085,



FIG. 1 Location of the site

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must have had a great effect on the layout and colonisation of this part of the market place.

Much of the area around the market-place is likely to have been laid out as burgage plots at the time of the creation of the market, helped by an early tax incentive, these dwellings paying 3½d. rather than 7½d. for dwellings within the city wall (Morris, 1983, [C6]). However, the market-place is likely to have started as an open area with temporary stalls. Only later would it have become infilled with more permanent buildings. Although this may have been a gradual process, burgage plots surrounded much of the market-place by the end of the 12th century (Thomas, forthcoming). The recent excavation at 16-18 High Town produced evidence for a high status dwelling of 12th-century date, including a Roman-style roof (Appleton-Fox, forthcoming) and it is likely that the triangular area was also fairly well built up by this time. As the infilling occurred, the frontages obviously became the most desirable and important part of each property. It is probable that most of the Union Street and Commercial Street frontages were in different ownerships, the property boundary being behind the dwellings.

The earliest reference to what was eventually called Commercial Street was in 1264, when it was known as Bishopstreet (Tonkin, 1966, 239). It continued to be known by this name and its variants, including Bye Street, until the 19th century. Confusingly, however, in the 17th century it was also referred to as St. Thomas Street (WRO BA81). The same document refers to Union Street as Old Scull Street. Speede's Map of 1610 shows it as Olde Street. This may be a contraction of the later Old School Street. In the 18th century it was known as Gaol Lane, after the city gaol in Bye Street Gate, before becoming Union Street in the 19th century.

The survival of a house of *circa* 1400 at 50A Commercial Street indicates that the layout of the triangular block between Commercial Street and Union Street had been well established by the early 15th century, if not much earlier. Development during the post-medieval period included rebuilding and alteration of individual plots.

The evidence from early maps is of some interest in interpreting the fortunes of this area. Taylor (1757) shows both frontages fully built up, but the buildings fronting Union Street are almost all single pile, and may well not be dwellings. Curley's plan of 1858 substantiates this, showing many of the buildings on this frontage as industrial or outbuildings as opposed to residential. Only minor changes occurred during the rest of the century, as is shown by the Ordnance Survey plan of 1886. The Commercial Street frontage of 46 was still the main focus, with the Union Street frontage being no more than ancillary buildings. In 1891 the site was occupied by J. & R. Williams, Grocers (Kelly, 1891). By 1937 it had become a branch of W. H. Smith (Kelly, 1937).

THE DEMOLISHED BUILDINGS by R. K. Morriss

The principal structure on the site was a three-storey block, over cellars, fronting onto Commercial Street (PL XVI). It was built of red brick, later painted, and had just two bays. The plain gabled roof was aligned parallel to the street and was covered in slate. On the Commercial Street side the roof was hidden behind a rebuilt plain parapet, but this had slightly overhanging eaves on the rear elevation. The two end gables were coped. The balanced sash windows on the first and second floors of the façade had plain surrounds with stone sills with simple brackets. The window heads were of simple rusticated cambered flat arches. The sashes were deeply recessed into the openings. The ground-floor shop front was very new and an illustration of the earlier shop front is in a recent book (Foxton, 1991, 46). At the rear, the visible windows had plain segmental heads in brick.

The cellar was mainly of stone, but had no features to provide a construction date. It could well have been re-used from an earlier building.

A clear vertical break in the brickwork showed that this building was separate from the buildings to the N.-E., the block to the S.-W. being obviously recent. There were very few datable features in the property but the general characteristics indicate that it was of mid-to-late 19th-century date, probably in the third quarter of that century.

To the rear was a flat-roofed single-storey extension, originally ending in a shop front on Union Street. This presumably replaced a series of older outbuildings connected with the frontage block. It was of early 20th-century date, probably c. 1910, and the original architect's plans survive.

THE EXCAVATION

Introduction

Although the area of the Norman market-place extended into this part of the town, there had been no previous archaeological excavations in the block bounded by Commercial Street and Union Street. The project was designed to add to the understanding of the development of this part of the city, particularly by establishing the period at which temporary stalls gave way to permanent structures and the subsequent status of the property.

For the purposes of this report a site N. is used; true N. is shown on FIG. 2a. The northern part of the site had been previously cellared, losing most of the archaeological information. The investigation therefore concentrated in the southern part of the site where two trenches were excavated for the full depth of archaeological deposits. The northern one (trench A) was 9m. by 2.5m., and the southern (trench B) 5 m. by 2.5m. Salvage recording was undertaken on all other ground works, which were excavated by a small mechanical digger. The context numbers shown in the illustrations are, in the City of Hereford Archaeology Unit series, preceded by a 5 to provide a unique number.

Period 1a - Before the middle of the 12th century

The lowest level consisted of a buried soil above the natural gravels (FIG. 2b). Patches of a cobbled surface (731) survived at the S. of trench B. In this area the buried soil appeared to have been cut away to lay the cobbles directly on the more solid gravel. This may relate to the early use of the site as a market with a surface of cobbles. Salvage recording of the rest of the site indicated that the natural deposits were at roughly the same level throughout the plot, with a thin band of buried soil present in the northern part of the site.

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FIG. 2 a) Extent of the excavation b) periods 1a and 1b

In trench B there was an area of pits (715, 735, 740, 741, 743) and one gully (733), some of which cut the cobbled surface. Only one post-hole was found (680), within pit 740. A stake-hole (672) cutting the cobbles may be of this period.

Towards the N. of trench A, several post-holes and stake-holes (534, 535, 538, 541, 547) were cut through the natural gravel. These were sealed by a layer of burnt material (532) which covered the whole of the northern part of the trench. This was probably related to the destruction of a timber building that had a wattle and daub infill. Although most of the post-holes found below this burnt layer were probably part of this building, only one (547) was substantial enough to have been a major structural member, so the size and disposition of the building are uncertain.

Period 1b - Mid-to-late 12th century

In trench B a substantial structure was built in the mid-to-late 12th century, directly to the N. of the period 1a cobbles. It may have continued in use until the mid-13th century.

A large pit (696) with a flagged floor (694) and stone-lined sides, perhaps forming walling (702) was dug through the natural gravels, cutting the earlier deep pits. This was probably a sunken storage area, forming a semi-basement of a building (PL XVII). At the W. was an area of regularly laid cobbles built up to several courses (697). It is possible that this pre-dated the semi-basement as consolidation material for the top of the infilled period 1a pit 715. It is equally possible that it was a later patch, perhaps after a collapse of floor 694 into the period 1a pit. To the N.-E. of the semi-basement were traces of an E.-W. wall (723) which was probably associated with it.

To the E. of the semi-basement was a large post-hole (691) which contained the remains of a slender post (711). This was cut by a stone structure (707), possibly a pad or cill foundation, which merged with the stone lining of the flagged basement. No features of this period were noted in trench A.

Period 2 - 13th century

At the N. of trench A (FIG. 3a), cut by the S. wall of the cellar, were a rectangular pit (506) and a gully (545), later cut by a further rectangular pit (523). South of these features, several intercutting pits (521, 527, 543, 519) were cut through the period 1a burnt layer 532. A gully (511) running N.-E. was dug towards the end of this period.

Further S. were two further intercutting pits (628, 629), the northern of which (628) was rectangular and gravel-filled. It was not fully excavated, but is tentatively interpreted as a soakaway. At the S. of trench A were two intercutting rectangular pits (603, 605) which were filled with similar material. It is possible that these may have had some structural purpose, in which case they could be of period 3, associated with foundation 577.

A thick band of red silt (686), probably a levelling layer, covered a large part of trench B, indicating that the period 1a structures were no longer in use. To its S. a flagged surface (674) ran E.-W. directly S. of the period 1b sunken feature 696, overlying its S. wall. At the W, it slumped into the earlier pit 715.

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a) period 2 b) period 3

The N.-E. corner of trench B was again used for the digging of pits (677, 683, 684, 706, 720), together with a single stake-hole (717). These features were sealed by an accumulation of soil.

Period 3 = 14th century to mid-16th century

At the extreme N. of trench A (FIG. 3b) the line of pits was replaced by a shallow trench (491) which was itself superseded by a post-hole (496). The excavation of an ash pit (472) through trench 491 in the late 15th century may mark a hiatus in this use.

Further S. were more pits (509, 514). The edge of another pit (599) may have been part of the same feature as 514. These were sealed by an accumulation of soil (501, not illustrated). A series of rubbish pits of the late 14th or early 15th century covered much of the central part of trench A (606, 609, 612, 615). This use continued for some time, the latest recut (581, not illustrated) being the only pit in use in this area, dated to the later 15th century. A succession of patchy occupation surfaces of soil and clay surrounded these pits.

To the E. of these was a rectangular pit (575), the earliest use of which is undated, and may be earlier than period 3. Eventually a stone structure (556) was built, covering part of this pit complex. The pottery indicates a date in the late 14th or 15th century for its construction.

Cutting these layers was a pit (590). A post-hole (594) and three stake-holes (591, 592, 593) perhaps represent a fence line. A foundation (577) at the very S. of the trench was probably for the northern wall of a building constructed in the late 14th or early 15th century.

Throughout the period a series of layers, some of soil, others of gravel, accumulated over the trench (549, 572, 582, 584 - not illustrated). These were probably occupation surfaces external to buildings. A layer of burnt material covered the eastern part of the trench above these deposits. No features were attributable to this period in trench B, though some of the heavily truncated soil deposits may be of this period.

Period 4 - Late 16th and 17th centuries

The series of features at the extreme N. of trench A continued (FIG. 4a). The very narrow sandstone foundations of two walls (442, 443) at the N.-E. of the site had a pit (494) in the angle, which contained pottery of the late 17th century or later. At the N. the foundation appeared to return W. Beyond this, to the W., was a rectangular stone-filled soakaway (475). To the S. of the foundations was a small structural feature (457), perhaps the start of a foundation trench. Beyond this was an oven (481), built of early bricks on a sandstone base.

In the middle of trench A a stone and clay-lined pit (499) was constructed, probably during the 16th century, below a floor of stone slabs (500), one of which had a hole in to allow access to this structure. It is probable that, as the lining was watertight, the pit was used for storing liquid. The remains of insubstantial walls (467, 489) on three sides of this

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FIG. 4 a) period 4 b) period 5

structure suggest that it was covered, perhaps by a lean-to open to the S. The finds indicate a late 17th century or later date for the disuse of this structure. The pit and its associated walls were covered by dumped material and a subsequent build-up of soil and household debris, of similar date.

The southern part of the trench continued to be used for rubbish pits (447, 560) until around the end of the 16th century. A later irregular ground surface, perhaps a system of gullies (449), was filled by a layer of stones. The end of this phase was marked by an accumulation of mixed material (427) consistent with site clearance.

In trench B, a gully (699) was dug and then replaced by another one (652). These ran from S. to N. along the eastern part of the trench. The later gully was itself recut at some time and the underlying layers were stained green, probably from urine and perhaps excrement. The fill of the fully (644) was an accumulation of lime made up of many very thin layers. The majority of these layers were white but some were brown. The gully was undoubtedly associated with some industrial process. The finds from the upper fills were of the mid-16th century or later.

To the W. of this was a deep, robbed-out foundation trench (649) returning at the N. At the S. it was cut by another linear feature (655). This may have been a wider foundation or a pit. As the fills were very similar, consisting mainly of stone debris, it was probably also a foundation. The finds from the robbing indicate a demolition in the 17th century. A feature at the junction between the two (663) may be either a post-hole, or simply the bottom of one of the two trenches.

Period 5 - The 18th century and later

The series of features at the N. of trench A in this period were represented only by the surviving 19th-century cellar (FIG. 4b). The only feature in the area was a well (410) which fell into disuse in the late 18th or 19th centuries. It may have been dug as early as the late 17th century. Another well, also backfilled in the 19th century, was found to the W. of trench B during salvage recording.

South of the well in trench A a large complex of rubbish pits (478) was in use in the later 18th and 19th centuries. They had many fills and several shallow recuts extended the full width of the excavated area and cut through all earlier deposits.

To the S. of this was an early-18th century sandstone foundation (473) cut by a pit complex (562, 568, 580). The earliest of these was cut by a rectangular post-hole (462) but the pits continued in use throughout the rest of the 18th century and into the 19th.

A stone pad (435) and a shallow rectangular post setting (440) at the N.-W. and S.-E. of pit 478 indicate a structural phase, perhaps after the infilling of the pit. Two postholes (429, 459) and two stake-holes (431, 438) may be associated but they were not connected by any clear surface and as only post-hole 429 produced closely datable finds, it is unclear whether any or all of these were associated.

In the southern trench there were several minor features, including a pit (642), two post-holes (637, 640) and a stake-hole (657).

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Several foundations (419, 422, 425, 631, 635) associated with brick buildings, including the one demolished as part of the current re-development, cut through the earlier deposits.

Salvage Recording

During salvage recording to the W. of trench A a large amount of late-medieval and later pottery, including several chafing dishes, (PL XIX) was recovered. This clearly derived from rubbish pits and some of the sherds fitted material found in the period 5 pits to the W. of trench A.

THE FINDS

THE POTTERY by Alan Vince

A collection of 1493 sherds of medieval and later pottery was analysed. These comprised at most 1085 vessels (Table 1). An archive catalogue of the collection and an archive report, describing the evidence for dating, site sequence and implications for the wealth and status of the site's occupants through time, were produced (Vince, 1992). The types series follows that in Vince, 1985.

Period 1a

A single sherd of pottery was recovered from the cobbled surface 731, a fabric B1 cooking pot. Another sherd of the same type was recovered from context 546, the fill of post-hole 547. These indicate that the cobbled surface was constructed (or in use) and the post-hole was backfilled in the 12th century. Despite this, the destruction debris from the building or buildings with which the post-hole was associated, 532, contains only pottery types which could have been in use in the later 11th century. The nine sherds recovered from context 532 are of fabrics C1 and D2, both of which are likely to have a mid-to-late 11th century starting date in Hereford. One of the D2 sherds came from a cooking pot with an everted rim. This simple form is thought to be early in origin in Gloucester, where fabric D2 cooking pots form the majority of sherds in 11th and 12th-century pottery assemblages.

Trample, 718, over the southern cobbled surface (731), produced a small assemblage of 12th-century pottery including a D2 cooking pot with a flat-topped everted rim. Vessels of this type appear during the 12th century at Gloucester, replacing the simple everted types mentioned above.

The area of pits at the S. produced few sherds of pottery, but included a rim sherd from a B3 tripod pitcher, a type which was current in the later 12th and early 13th centuries, from the fill of pit 715. A body sherd of a similar vessel was recovered from a patch of gravel, 692, overlying the trample 718.

Period 1b

No pottery was recovered from the period 1b pits, but a sherd of an A7B jug from 721, a patch of burnt material, dates to the middle of the 13th century or later.

Table 1 Maxiumum number of vessels by fabric in each period

Full name of ware	Ceramic	1a	1b	2	3	4	5	Total
Herefordshire ware cooking pots, tripod pitchers & jugs	A7			10	1		-	11
Herefordshire ware cooking pots and tripod pitchers	A3			6	- ^ I			6
Herefordshire ware tripod pitchers and jugs	A4			1				ĩ
Herefordshire ware, later wares	A7B		1	ni	70	13	37	132
Herefordshire ware, fine wares	A7C					8	13	21
Herefordshire ware, 17th century kilns	A7D				1	32	52	85
Herefordshire ware, Newent and Whitney wares	A7E				- ÷.		45	45
Herefordshire ware, cooking pots	A8			2				2
Herefordshire ware	A10			1		2	13	15
Malvern Chase ware cooking pots	BI	19		164	8		1	192
Malvern Chase ware tripod pitchers	B2	01000		1	10.025			1
Malvern Chase ware tripod pitchers and jugs	B3	2					- 1	2
Malvern Chase ware oxidised glazed wares	B4	70		1	114	59	89	263
Malvern Chase ware	BS				1	ii l	22	34
Border ware, green glaze	BORDG						2	2
Worcester ware cooking pots	CI	7	2	3	2		- 1	14
Worcester ware jugs	C2		100	1	5			5
Chinese porcelain	CHPO						1	1
Continental porcelain	CONP						- i I	i
Creamware	CREA						14	14
Cistercian ware	CSTN					1	8	9
Cotswold ware cooking nots and nitchers	D2	11		1			Ű	12
Cotswold ware tripod nitchers	02	100		1				3
Droitwich	DPOIT							3
Late medieval jugs	G7				0	1		12
Ham Green Bristol ware	un un			1	× 1	3	1	1.5
Cologne stoneware	KOLN						1	3
Miscellaneous	MISC				. 1		- 1	
Miscellaneous Colatord	MISC							
Wiscenations coletoid	Coloford						1	*
Missellaneous and and limestens tempered ware	L'USC L SV							
Miscenaneous sand and filmestone tempered ware	MISC LSY				1			1
Minutanus yeriowware	MIT						1	
North Daway gravel temperad up to	NUDW						2	2
Nottingham standard	NDGT						2	4
Nottingham stoneware	NOIS					1.12	2	2
Bril/Boarstall ware	OXAM					1		1
Pearlware	PEAR				1.12		9	9
Samtonge polychrome ware	SAIP				1			1
Spanish micaeceous ware	SPAM					1.10	1	1
Statfordshire brown stoneware	STBRS					1	14	15
Statfordshire brown stoneware	STBRSL						2	2
Staffordshire press-moulded slipware	STCO	1 1					2	2
Staffordshire coarseware	STCOAR					20	20	20
Staffordshire embossed press-moulded ware	STEM					1		1
Staffordshire mottled brown glazed ware	STMO					- 25	50	50
Staffordshire redware	STRE				I I	1	31	32
Stroat ware	STROAT					1		1
Staffordshire slipware	STSL					2	11	13
Staffordshire white saltglazed stoneware	SWSG						2	2
Staffordshire white saltglazed stoneware	SWSGSL						2	2
Tin glazed	TGW					1	11	12
Transfer printed	TPW					250	2	2
Tudor Green	TUDG					1	3	6
Westerwald	WEST					- 207	11	11
Total		30	3	208	216	138	480	1084

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Period 2

A total of 217 sherds of pottery was recovered from period 2 deposits, of which the only substantial assemblage came from pit 521 and was dated to the later 12th or early 13th century. Sherds of fabric A7B, however, were recovered from soil levels, the fill of cut 684 and the fills of pits 629 and 683. These were mostly jug sherds but included a fragment of ridge tile and a fragment of a possible finial from pit 629 (FIG. 5, no. 2).

Sherds of two later medieval types were present. These were the neck of a B4 pipkin from the fill of pit 523 and a sherd of a G7 jug from soil 515, which overlay this pit. The latter assemblage was otherwise entirely consistent with an early-13th-century date.

Period 3

Two hundred and ninety-four sherds of pottery were recovered from period 3 deposits. Of these, over a third came from 501, a layer of soil and refuse and formed an assemblage of later 14th to early 15th-century date. Pit 581 produced an assemblage of 56 sherds and the soils it cut included a collection of 36 sherds, both of later 15th or 16th-century date. The remaining sherds came from a variety of deposits, never producing more than 20 sherds each, from which *termini post quos* of later 14th or 15th century were obtained. Sherds of an A7D colander (from pit 615) and a B5 jug (from a soil layer) are assumed to be intrusive. The pottery in most cases belonged to the standard range of later medieval and Tudor types present in Hereford, but a sherd of a hand-made jug in a fabric containing limestone and quartz sand is unusual, as was a sherd of a Saintonge Plychrome jug (decorated with painted purple and light green lines) from layer 504 (=501). Pits 581 and 606 both produced sherds of Tudor Green ware cups. Fragments of a B4 tripod pipkin (FIG. 7, no. 14) form a useful example of a stratified vessel of this form. Later examples often have a thumbed, applied strip around the neck.

Period 4

One hundred and sixty-three sherds of pottery were recovered from period 4 deposits. The largest assemblage was a group of 26 sherds from the fill of foundation trench 649, dating to the 17th century and the assemblages ranged in date from the middle of the 16th century or later through to the later 17th century. Sixteenth century wares included A7C and Cistercian ware (CSTN) cup sherds and a range of B5 vessels. Later 16th and 17th-century wares included a range of A7D vessels. The only other locally-produced coarseware found was a possible sherd of a Stroat ware bowl from 427. Five sherds of possible Staffordshire slipware were found in period 4 deposits, including a white-slipped brown stoneware tankard from the primary fill of pit 499, below floor 500. This vessel ought to date to the last decade of the 17th century or later. Locally produced vessels from this pit include a fabric A7D tankard (FIG. 5, no. 3) and a fabric A7D bowl (FIG. 5, no. 4).

The unstratified material from the site includes three complete chafing dishes (FIG. 5, nos. 6-7 and FIG. 6, no. 8) and one complete B4 chafing dish (FIG. 7, no. 13). These vessels would normally be given different date ranges, 17th century for the A7D vessels and late



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15th or 16th century for the B4 vessel, but it would be remarkable if such unusual vessels were discarded at different dates on the site and it is more likely that all four date to the period of overlap of these two wares, in the mid-16th century. They are thus evidence for the existence of a substantial, rubbish-filled feature of mid-16th century or later date on the site and for the high status of the occupants of the site in the 16th century. A complete two-handled B4 cup is likely to derive from the same deposit (FIG. 7, no. 15).

Period 5

A total of 760 sherds, representing at most 479 vessels were recovered from period 5 deposits. Of these, an assemblage from pit 568 consisted of 119 vessels, mostly of early-18th-century date with a few later-18th or 19th-century types (Table 2). Pit 478 was more clearly of later-18th or early-19th-century date but likewise included early-18th-century types.

Table 2Maximum number of vessels in period 5 pit 568 by fabric and form

	Unidentified	BOWL	CHAMBER POT	cuP	HSIQ	DRINKING JUG	JAR	JUG	PIPKIN	PLATE	POSSET POT	RIDGE	TANKARD	TOTAL
A7B	0	0	0	0	0	0	0	0	0	0	0	1	0	1
A7E	0	26	0	0	3	0	2	1	0	0	0	0	0	32
B4	0	2	0	1	0	0	1	2	1	0	0	1	0	8
B5	0	0	0	0	0	0	0	0	0	0	0	2	0	2
CREA	0	0	1	0	0	0	0	0	0	0	0	0	0	1
MY	1	0	0	0	0	0	0	0	0	0	0	0	0	1
NCBW	0	0	0	0	1	0	0	0	0	0	0	0	0	1
STBRS	0	0	0	1	0	2	0	0	0	0	0	0	3	6
STCOAR	0	9	0	0	0	0	0	0	0	0	0	0	0	9
STMO	8	0	5	0	2	0	0	0	0	0	2	0	7	24
STRE	0	0	2	0	4	0	0	0	0	1	11	0	0	18
STSL	0	0	0	0	1	0	0	0	0	0	1	0	0	2
TGW	0	1	1	0	1	0	0	0	0	2	0	0	0	5
WEST	4	0	0	0	0	2	0	0	0	0	0	0	3	9
TOTAL	13	38	9	2	12	4	3	3	1	3	14	4	13	119

Local wares were represented by A7E bowls, dishes, jars and a jug. Probable Staffordshire coarsewares, slipwares and stonewares account for the majority of vessels. A small group of tin-glazed vessels is probably of Bristol origin (FIG. 8, nos. 18-20), and nine vessels of Westerwald stoneware are the only imports (FIG. 9, nos. 21-23 and PL. XVIII). The range of vessel types includes chamber pots and serving vessels but drinking vessels are particularly well represented. A number of these have evidence for sooting around the base, suggesting that the drinks they contained were served mulled. A *terminus post quem* is provided by a number of tankards (of both Westerwald and brown



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FIG. 7 Ceramic material (Scale 1:4)

stoneware, probably from Staffordshire) bearing the monogram of Queen Anne (FIG. 9, nos. 21-3 and FIG. 10, nos. 29-30). The interpretation of these assemblages is unclear. They do not contain a representative range of 18th-century types which would imply that deposition continued throughout the century. The characteristic mid-18th-century white saltglazed plates, cups and bowls are missing, for example. On the other hand, the fact that many of the early-18th-century pieces were clearly near-complete when buried, argues against re-deposition. Whatever the precise circumstances of deposition, the earlier material forms a large and interesting early-18th-century assemblage of at most 105 vessels composed of 274 sherds. A wide range of vessels from pit 568 and unstratified vessels presumably derived from the same source are illustrated. Locally-produced vessels include slip-trailed and sgraffito-decorated plates and dishes in fabric A7E (FIG. 6, nos. 9-12). All are paralleled amongst material recovered from the kiln site at Newent Glasshouse (Vince, [977] although similar material is present in Hereford City Museum from a kiln site at Whitney-on-Wye (HM Acc No 1975.58/1-11, HM Acc No 2000). The Staffordshire redwares and slipwares from the pit form an interesting group. The red fabric slipware plate (FIG. 9, no. 24) is of a type normally thought to date to the mid-to-late 17th century, being replaced by the more elaborate 'Toft style' slipwares towards the end of the century. The black-glazed red earthenware likewise is more common in 17th than 18th-century contexts (FIG. 10, no. 26). The unstratified three-handled cup (FIG. 10, no. 27) is more likely to date to the earlier 17th century and may not have originated in this group. The feathered decoration found on the slipware dish (FIG. 10, no. 28) is also typical of very early 18th or late-17th-century deposits. The brown stonewares (FIG. 10, nos. 29-31) and the mottled-glazed earthenware (FIG. 10, nos 32-4) are clearly of 18th-century date, although the Queen Anne excise marks would suggest a date very early in the century.

Ceramic Building Material

One hundred and forty eight fragments of tile were submitted for study. With the exception of the possible finial and the ridge tile fragments from period 2 noted above they come from deposits of periods 3 to 5. Fabric B4 ridge tiles first occurred in period 3 but were outnumbered at that time by A7B fragments. In the two later periods this ratio was reversed although the earlier type continued to be found in reasonable quantities. Later ridge tiles, in fabrics B5, A7D and A10 occurred in deposits of periods 4 and 5. The absence of flat roof tiles in these later deposits suggests that stone or other non-ceramic flat roof tiles were used. Two fragments of B4 hearth tiles are of interest since the use of these tiles to form the bases of hearths is rare, having been found only on two other sites, Deens Court and 16-18 High Town (Thomas, forthcoming and Appleton-Fox, forthcoming).

A fragment of Droitwich-type decorated floor tile of later-14th or 15th-century date was found in association with mid-16th-century pottery in a period 3 deposit (572). It could therefore have come onto the site as re-used monastic spoil rather than being evidence for a late medieval decorated floor tile on or near the excavated site.

Only two brick fragments were submitted for study, both from 17th-century deposits of period 4 and both of fabric A10, produced locally from the mid-or-late 16th century.

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FIG. 9 Ceramic material (Scale 1:4)

FIG. 8 Ceramic material (Scale 1:4)

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Catalogue of ceramic material (FIGS. 5-10)

FIG. 5

- Medieval jug, fabric A7B. Decorated with applied clay strips containing hammerscale to give a dark colour. Copper-stained lead glaze. Unstratified.
- Fragment of medieval roof final, fabric A7B. Clear glazed. Pit 629.
- Seventeenth-century two-handled tankard, fabric A7D, Pit 499.
- Seventeenth-century bowl, fabric A7D, Primary fill of pit 499. 4
- Seventeenth-century colander, fabric A7D. Unstratified. 5
- Complete 17th-century chafing dish, fabric A7D. Unstratified. 6
- Complete 17th-century chafing dish, fabric A7D, Unstratified. 7

FIG. 6

- 8 Seventeenth-century chafing dish, fabric A7D. Unstratified.
- Sgraffito-decorated dish, fabric A7E. Late 17th or early 18th century. Unstratified. 0
- Slip-trailed dish, fabric A7E. Paralleled at Newent Glasshouse kiln site (Vince, 1977, No. 17). Late 17th 10 or early 18th century. Pit 570.
- Slip-trailed dish, fabric A7E. Paralleled at Newent Glasshouse kiln site (Vince, 1977, No. 17). Late 17th 11 or early 18th century. Pit 570.

FIG. 7

- Slip-trailed dish, fabric A7E. Late 17th or early 18th century. Pit 570. 12
- Complete chafing dish, fabric B4. Sixteenth century. Unstratified. 13
- Rim of a tripod pipkin, fabric B4. Sooted. Late medieval or early post-medieval. Pit 606. 14
- Two-handled cup, fabric B4. Mottled, dark green copper-stained glaze. Sixteenth century. Unstratified. 15
- Fragment of B4 ridge tile re-used as a counter, gaming piece or lid. Late medieval or early post-medieval. 16 Soil 452.
- 17 Nottingham stoneware tankard. Late 17th century. Pit 580.

FIG. 8

- Tin-glazed bowl decorated in blue. Late 17th or early 18th century. Pit 568. 18
- 19 Tin-glazed bowl decorated in blue. Late 17th or early 18th century. Pit 568.
- Tin-glazed dish decorated in purple over a light blue-tinged glaze. Late 17th or early 18th century, Pit 568. 20

FIG. 9

- 21 Westerwald stoneware tankard with Queen Anne monogram. Early 18th century. Pit 568
- 22 Westerwald stoneware tankard with Queen Anne monogram. Early 18th century. Pit 568.
- Westerwald stoneware drinking jug with Queen Anne monogram. Early 18th century. Pit 568. 23
- Staffordshire redware plate with white slip-trailed decoration. Mid-17th to early 18th century. Pit 568. 24
- 25 Staffordshire redware posset pot with dummy handles. Mid-17th to early 18th century. Pit 568.

FIG. 10

- 26 Staffordshire black-glazed redware chamber pot. Mid-17th to early 18th century. Pit 568.
- Staffordshire black-glazed redware three-handled cup. Late 17th or early 18th century. Unstratified. 27
- Staffordshire slipware dish with internal feathered slip. Late 17th or early 18th century. Pit 568. 28
- Staffordshire brown stoneware tankard with Queen Anne excise mark (also shown at 1:2). Early 18th 29 century. Pit 568.
- 30 Staffordshire brown stoneware tankard with Queen Anne excise mark (also shown at 1:2) Early 18th century. Unstratified.
- 31 Staffordshire brown stoneware coffee cup. Late 17th or early 18th century. Pit 568.
- 32 Staffordshire mottle glazed dish with a single handle. Late 17th or early 18th century. Pit 568.
- 33 Staffordshire mottle glazed chamber pot. Late 17th or early 18th century. Pit 568.
- 34 Staffordshire mottle glazed four-lobed dish. Late 17th or early 18th century. Pit 568.
- 35 Pipeclay wig curler. Late 17th or early 18th century. Pit 415.

Ceramic material (Scale 1:4)



THE ANIMAL BONES by Stephanie Pinter-Bellows

Material and methods

A total of 3,557 animal bones and bone fragments were recovered from the excavation. The majority of the faunal material, 34% each (1,192 and 1,214 fragments respectively), came from the first two periods. Less than one percent of the bone (20 fragments) came from period 3; 11% (408 fragments) from period 4; and 17% (607 fragments) from period 5. Periods 1 and 2 are described together, followed by period 5. A complete report containing measurements and tables of ages and information on all periods forms part of the archive.

Period 1 and 2

The species identified are listed in Table 3. The bulk of the identified bones belong to the domestic mammal species: cattle and sheep/goat, with a smaller number of pig and horse. For sheep and goat, only sheep could be identified from the bones, with goat being identified only from horn-cores. It is likely that the horn-cores were brought in separately for industrial use and all the sheep/goat bones belong to sheep. As cattle have more meat per individual, this would make them the most important food source of the domestic mammals. A larger variety of bird bones was identified from the contexts of period 2 than period 1, besides the chicken and goose bones still found in the largest numbers, duck, pigeon and crow were identified. The duck and pigeon are probably food remains, this is unlikely for the crow. The partial skeletons of cats were found in both periods. In period 1, red deer was represented by six pieces of antler cut offs and waste; and like the goat horn-cores were most probably brought in separately for industrial use. In period 2, part of a coronet and beam from a roe deer and a single proximal phalange from a fallow deer were identified. Also from period 2, from a pit which had soil samples sieved (context 588), the vertebrae of herring and eel were identified. The majority of the unidentified fish bones from the soil samples were ribs and fin rays.

All segments (i.e. head, forelimb, hindlimb, feet) of the cattle, sheep and pig skeletons are represented by the elements examined. The ranges of skeletal elements found within the various contexts are relatively equally distributed throughout, aside from the antler, horn-core, sawn bone and horse bones. Both the period 1 and period 2 assemblages appear to be consistent with unspecialized butchery being carried out in that area.

In both periods, none of the teeth or bones show that any of the pigs lived to adulthood. This is what one would expect from a species which was just used for meat. From the cattle bones which were examined, in period 1, 55% lived until they reached bodily maturity; there are, unfortunately, not enough mandibles and loose teeth to clarify how long they lived after this point. However, similar percentages of adult cattle have been found in the early medieval deposits at Exeter (Maltby, 1979) and Lincoln (O'Connor, 1982); in these cases many of the cattle had been working animals before they were slaughtered for meet. By period 2, a larger percentage were killed in late adolescence, the age for prime meat. At sites previously studied in Hereford between 30% and 50% reached bodily maturity (Noddle, 1985, fig. 93 and Noddle, forthcoming, Table 67). Of the sheep bones, the majority appear to have been killed for the specific purpose of meat. Again, in period 2 the younger sheep were being killed in larger numbers. These percentages are similar to those found elsewhere in Hereford and in the early medieval urban deposits at Exeter and Lincoln.

Industrial waste in the form of horn-cores, antler cut offs, and sawn bone were identified from both periods, sometimes all three from the same context. The horn-cores had been sawn from the skulls, which were not found in the same contexts. The industrial waste found in these contexts may show that bone industries were taking place nearby. However, these particular contexts were among the largest and contained over 50% of the bone, and were therefore more likely to include rare skeletal elements and species. Several of the contexts were also trampled and cobbled areas and so not primary deposits.

Period 5

The species identified from period 5 are listed in Table 3. The bulk of the identified bones belong to the domestic mammal species: cattle and sheep/goat (no goat bones were identified) with a smaller number of pig. One horse bone was recovered. All the bird bones found were from chicken and domestic goose. There are also the bones of a cat.

Of interest from this period are two contexts (470 and 570) within pit complex 568 which contain a large number of sheep skulls and mandibles. Context 570 appears to be the fill of the main rubbish pit for the fairly prosperous occupants of the site in the early years of the 18th century and also contained large amounts of pottery, including German imports, and other material, including leather. While the post-cranial bones from the entire period give a minimum number of 3 individual sheep, there are a minimum of 20 individuals represented by the skulls and mandibles from these contexts. The skulls have been chipped in half sagitally; and one shows several knife marks on the frontal parallel to the eye orbit. Those skulls which had had horn-cores have had them sawn off, but skulls which had horns are in the minority, most are without horn development. The other skeletal elements of the sheep/goat and other species in these contexts are consistent with those of food remains, not industrial use (e.g. there is not also a concentration of feet bones, as would be expected with tannery activity). Study of the epiphyses throughout the period shows 40% of the sheep/goats reaching bodily maturity, all epiphyses fused, approximately 31/2 years; while the profile of the mandibles within pit complex 568 has 60% with third molars at least at wear stage 8, approximately 4 years; however, none of the mandibles belong to elderly individuals. This indicates that sheep/goat in this rubbish pit were slightly older than the others of this period. Neither profile shows any young animals being present, no early fusing epiphyses unfused or mandibles with first or second molars unerupted.

The mandibular age distribution is consistent with that seen for wether (castrated male) sheep. Wethers are often kept for wool production as their wool is thicker. The butchery suggests removal of the brain. Baked sheep heads are found in Greece and Turkey today - the horns are removed before the heads are baked on a tray in a bread-oven, then the heads are eaten as a communal dish with the heads split and the brains

Table 3List of Animal Species

Animal Species	Periods									
		I		2	5					
	N	MNI	N	MNI	N	MNI				
Collected by hand										
Horse (Equus caballus)	5	1			1	1				
Cow (Bos taurus)	63	6	47	4	22	4				
Pig (Sus scrofa)	11	1	18	2	11	2				
Sheep (Ovis aries)	21		8		15					
Goat (Capra hircus)	4									
Sheep/goat*	32	4	24	4	42	20				
Red Deer (Cervus elaphus)	6									
Fallow Deer (Dama dama)			1	1						
Roe Deer			1							
(Capreolus capreolus)										
Cat (Felis sp domestic)	21	2	3	1	4	1				
Domestic foul (Gallus sp)	9	3	10	2	7	2				
Goose (Anser sp)	2	1	8	3	1	1				
Duck (Anas sp)			5	2						
Pigeon (Columba sp)			1	1						
Crow (Corvus corone)			1	1						
Large Artiodactyl					1					
Identifiable Mammal*	727	7	549		344					
Identifiable Bird*	35		68		18					
Unidentified Bird	11		32		14					
Unidentified Mammal	241		220		125					
Unidentified Fish	2		1		2					
Unidentified Animal	2		12							
Collected by sieve										
Rodent			1							
Herring (Clupea harengus)			14							
Eel (Anguilla anguilla)			12							
Unidentified fish			178							
Total Number	1192		1214		607					

N = Number NMI = Minimum number of individuals

•Note - While a selected record was made, in order to be able to calculate the proportion of the bones which were unidentified fragments, a count was kept on the number of identifiable elements.

eaten (pers. comm. Sebastian Payne). The culinary use in England, although rare, was mentioned in 19th-century context, in Mrs. Beeton's *Book of Household Management* (Beeton, 1861). It is, however, likely that younger sheep than these would have been pre-ferred.

REFERENCE

⁺ A selective detailed record was made for the assemblage, with further work done only where it appeared to add substantially to the results. For a full description of the methods used see Davis (1992). All the material was recorded following the AML Osteometry Data Capture Manual (Jones *et al.*, 1979). Dental eruption and attrition date were recorded using the wear stages defined by Grant (1982) for cattle and pig, and the stages defined by Payne (1973; 1987) for sheep/goat. Epiphysial union data follow Silver (1969). Measurements follow von den Driesch (1976) with additions as described in Davis (1992). Withers height were calculated following von den Driesch, A. and Boessneck, J. (1974). Two methods of quantification to estimate the relative importance of the major animal species were used; simply fragments counts (often termed number of identified specimens per taxon) and minimum numbers of individuals (MNI) (following Gilbert and Steinfield, 1977, 333).

THE PLANT REMAINS by Clare de Rouffignac

Introduction

Previous excavations have produced environmental remains of some importance in Hereford (McCutcheon and Hood, 1971; Mitchell 1971), but little analysis of environmental material has been undertaken in recent years. Early sites which were examined for environmental remains are detailed in Shoesmith (1985). More recent environmental remains are in de Rouffignac (forthcoming).

Methods and aims of investigation

Ten samples were collected from various features on site, of which eight were found to contain plant remains. The aims of the investigation were to determine the industrial processes taking place and to identify food plants and plants of the local environment. A 500 μ m mesh was used for recovery of the flots and these were scanned to recover all plant remains (Table 4).

Discussion

The plant remains recovered included both carbonised and uncharred material. Accidental oven fires can occur during drying or malting, and domestic refuse or crop processing waste was deliberately disposed of by burning. Plant remains were sometimes also used as fuel for industrial activities (Green, 1982, 40 and 43).

Uncharred seeds are widespread on archaeological sites, but until recently it was thought that such seeds were modern, and would not survive intact in archaeological deposits. However, radiocarbon dating of uncharred seeds from Saxon pits at Deansway, Worcester, has shown that the seeds were contemporary with the deposits (Lisa Moffett pers. comm.). It is therefore likely that the uncharred seeds from these excavations represent plants of the contemporary local environment. The species recovered were those commonly found where human disturbance has taken place, such as *Sambucus nigra* (elder),

Table 4 Plant Remains recovered from samples

Period	1	1	la	la	2	3	4	5
Context	714	739	695	710	617	588	648	465
Cereals								
Hordeum vulgare (barley)						1		
T aestivum/compactum (bread/club wheat)			11					
Wheat/rye	1		36					
Avena sp. (oats)			3				-	
Avena sp. (chaff)			3					
Cereal embryos			24					
Cereal indeterminate		36	40	1	1	3		35
Caprifoliaceae								
Sambucus nigra (elder)		5			1	3		6
Caryophyllaceae								
Spergula arvensis (corn spurrey)						1		
cf Caryophyllaceae			1	-				
Chenopodiaceae								
Chenopodium album (fat hen)							1	
Chenopodium sp. (fat hen type)			9				1	
Compositae								
Lapsana communis (nipplewort)			1					
Chrysanthemum segitum (corn marigold)		1	4					
Anthemis cotula (stinking mayweed)		1	15					-
Centaurea cyanus (cornflower)			1	-			1	-
cf Compositae			1					
Cyperaceae								
Eleocharis palustris/uniglumis (rush)					1			
Carex spp. (sedges)				-	4			
Gramineae					-			
Gramineae (grasses)			1			4		
Culm fragments			2			>100		
Leguminosae								
Vicia sativa subsp. niera (common vetch)			1					
Vicia/Lathyrus sn. (bean/yetch)			7			2		2
cf Medicago sp. (medick)						-		2
Tri olium/Medicago sp. (clover/medick)			8					
Moraceae						-		
Ficus caria (fig)					-	12		
Polyvonaceae						12		
Rumex acetosa (sheep's sorrel)			2					
Rumex sp. (dock type)			-		7			
cf Polyponaceae								1
Rosaceae								
Rubus fruticosus agg (bramble)	1	6			6			4
Fragaria vesca (wild strawherry)		3			3	12		-
Solanaceae		-				1.0		
Brassica sp. (cabbage type)	4		-					
Indeterminate seeds	4		>200	4				>100

uncharred seeds are in *italic* type

Rumex spp. (docks), and *Rubus fruticosus* agg (bramble). Elder, as well as having edible fruit, probably grew around buildings and yards and is one of the commonest species recovered due to its durable seeds which are over-represented in the archaeological record (Hall *et al* 1983, 216).

No mineralised remains were recovered. This suggests that the features which were sampled did not contain primary faecal deposits, although they may have functioned as cess-pits prior to their final use.

Interpretation of urban medieval deposits can be problematic because of the large numbers of intercutting pits. The pits would have been used for refuse including food waste and burnt remains from hearths and ovens. As pit digging takes place, material is cast up and redeposited constantly (Jones, 1985, 111). Constant turning over of soil would also lead to rapid decay of biological remains, apart from charcoal which shows little signs of decay.

This probably accounts for the low concentrations of plant remains in some of the pits. Despite this there were some plant remains of note.

Period 1b

The most productive sample was from the thin layer of charcoal and ash (695) over the flagged floor 694. As well as three species of cereal, eleven weed species were recovered. The cereals were *T* aestivum/compactum (bread/club wheat), avena sp. (oats), and wheat/rye. Most of the cereal seeds had sprouted; some embryos had become detached, but many more were still adhering to the grains. The preservation of oat chaff was exceptional. This suggests that the charred remains had not been transported a long distance, as chaff is very fragile and could easily have become broken during processing and transport. Oats were grown as a fodder crop for animals, but sometimes persisted as a weed of other cereal crops (Greig, 1991, 323).

The presence of *Chrysanthemum segitum* (corn marigold) and *Spergula arvensis* (corn spurrey), which grow on light, sandy soils, and *Anthemis cotula* (stinking mayweed), a plant of heavy clay soils, suggest cultivation was taking place on at least two different soil types. Nitrophilous species were also common, including *Chenopodium* sp. (fat hen type), *VicialLathyrus* spp. (bean/vetcher), and *Trifolium/Medicago* sp. (clover/medick). These weeds may have been encouraged to grow as a result of midden material being used on the fields as fertiliser for cereal crops.

An interesting specimen was *Centaurea cyanus* (cornflower) which is today found mostly as a garden flower as improved crop processing and use of herbicides have removed it as a weed of cultivation.

The cereal seeds were all large healthy grains, and therefore do not represent 'tailings' from a fully processed crop. The presence both of different cereals and of different weed seeds implies combining of crops. The weed seeds were all very small, and would not have been removed by winnowing or sieving. The most probable explanation for the material is that it represents a combination of crops which were processed as far as sieving and

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winnowing, but were then stored in bulk. The grain would then have been hand-cleaned to remove the weed seeds when required for milling.

The cereal grains then sprouted for some reason. Malt for brewing is produced by sprouting cereal grains in a warm damp atmosphere in an oven or kiln. There is the possibility of burning if the temperature accidentally becomes too high, with subsequent charring of the grains. The other explanation is that damp grain was being dried in an oven before milling and the grains started sprouting before drying was completed. There would have been no alternative at this point other than to get rid of the grain.

Period 2

The presence of uncharred seeds of *Carex* spp. (sedges) from 617 (fill of pit 603) may suggest that the area was very damp, as these species are normally found on damp or marshy ground. The sample also contained a single seed of *Eleocharis palustrislunglumis* (spike-rush). This species produces rhizomes and spreads rapidly in disturbed and ploughed soils (Lisa Moffett pers. comm.). It is often found from medieval deposits and was a common weed of agricultural fields.

Period 3

The sample from 588 (fill of pit 606) contained large numbers of charred grass culm fragments. This probably represents bedding or floor covering which was burnt after use before disposal in the pit. In the same deposit, there were some uncharred seeds of *Ficus cariac* (fig) and *Fragaria vesca* (wild strawberry). These are both edible fruits, with the seeds representing food waste. The presence of fig is significant as it is an imported Mediterranean species. Fig seeds were also found in samples collected from the later Saxon town ditch (de Rouffignac, forthcoming), and from Berrington Street in the post-medieval period (Williams, 1985, 98). Imported figs have been found in many other parts of the country, including evidence of dried figs from medieval Norwich (Murphy, 1983, 41).

Strawberries were mainly wild rather than cultivated plants until the introduction of hybrid American and French plants in the 16th century. However, wild strawberries, also found in the Saxon town ditch were very popular (Williams, 1985, 98). These fruits were recorded as being sold in London during the 15th century (McLean, 1989, 238).

Period 4

Samples were also collected and examined to determine what industrial processes were taking place. Material from the gully (fill 648, cut 652) represents lime-burning debris. Similar evidence of lime-burning was identified from Deansway, Worcester; it is the main process for production of mortar (Marsden, 1991). Lime is also used for agricultural purposes, but coming from a site in the city, it seems more likely that the material represents waste from mortar production. The deposit (684) from beneath the gully probably represents liquid sewage which has seeped down from a soakaway or drain. A similar

situation was noted during excavations at Deansway, Worcester, where gullies behind tenement buildings were found to have cess-pit material present (Robin Jackson pers. comm.). The lack of mineralised remains is unsurprising as only liquid sewage would have filtered through into the deposits beneath. The use of the gully for dumping lime-burning residues is therefore a secondary rather than a primary use.

OTHER FINDS

Many iron nails were retrieved, from all periods. Two fragments of cramps, a possible blade and several unidentified lumps of iron were retrieved from period 5. The only other metal objects were two small lumps of copper alloy from pit 628 (fill 627) and layer 596.

Roofing material, in the form of stone tiles made of local sandstone, was recovered from contexts of period 3 onwards. Its total absence in periods 1 and 2 may indicate that its use before the 13th century was restricted to high status buildings, perhaps for reasons of cost.

Fragments of clay pipe stems were retrieved from five period 4 contexts. Many period 5 contexts produced stems and four contexts had bowls. With one exception the bowls are of types H, J and K, and the marks of two makers (RE and WC) were found (Peacey, 1985, microfiche M8.A6-B5). These span the period from 1620 to 1720. One example of a bowl decorated with a fluted design, similar to type V (1820-70) was also recovered.

With the exception of one fragment of intrusive glass from a period 4 context (468) all glass was from period 5. The majority consisted of non-diagnostic body sherds of wine bottles, though several base, rim and neck fragments of types already published were also found (Boulton, 1985). Fragments of two vessels of clear glass (461 and 570) and part of a clear bottle stopper (570) were the only indication of finer vessels, all derived from pit complex 568. A small quantity of contemporary window glass was also recovered from period 5.

Small quantities of slag were recovered from 35 contexts, spread over all periods. As none of these were *in situ* industrial deposits and no individual context produced large quantities, analysis was not undertaken.

Leather fragments from as least eight shoes were retrieved from fill 570 of pit 568. The fragments were generally not large but two complete soles with pointed toes were recovered. A wooden mule heel of 17th or 18th-century type was also found in association with this deposit. Four fragments, from two shoes, from an unstratified context, were of similar form,

DISCUSSION

Periods 1a and 1b - Before the 13th century

The lowest soil layer is the natural accumulation that pre-dated the foundation of the market-place in the late 11th century. It produced no evidence of extra-mural cultiva-

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tion. No deposits could be securely dated to the 11th century and the stratigraphy indicates that there was little or no occupation until the latter part of the century, though the earliest assemblages of pottery suggest that occupation probably began shortly before the 12th century. This probably reflects the use of this area as part of the newly-established Norman market-place. The main focus of the market seems to have been in the area of High Town, so this eastern part may have been used initially only on a casual basis, with temporary stalls in an otherwise open area.

In the early 12th century the area became intensively occupied. The fragmentary remains of a cobbled surface at the S. may be a former road or market surface. The pits and post-holes to the N. of this probably reflect the temporary structures in this new market. Only one of the post-holes could have held a major timber from a building, but the extensive burnt layer shows that buildings in this area were destroyed by fire.

The construction of a building with stone foundations later in the century indicates the increasingly permanent nature of the settlement in this area. It continued to be used into the 13th century and the sunken area within it was used, at leas on occasion, for the storage of grain. Although there was no direct evidence for the use of this building, the animal remains suggest that unspecialized butchery was being undertaken. Waste bone was also abundant suggesting that other bone industries were practised in the vicinity. The storage of mixed grain was localised and may have been only once occurrence. This cannot therefore be seen as a major use of the site, but simply a domestic incident.

The evidence surely reflects the commercial activity of this area, with bone-working trades being located close to the place of butchery as an associated by-product. However, it is not possible, from such a limited excavation, to determine whether the whole of this part of the market was used for butchery and allied trades, or whether individual sites had varied uses.

If the cobbled surface was part of a road, it is possible that the line of Union Street may have been defined as early as the 12th century, despite the lack of documentation until the early 17th century.

Period 2 - 13th century

During the 13th century the land use appears to have changed. The period 1b building was demolished and the stone surface at the S. of the site was the main structural feature of this period. Besides this, the bulk of the features consist of pits. Although several layers of occupation debris were present, there were no clearly defined surfaces.

At the N. of the area excavated were the first of a long-lived line of features which may lie just to the S. of a property boundary. The earliest of these was a gully, which may have been the original boundary. The soakaway which cut it would then be at the rear of a property. It is suggested that by this time the market area was being infilled, and the two frontages - Commercial Street and Union Street - had been formed, with this line of features representing the junction between the two. The continuation of unspecialized butchery suggests that, although there may have been redevelopment on the site the nature of the activities undertaken did not alter.

Period 3 - 14th century to the mid-16th century

The site continued to be an open area. The continuity of the presence of features, mainly posts and linear features, at the extreme northern end of trench A suggests that it was a boundary between two different land uses, perhaps even between two properties, one fronting Commercial Street, the other fronting Union Street. Conversely, the short fence line at the E. of trench A is likely to be no more than a temporary division within one property, the rubbish pits in the northern part of the site being to the rear of any building on the Union Street frontage. No structural remains were found on this frontage, but the general absence of features in this area may be interpreted as indicating that the excavated area was entirely within a building. The small quantity of bone and the absence of evidence for butchery probably reflects the end of this industry on the sit. Taylor's Map of 1757 marks 'The Butchery,' which includes the Old House, at the E. of High Town. It is possible that this had been established as a specialized area for butchery by this time, taking over the function from other areas of the town.

Period 4 - Late 16th and 17th centuries

By the post-medieval period the land use had changed from domestic/commercial to become more industrial. Evidence of industrial processes on the site included the oven, the pit for the storage of liquid and, towards the southern end of the site, the lime-filled gully. Associated with this change was an increase in the quantity of buildings on the site, particularly the backland. The use of some areas for pits continued.

Period 5 - From the 18th century

The area continued to become increasingly built-up, with pits in the open areas. Taylor's Map in 1757 shows that by this date there was a building on the Union Street frontage. The few features in this part of the site were therefore presumably within the building.

On the backland, the well midway between the two frontages was in use until this period and pits continued to be dug into the 19th century. Two of them produced large assemblages of 18th-century pottery, including several forms not previously represented in Hereford. Furthermore, it included evidence interpreted as the culinary use of sheep's brains, apparently unparalleled in Britain.

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Excavation at the Buttercross, Leominster, Herefordshire

By J. D. HURST, E. A. PEARSON and S. RATKAI with contributions by F. ROE, and T. FINNEY. Illustrations by L. TEMPLETON

SUMMARY

E xcavation at the Buttercross in Leominster has revealed a sequence of deposits dating from the 12th century onwards. This date correlated well chronologically with the earliest documentary evidence for the development of commercial activity in Leominster with the granting of a fair in 1170.

The site was situated within plots fronting onto the High Street and possibly Burgess Street. The excavation revealed that up to the 15th century this area was not intensively used, but was used for cooking (domestic ovens), and some rubbish disposal. The presence of ironworking waste in some of the pits indicated that a blacksmith was working in the vicinity in the 13/14th century.

About the late 15th century stone structures were erected, including two cellars, and a stone-lined latrine. Other contemporary stone walls were probably stub walls for timberframed buildings. This suggested considerable late medieval building development in the town. Associated pottery included a high percentage of Malvernian ware, indicating a strong trade link with Worcestershire in this period.

The excavation was focused on medieval deposits, and so less detail is available for the post-medieval period. However, it is clear that some of the later medieval structures fell out of use during the 17th to 18th century. In the mid-19th century several properties were combined, and any earlier structures demolished to make way for a large market hall.

INTRODUCTION

The early history of settlement at Leominster is centred around the 7th-century foundation of a religious house. By the period of *Domesday Book* there was a large and wealthy manor beside the religious house. A Benedictine priory was founded here in the 12th century, and it is likely that the town developed, at least initially, around services to the priory. By the early 13th century Leominster was a borough (Brown and Wilson, 1994), and the town is likely to have developed by this date. The economic history of the town has been dominated by trade in wool from the surrounding district in the medieval period, and by glove manufacture in the post-medieval period.

The site was located on the W. side of the High Street at the Buttercross (SO 49605910; HWCM 7044; FIGS. 1 and 2), and was excavated in advance of redevelopment in 1991.

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FIG. 1 Location of the site (HWCM 7044)

Crown copywright

Leominster District Council (the site owner) and Harpers (the developer) assisted with financial support during the excavation, and post-excavation research and publication were funded by English Heritage.

BACKGROUND

Reasons for the project

The results of evaluation (Woodiwiss, 1990) were used to design the new development in order that preservation in situ was achieved for a substantial portion of the archaeological remains, and to make provision for the archaeological recording where the extension of an existing basement area and the insertion of new foundations would affect archaeological deposits. This approach was in accordance with PPG16 (Department of the Environment 1990).

Geology and soils

The site is situated on Till overlying Raglan Mudstone Formation (mudstone and sandstone of the Silurian Old Red Sandstone; British Geological Survey sheet 198 solid and drift geology 1:50,000). The soils in the area are typical argillic brown earths of the Escrick 1 and Bromyard Associations (Soil Survey or England and Wales 1993; Ragg et al 1984, 184-8 and 124-7).

Archaeological background

Archaeological sites recorded in the area include a possible prehistoric barrow c. 200 m. to the W. of the site (HWCM 9301), and a possible tessellated pavement of Roman date to the rear of 28 Burgess Street (HWCM 8912). Medieval finds have been recorded on Bridge Street (HWCM 3598) and in Corn Square (HWCM 19585), and there has been an archaeological survey and limited excavation work at the Old Priory and in Pinsley Mead (HWCM 721 and 725 respectively; Brown and Wilson, 1994). One 14th-century building survives in Burgess Street (HWCM 8840), and immediately adjacent to the site to the S. there is a medieval building with surviving 16th-century components (Royal Commission on Historical Monuments England, (1934), 121).

Although a certain amount of work has been done on cartographic sources, analysis of evidence for the medieval town plan of Leominster has also been limited (Buteux. 1995). There have been historical and archaeological studies of Leominster Priory (respectively Kemp, 1988, and Brown and Wilson, 1994), but the archaeological potential of the town has not been explored in detail by excavation.

General historical background

Secondary sources include several early histories of Leominster dating from the 18th century onwards (e.g. Price, 1795; Williams, 1808), and more recent work (e.g. Reeves, 1973). More recently the historical origins and significance of Leominster have been the

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subject of research, largely in terms of the origins and nature of the pre-Conquest ecclesiastical centre (Hillaby, 1987). Leominster Priory has also been the subject of historical study (Kemp, 1988).

General historical works provide little information that can be identified to the area of the site. The only reference noted for the High Street was very general, and recorded that in the 16th century the High Street was paved (in 1556; Townsend, 1863). A 1393 listing, which includes street names, cites a Burgess Lane which can be identified with the present Burgess Street (Price, 1795 in Buteux, 1995).

The market hall which was built by John Abel was situated in the road at the N. end of the High Street, opposite the site of the excavation. This building was erected in 1633, and there is a reference to the removal of heavy roofing (probably stone) tiles in 1793 and a replacement roof of slate (Williams, 1808). Locally this building was called the Cross (*Ibid.* 90). An early reference to Crosse House is dated 1561, and this suggests that there was a precursor to the Buttercross built by Abel (Townsend, 1863), 72), and so the 17thcentury building may have replaced an earlier structure possibly in the same position. The town hall was moved from the Court House (Frere Chamber) in Church Street to above the market hall in 1750 (Malpas *et al* 1993, 6). Price (1795) and Williams (1808) both mention the market at the Buttercross. In the later 18th century the selling of earthenware in addition to butter seems to have taken place here (Blacklock, 1898).

METHODS

Excavation strategy

The area of the excavation was limited to the extension of the 19th-century cellared area on the E. side of the site. This area was stripped by mechanical excavator to the top of late-medieval levels (the medieval deposits being the focus of the excavation (County Archaeological Service 1990a and 1990b)), and these were then excavated by hand down to natural deposits. Walls and concrete piers were left *in situ*. A total of over 90 m² was excavated (an area of *c*. 9.5 x 9.5 m; FIG. 2). A watching brief was held on deep foundations elsewhere on the site.

Post-fieldwork analysis

Following assessment (County Archaeological Service, 1994; English Heritage, 1991) post-excavation was focused in particular on the pottery, though the quality of selected environmental remains was also so good in the case of some types of material (especially seeds), that it has been possible to include this an another major area of research. Detailed research objectives are described in archive (County Archaeological Service, 1996).

Documentary analysis

A summary listing was produced of relevant primary sources for the Burgess Street and Buttercross area (including published transcripts) available at the H.R.O. In addition,



FIG. 2 Location of evaluation trenches and excavation (HWCM 7044)

secondary sources were also consulted, and reference made to research already carried out by the Central Marches Historic Towns Project (Buteux, 1995).

HISTORICAL EVIDENCE RELATING TO THE SITE

Stamper (1995) has pointed out that primary historical records are generally poor for medieval Leominster, but that they improve from the 18th century.

Deeds for the High Street and Burgess Street were examined at the Herefordshire Record Office as part of this project. The available property deeds make it clear that the High Street in the 18th century was home to a variety of different crafts. Some documentary information about the area of the excavation was gleaned from house deeds available for properties on the W. side of the N. end of the High Street, though the extraction of information about the area of the site was not straightforward as properties in this period were not clearly differentiated by name or number.

Assuming that the Bank of Leominster was in the same position in 1789 as the Leominster Savings Bank in 1853 then one set of deeds provides information about adjacent properties. Comparing a plan in Malpas *et al* (1993, 9), and the 1832 and 1887 maps, it can be shown that the property to the S. of the bank would be 2 High Street (still standing as a grill bar next to the 1991 development). The deeds can then be used to provide the following order from S. to N:
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house (Royal Oak)

house (=2 High Street; HWCM 8846)

Bank of Leominster

house

house (belonging to Wm. Seward)

The three most northerly properties were the plots developed in 1991.

This interpretation seems likely as 2 High Street was in the mid-19th century in the ownership of Francis Davis, who may have been a descendent of Philip Davis who owned the property described in the 1789 deed. The Royal Oak was a dwelling house in 1789, but was presumably a former inn. Other deeds (e.g. H.R.O. AA32/52) reveal that 2 High Street continued as a chemist's shop until at least 1873.

The later history of the Buttercross area of Leominster has been investigated by Malpas *et al* (1993), who have outlined the following sequence of development affecting the area of the excavation. In 1853 Leominster Borough Council obtained a special Act of Parliament in order to build a bigger market, and to levy tolls. This was a major civic enterprise as the Act of Parliament was purchased at a cost of over £1,000, while the purchase of property cost over £2,000 in addition, the Act only allowing for compulsory purchase. The old town hall was sold to the local M. P. who allowed it to be rebuilt on a new site. Development then started in 1855 on the new location for both the town hall and the butter market, with the council chamber being at first-floor level, and the market beneath extending over the rest of the plot (Malpas *et al*, 1993). This complex occupied the whole of the area affected by the library and retail development built in 1991. The market subsequently became a factory, and later still a warehouse, being demolished in 1975, and finally cleared in 1984 (Malpas et al, 1993). The cellars, which had once been used as a cold store for the market, remained intact, although partly backfilled. Demolition of the town hall commenced in 1974.

The earliest large-scale map which is accurate is the Ordnance Survey 1887 map, and this shows the new market hall. An earlier large-scale map by Gallier dated 1832 seemed to be less accurate, and there were considerable problems in comparing this with the more modern map.

No historical documentation was identified for the part of Burgess Street involved in the 1991 development.

THE EXCAVATION

Machine clearance of the site removed most of the post-medieval deposits, and so only remnants of this period survive where features were particularly deep. The record for post-medieval remains was partial, and this period (phases 3 and 4) is only described in brief below.

PHASE I (12TH TO (?EARLY) 15TH CENTURY; FIGS. 3 AND 5)

This phase largely comprised pits, but there were also ovens. It has a broad date range on the basis that the nature of activity during this phase was consistent over a long period, while the extent of later disturbance and broadness of pottery dating made the insertion of any narrower phasing impractical. However, some pits were early in this sequence (see below).

Pits and post-holes (CG2, 3, 4, 5, 7, 9, 10, 11, 12, 15, 16, 17, 20, 22, 23, 68)

Pits occurred across the whole site. Some were large (CG7, 9, 16, 17), and others seemed most likely to be post-holes (CG2, 3, 22). Stratigraphically CG2 and 3 are some of the earliest features on the site and their similar character suggests that they are related as part of a boundary. There were also some pits which are either of 12th-century (CG11) or 12th/13th-century (CG10, 22) date, and these occurred on the S. side of the site.

Two (late) 13th-century pits (CG5, 17) are the earliest containing hammerscale, and several pits (e.g. CG7, 9) with a slightly later *terminus post quem* (tpq) date of 14/15th century also contained slag. In one case (CG9) this material was concentrated at the base of the pit and seemed to represent a single episode of dumping of rubbish from iron smithing.

In general these pits are likely to have been excavated at least partially as rubbish pits, but it is also likely that they may also have functioned as quarry pits for clay for features such as the ovens.

Ovens (CG21, 34)

One shallow circular pit was filled with clay loam and overlaid with siltstone which was burnt on top (CG21). Loose siltstone lying on the burnt floor suggested that there had been a stone superstructure. It had an overall diameter of 1.70 m. It was not sampled and its specific use remained uncertain.

The centre of an area of stone rubble (CG34) was overlaid with a circular area of charcoal (0.90 m. dia) suggesting that there was a stone superstructure of which only the base had survived. This structure had a clay base which was set in a shallow pit. The structure had an overall diameter of 1.60 m.

There was charred grain and hammerscale in a sample from CG34. The grain could have been incorporated as a fuel element, while hammerscale was found in many contexts in this phase, and so was unlikely to indicate the function of this structure.

Layers (CG6, 8, 13, 19, 67)

These were layers of silty loam and clay.

Artefactual evidence

There were few finds other than pottery sherds from this phase, siltstone tempered ware predominating. There was a small amount of both stone and ceramic roof tiles, but



Key to excavation plans

- ---- Edge of excavated area ----- Edge of trench within excavated area - Top edge of archaeological feature ---- Line of truncation by later activity
- Suggested line of archaeological feature
- 115 Charcoal
 - Surviving archaeological surface
 - Areas truncated by later activity



FIG. 4 Phase 2 features

FIG. 3 Phase 1 features

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the extent of this type of roofing in preference to thatching remained unclear. Iron objects, mainly nails, generally came from context groups associated with metal-working residues, and so there was a possibility that they also represent waste from this activity. Other than nails, few objects could be identified.

Environmental evidence

There was some evidence for domestic waste from food preparation, including fish and cereals.

PHASE 2 (15TH TO 16TH CENTURY; FIGS. 4 AND 5)

Layers accumulated in this phase sealing the pits of the previous phase. Many of these layers contained abundant laminated siltstone, as used especially for roofing tile, and so these layers may be representative of a major period of construction. New buildings were erected on the site, the main structures being a cellar, and cess-pit, both constructed of stone. These are likely to mark an extension backwards of buildings fronting on the main street.

The watching brief during the excavation of deep foundations did not reveal any further building foundations on the W. side of the site that might be attributable to this period, though conditions did not allow any firm conclusions to be drawn about this.

Cellars (CG35, 46)

A cellar (CG35; PLS. XX and XXI) was built of dry rubble stone walling, its construction being associated with a 14/15th-century *tpq*. A second stone-built cellar (CG46; PL XXII) was just visible in the N.W. corner of the site.

Latrine (CG36)

A stone-lined rectangular pit with a 16th-century tpq for its construction.

Other walls (CG30, 31, 39, 51, 56, 70, 72)

Two walls in the N.E. corner of the excavation area (CG31 and 30; PL. XXI) were at right angles to each other, but of different styles of construction, the former using pitched coursing, and the latter flat coursing. These may be boundary walls. Both walls were about 0.30 m. in width. Another wall of similar dimensions (CG39) had a green sandstone base, but was otherwise built of siltstone in flat courses. Other walls (CG51 and 56) were connected with the cellar (CG35), but only short lengths of these walls were present on the site. They were possibly stub walls for a timber-framed building. Stone walls were also recorded during the evaluation (i.e. CG70, 72).

Hearth (CG53)

This structure was observed only in section and so was not securely stratified. In the absence of floor levels associated with the stone buildings elsewhere on the site, it seemed





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likely that this hearth belonged to the stone building sequence of phase 2. It was constructed from siltstone set on edge and bedded in clay. The upper surface was burnt.

Pits and post-holes (CG28, 37, 40, 41, 43, 44, 50, 54, 55, 59)

There were several likely cess-pits (in particular CG44, 54). Other pits (CG43 and 44) contained plenty of animal bone showing that disposal of rubbish in pits continued into the 15th century. There were possible scaffolding holes (CG28, 40) that may have been associated with walls CG51 and CG39 respectively).

Surface (CG71)

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There was an area of abundant pebbles at the N. end of Trench 2.

Layers (CG24, 25, 27, 29, 32, 33, 38, 42, 45, 48, 49, 52, 58, 69)

A number of layers (CG24, 25, 26, 27, 52, 69) at the beginning of this phase were associated with substantial quantities of siltstone.

Artefactual evidence

The use of stone roofing tile was very common in this phase, while ceramic roof tile was largely restricted to ridge tiles (e.g. CG55) except for a small amount of flat ceramic roof tile (CG58).

Iron nails were a common find especially in pit fill CG43, but there were also other iron objects, and a variety of copper alloy objects. Ironworking residues were found in small quantities (e.g. in the fill to pit CG43), generally in the area where it occurred in the previous phase, and so it is likely to be residual in this phase.

Environmental evidence

In the case of some pits there was good environmental evidence that they had been used at cess-pits (CG44, 54), while other parts of the site contained general domestic waste, probably derived from food preparation. There was a variety of cereal types, and they had largely been processed away from the site, and probably outside the town. A wide range of fruits was evidenced from the cess-pits.

PHASE 3 (17TH TO MID-19TH CENTURY; FIG. 6)

All floor levels associated with this phase were removed by machine during clearance, and so only some deposits from deeper features survived.

Cellar (CG35) disuse

This was associated with a 17th-century tpq.



FIG. 6 Phase 3 features.

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Cellar (CG46) disuse

After being relined in brick (CG47) which coincided with the insertion of a brickbuilt oven, this cellar was finally infilled (*tpq* of 19th century).

Cess-pit (CG36) disuse

This was associated with an 18th-century tpq.

Brick drain (CG60)

A T-shaped length of brick-built drain associated with a tpq of 18/19th century for disuse.

Pits (CG62, 65, 74)

A small rubbish pit (CG62) contained a whole glass bottle, clay pipe, and a good group of 17th-century pottery.

Layers (*CG*64, 73)

The layers had a range of dates from 14/15th to 18/19th century, and were often associated with ash or charcoal.

Artefactual evidence

Other than pottery the most common find of this phase was clay pipe. Brick was definitely present during this phase (the earliest incidence of brick having a *tpq* of 17th century), as was ceramic flat roof tile. Metal finds were not common, and included an iron wall hook (CG35) and a large copper alloy pin (CG65). Other types of find represented in this phase were window and bottle glass, and coal.

PHASE 4 (MID-19TH TO 20TH CENTURY)

This phase comprised mainly the market hall built in 1855.

Market Hall (CG66)

This comprised a substantial concrete floor supported on large concrete and stone piers with associated pipework. There was a stone-built cellar to the E. of the excavated area.

Machine trench (CG63, 76)

There was a large T-shaped trench (CG63), which was a contractor's test pit. The site was machine cleared (CG76) down to the top of medieval deposits in 1991 as part of the excavation reported here.

THE FINDS

Artefact recovery policy

All artefacts were recovered during excavation except for stone roof tile which was sampled. For a more detailed account of the artefact recovery policy see archive.

Methods of analysis (general)

All find were quantified by count (with the exception of metal-working residues), and dated, where possible. The metal-working residues were quantified by weight.

POTTERY by S. RATKAI

Method of analysis

A programme of thin sectioning was undertaken on the pottery from Buttercross, in consultation with Dr. Vince. Thin sections were then prepared by Dr. Williams at Southampton University and a report produced. Dr. Vince then examined the thin sections and integrated them into his previous work. Both reports are available in an edited version (County Archaeological Service, 1996), and in full in archive.

All the pottery from medieval contexts was examined under x20 magnification and compared with the County type series (Hurst and Rees, 1992), and with the sherds which had been thin sectioned. Medieval pottery from post-medieval contexts was examined macroscopically, and was recorded in detail. The remaining pottery was not divided into fabric types but was simply classed as fabric 99 (a general medieval category), and the only other recording was sherd number, and weight. The post-medieval pottery was spot dated but recorded only as fabric 100, a general post-medieval category.

Results

The site assemblage comprised 1335 sherds (848 medieval and 487 post-medieval sherds; Tables 1-2). Analysis of this assemblage resulted in the addition of the following five fabrics to the County fabric type series (Hurst and Rees, 1992):

Fabric 134	Hereford fabric A7B
Manufacture	Wheel-thrown
Hardness	A fine hard smooth ware
Colour	Surfaces and margins are orange or brown. The core is grey.
Inclusions	This is a fine ware with few visible inclusions. The matrix contains sparse
	irregular voids up to 0.25 mm., sparse mica, sparse rounded white
	?argillaceous inclusions (0.25-0.5 mm.), sparse angular quartz grains
	(0.25 mm.), sparse sandstone up to 0.5 mm. and sparse brown pellets
	(0.1-3 mm.).
Source	Hereford (Vince, 1985)
Period	Medieval

Fabric	U/S	Phase 1	Phase 2	Phase 3	Phase 4	Grand Total
55	0%	1%	0%	0%	0%	0%
56	1%	11%	1%	0%	0%	2%
57	0%	0%	0%	0%	0%	0%
60	0%	3%	1%	0%	0%	1%
64	0%	2%	0%	0%	0%	0%
66	2%	15%	24%	1%	0%	12%
69	1%	5%	31%	0%	63%	12%
70	3%	0%	4%	0%	13%	2%
72	2%	0%	3%	8%	13%	5%
92	0%	7%	14%	1%	0%	6%
99	49%	0%	0%	7%	0%	7%
100	40%	0%	0%	80%	13%	36%
111	2%	31%	6%	0%	0%	7%
120	0%	1%	0%	0%	0%	0%
132	1%	19%	0%	0%	0%	3%
134	0%	4%	5%	0%	0%	2%
135	0%	3%	10%	0%	0%	4%
136	0%	0%	0%	0%	0%	0%
137	0%	0%	0%	0%	0%	0%
138	0%	0%	0%	0%	0%	0%
Grand Total	100%	100%	100%	100%	100%	100%

Table 1. Percentages of pottery fabric types by sherd number

Fabric 135	Highly micaceous ware
Manufacture	Wheel-thrown
Hardness	The fabric is hard and slightly rough to the touch.
Colour	The surfaces and margins are orange-brown to pale brown. The core is mid-grey.
Inclusions	The inclusions consist of abundant golden mica, moderate siltstone (0. 25 mm.), moderate sandstone (0.25-0.5 mm.), and very sparse subangular quartz (0.25-0.5 mm.). In addition there are moderate rounded cream inclusions (0, 25 mm.).
Source	North Herefordshire/south Shropshire
Period	Medieval
Fabric 136	?Shropshire white ware
Manufacture	?Wheel-thrown
Hardness Colour	It was hard fired and slightly rough to the touch. This was a relatively iron-free clay, which had fired to a very pale grey with darker grey or buff surfaces.

Fabric	U/S	Phase 1	Phase 2	Phase 3	Phase 4	Grand Total
55	0%	0%	0%	0%	0%	0%
56	3%	16%	1%	0%	0%	3%
57	0%	0%	0%	0%	0%	0%
60	0%	3%	1%	0%	0%	1%
64	0%	2%	0%	0%	0%	0%
66	4%	11%	27%	0%	0%	11%
69	3%	2%	43%	0%	88%	16%
70	0%	0%	1%	0%	4%	0%
72	6%	0%	1%	2%	4%	2%
92	0%	6%	10%	1%	0%	5%
99	43%	0%	0%	5%	0%	6%
100	40%	0%	0%	91%	3%	44%
111	0%	23%	3%	· 0%	0%	4%
120	0%	0%	0%	0%	0%	0%
132	1%	27%	0%	0%	0%	3%
134	0%	9%	5%	0%	0%	3%
135	0%	1%	9%	0%	0%	3%
136	0%	0%	0%	0%	0%	0%
137	0%	0%	0%	0%	0%	0%
138	0%	0%	0%	0%	0%	0%
Grand Total	100%	100%	100%	100%	100%	100%

Table 2. Percentages of pottery fabric types by sherd weight

Inclusions	Inclusions consisted of abundant subangular grey quartz (0.25-0.5 mm.), sparse rounded siltstone (0.5-1 mm.), sparse rounded, soft, cream ?argillaceous material (0.25-0.5 mm.) and moderate, rounded, red and black grainy ferruginous material of variable size up to 0.5 mm.
Source	?Shropshire
Period	Medieval
Fabric 137	Orange sandy ware
Manufacture	Wheel-thrown
Hardness	Hard
Colour	Pale orange to pale pink-orange surfaces and margins and a buff core.
Inclusions	The inclusions were made up of moderate amounts of sub-rounded quartz (c. 0. 25 mm.), sparse organic inclusions (or voids caused by their burning out), sparse rounded red or red-brown (?ferruginous) material (0.25-0.75 mm.), and sparse rounded purplish-red material (?haematite).
Source	Unknown
Period	Medieval

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Fabric 138	
Manufacture	Wheel-thrown
Hardness	Hard fired
Colour	The core is pale orange, the margins pale orange or pale-mid grey and the surfaces brown.
Inclusions	The clay matrix contained moderate, angular, poorly sorted quartz (0.25- 0.5 mm.), moderate sub-rounded red ferruginous inclusions of up to 1 mm., sparse irregular voids (<0.25 mm.), and sparse, hard, rounded off- white inclusions (0.25-0.5 mm.). The latter inclusion appears to be the same material that is often seen in Cistercian wares and is especially apparent beneath the glaze.
Source	West Midlands
Period	Medieval

Petrology

It was possible to tie in the thin sections with the existing County Type Series. In effect Williams' group 1 and Vince's fabric A4 are the same. These correspond with the siltstone tempered wares in the County type series, fabric 132 (unglazed siltstone tempered ware) and fabric 111 (glazed siltstone tempered ware). Williams' group 2 corresponds to Vince's fine micaceous wares. Vince subdivided this group into three. One of the group was the same as Hereford fabric A7B. This was not previously present in the County type series and has been numbered 134. The two other subdivisions were the same as fabrics 66 and 92 in the County type series. Another new fabric isolated by Vince was the highly micaceous ware, fabric 135. Microscopic examination of the pottery from the Buttercross seemed to confirm the fabric groups determined by petrological analysis. This process was helped by this sectioning some of the type series sherds which were thought to be manufactured in Herefordshire/south Shropshire. All the thin sectioned material is held by the Archaeological Service and has been integrated into the County type series.

When the pottery is examined stratigraphically in context strings, it is apparent that there are five ceramic horizons. In the earliest contexts four fabrics are present, glazed and unglazed siltstone tempered ware (fabrics 111 and 132), Malvernian unglazed ware (fabric 56) and Worcester type sandy glazed ware (fabric 64.1). The Malvernian ware from the earliest contexts is black throughout with sparse rock fragments. It is therefore rather darker and less coarse then the Malvernian ware usually encountered in Herefordshire and Worcestershire. The next fabrics to appear are the local red micaceous wares (fabrics 60, 66, 92, 134 and 135). There is presumably some overlap with the preceding fabrics but it is not possible to say because it is difficult to judge how much of the earlier pottery is residual. On urban sites residuality can seriously skew statistical information. This can be seen on the large urban excavation at Deansway Worcester (V. Buteux pers comm). However in general the pottery from the Buttercross is in large pieces and shows little sign of abrasion. There are very few examples of cross-joining sherds, and little evidence of obviously early pottery occurring in late levels. The frequent occurrence of cross-joining sherds is generally accepted as a good indication of major site disturbance and the lack of this coupled with the other details outlined above would tend to suggest that this site is relatively uncontaminated and therefore provides good conditions for an examination of the development of ceramics in the town.

The third ceramic horizon is characterised by the appearance of wheel-thrown oxidised Malvernian ware (fabric 69), which continues in use with the local micaceous red wares. The fourth horizon contains copper-glazed southern white ware (fabric 70) and the fifth and final ceramic horizon is typified by the presence of Cistercian ware (fabric 72). In these last two horizons the main part of the pottery is still made up of the local red wares and the Malvernian ware.

From this basic data a rough dating for the pottery can be established and previous dating verified or disputed. Vince (1985) has suggested a date range of late 13th-15th centuries for the micaceous red wares and of 14th-17th centuries for the oxidised Malvernian ware. A slightly earlier starting date for the micaceous red wares is certainly indicated by the Buttercross material, although there is no evidence as yet that any one of the fabric sub-groups pre-dates the others. The copper-glazed southern white ware ('Tudor Green') generally begins to occur in the midlands and further N. in the 15th century and Cistercian ware has not yet been shown convincingly to occur earlier than the last quarter of the 15th century. The presence of these two wares with the red micaceous wares confirms the latter's use into the 15th century. At the opposite end of the scale, the siltstone tempered wares and unglazed Malvernian ware predate the micaceous red wares and the forms present in these fabrics (see below) would suggest a 12/13th-century date. The small diameter cooking pot in unglazed Malvernian ware (FIG. 7, no. 1) from context 241 (CG11) suggests an early date, probably in the early 12th century. This would agree with similar dating evidence from Friar Street, Worcester (see phase discussions).

FABRICS AND VESSEL FORMS

Early fabrics (12/13th century; FIG. 7, nos. 1-8; FIG. 8, no. 9)

The earliest fabrics (fabrics 55, 56, 57, 111, 132) are found in a very limited range of forms. With the exception of fabric 111, the only form represented was the cooking pot/jar. Diagnostic sherds indicated that these were mainly straight sided with infolded rims, a common 12/13th-century form in the W. midlands. One vessel (fabric 132) had a decorated rim (FIG. 7, no. 5). Fabric 111 was primarily a glazed ware. The sherds were from jugs/pitchers, although a few sherds may have come from bowls, usually with traces of an internal glaze. Some jug sherds were decorated with combing, whilst others had incised horizontal lines. One sherd had a possibly roller stamped, herring-bone pattern. There was a single strap handle sherd and a frilled base (FIG. 7, no. 4). The coarse variant of fabric 111, characterised by a harsh lumpy fabric, is found mainly as cooking pots/jars but there were also two jugs represented and a bowl with an internal glaze. All the cooking pot/jars in the above fabrics were sooted. Two of the bowls (fabric 111) were also sooted.

Late Malvernian ware (14-16th century; FIG. 9, nos. 22-27)

The forms can best be described as falling into three categories: tablewares, vessels associated with food preparation and cooking, and storage vessels. By far the greatest





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quantity of identifiable forms came from the first category. These consisted mainly of jugs, cups and chafing dishes. Food preparation was represented by bowls, pipkins or cauldrons, cooking pot/jars and a strainer. In this group bowls predominated. Some were sooted on the external surfaces showing that they were used for cooking as well as food preparation.

Food storage was represented by cisterns and jars. All these forms are known from Hereford and Worcester and are illustrated in Vince (1977 and 1985), and Hurst (1992).

Micaceous wares (mid-13-15th century; FIG. 8, nos. 10-21)

Like the later Malvernian ware, the majority of vessels in these fabrics are tablewares. The general form types represented are the same with the addition of a circular condiment (FIG. 8, no. 20) and a lid. There were very many fewer cooking pots and bowls represented. Jug forms were generally hard to deduce but at least one baluster jug was represented in fabric 134 and two in fabric 66. In fabric 92 there was an example of a small jug with a rod handle. Both strap and rod handles were present. Although the micaceous wares share many similarities, it was possible to differentiate between them as regards decoration. The most decorated sherds and the widest variety of decorative techniques were found in fabric 66. Decorative techniques included the use of white slip and iron oxide, horizontal combing and applied decoration (FIG. 8, no. 18). There were two corrugated neck sherds from jugs which may or may not have come from the same vessel. From the evaluation material there was an example of a finger-impressed base.

Decoration in fabric 92 was limited to some combing, incised horizontal lines and a cordon. There were also examples of thumbed bases. There were only examples of applied decoration in highly micaceous ware (fabric 135). There was also one example of a jug with a carinated neck.

Late medieval/post-medieval transitional wares

Most of the southern white ware vessels (fabric 70) were cups with one example of a lobed cup. One of the cups (thin section L1050) may be in Border ware (FIG. 9, no. 28). A yellow-glazed sherd from a possible jug may be an example of Kingston ware.

The Cistercian ware vessels (fabric 72; FIG. 9, nos. 29-32) were made up exclusively of cups (FIG. 9, nos 30-1; thin section L1516). Two sherds were decorated with applied clay pellets. A third was decorated with a stamped clay pellet (FIG. 9, no. 32).

Illustrated Pottery

FIGURE 7

- 1. Cooking pot, fabric 56, 241 (CG11), phase 1
- 2. Cooking pot, fabric 56, 176 (CG43), phase 2
- 3. Cooking pot, fabric 56, 257 (CG34), phase 1
- 4. Jug, fabric 111, 100, unphased



FIG. 8 Medieval pottery. ?Shropshire white ware (fabric 136, no. 9), Hereford ware (fabric 134, nos. 10-13), highly micaceous ware (fabric 135, no. 14), and fabric 66, (nos. 15-21). Scales 1:4, except nos. 9 and 18 (Scale 1:2).



FIG. 9 Medieval pottery. Malvernian ware (fabric 69, nos. 22-7), southern white ware (fabric 70, no. 28), and Cistercian ware (fabric 72, nos. 29-32). Scale 1:4, except no. 32 (Scale 1:2).

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Cooking pot, fabric 132, 100, unphased
 Cooking pot, fabric 132, 196 (CG19), phase 1
 Cooking pot, fabric 132, 196 (CG19), phase 1
 Cooking pot, fabric 132, 209 (CG17), phase 1

FIGURE 8

9. Jug with applied decoration, fabric 136, 158 (CG55), phase 2

10. Jug with white slip decoration, fabric 134, 249 (CG7), phase 1

11. Cup, fabric 134, 193 (CG48), phase 2

12. Cooking pot/jar, fabric 134, 198 (CG33), phase 2

13. Jug, fabric 134, 204 (CG33), phase 2

14. Possible chafing dish, fabric 135, 208 (CG35), phase 2

15. Jug, fabric 66, 152 (CG36), phase 2

16. Jug handle, fabric 66, 180 (CG44), phase 2

17. Base of baluster jug, fabric 66, 190 (CG32), phase 2

18. Decorated jug sherd, fabric 66, 201 (CG33), phase 2

19. Base of baluster jug, fabric 66, 220 (CG33), phase 2

- 20. Condiment, fabric 66, 220 (CG33), phase 2
- 21. Jug with thumbed cordon below rim, fabric 66, 229 (CG35), phase 2

FIGURE 9

22. Tripod pipkin, fabric 69, 100, unphased

- 23. Chafing dish, fabric 69, 172 (CG43), phase 2
- 24. Jar, fabric 69, 172 (CG43), phase 2
- 25. Strainer, fabric 69, 172 (CG43), phase 2
- 26. Possible condiment, fabric 69, 172 (CG43), phase 2
- 27. Foot from tripod pipkin, fabric 69, 177 (CG54), phase 2
- 28. Cup, fabric 70, 100, unphased
- 29. Two handled cup, fabric 72, 161 (CG60), phase 3
- 30. Cup, with white clay applied pads, fabric 72, 100, unphased
- 31. Two handled cup, fabric 72, 100, unphased
- 32. Cup sherd with an applied pad of stamped clay, fabric 72, 176 (CG43), phase 2

DISCUSSION BY PHASE

Phase 1 (12 to 15th century; Tables 3-6)

The pottery from this phase is dominated by the siltstone tempered wares (fabrics 111 and 132) which form about half the group both by weight and sherd number, with unglazed Malvernian ware (fabric 56) and the fine micaceous wares (fabrics 66 and 92) also well represented. In phase 1, glazed Malvernian ware (fabric 69) forms a fairly insubstantial element of the group.

The vessel forms from phase 1, consisted mainly of cooking pot/jars, often straight sided and usually sooted. These forms occur in Worcester-type unglazed ware (fabric 55), Malvernian unglazed ware (fabric 56), sandy micaceous ware (fabric 60) and siltstone tempered ware (fabric 132). One sherd in the unglazed Malvernian fabric, from a straight-

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sided cooking pot contained a drilled hole (FIG. 7, no. 3). It was sooted externally. It is uncertain whether the hole represents a functional adaptation of the pot or is the vestiges of a repair. Other fabrics present which seem to belong to the earlier part of the phase (see above) are glazed siltstone tempered ware (fabric 111) and its coarse variant and Worcester-type sandy-glazed ware (fabric 64.1). The coarse variant of fabric 111, occurred both as cooking pot/jars and jugs. There was a flat base which was from a bowl. The glazed siltstone tempered ware (fabric 111) was found as either jug/pitchers or bowls. The former was the most frequent. Bowls in this fabric were sometimes glazed internally. Three of the five examples were sooted on the outside and two of these had internal deposits as well. A jug in this fabric was sooted on the inside and had an internal deposit. It is clear from this that conventional nomenclature for vessel forms can obscure the use to which they were actually put. Three vessels were represented in Worcester-type glazed sandy ware. These were all jugs.

The rim diameters of the cooking pot/jars above varied from 240-300 mm., with no particular concentration of rim size. A cooking pot in fabric 56 had a markedly smaller diameter of 150 mm. Small diameters are usually associated with late-Saxon or Saxo-Norman cooking pot/jars but some are known from 12th-century levels at Friar Street in Droitwich, but do not appear in pre-Conquest levels (Hurst, 1992).

Fabrics which dated to the later part of this phase were oxidised glazed Malvernian ware (fabric 69), and oxidised micaceous wares (fabrics 66, 92, 134 and 135). The variety and relative percentages of vessel forms in these fabrics were very different from those in the earlier fabrics from this phase, with very few cooking pot/jars present. The majority of the forms were made up of jugs. Unfortunately, the sherd size was generally too small for a more detailed identification of form to be made. There was, however, a baluster jug in fabric 134 and a jug with a carinated neck in fabric 135. There was also a small unglazed, body sherd which may have come from a cup and six bowl sherds, all but one of which were glazed on the inside. One sherd was sooted on the exterior. There were four sherds from cooking pot/jars, one of which, in fabric 134, was straight sided. There was also a single sherd of Saintonge ware (fabric 120) with polychrome decoration.

Phase 2 (15 to 16th century; Tables 3-6)

The dominant fabrics in this phase were oxidised glazed Malvernian ware (fabric 69) and the oxidised micaceous wares (fabrics 66, 92, 134 and 135). The Malvernian ware formed the single largest group. Of the fine micaceous wares the most common is fabric 66 and the least common is fabric 134 (Hereford fabric A7B). The highly micaceous ware (fabric 135) is also better represented than the latter. This would tend to support the conclusions drawn from the petrological analysis of the pottery that the sources of manufacture of fabrics 66, 92 and 135 were close to Leominster, and accordingly had a bigger share of the market. Fabrics which appear for the first time in this phase are southern white ware (fabric 70), and Cistercian ware (fabric 72). There was some residual pottery, but this did not make up a significant part of the phase group.

The range of forms in this phase was greatly increased, although the quantity of pottery was also comparatively larger. Forms tended to reflect food preparation/storage and

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Table 3. Quantification of pottery from medieval deposits by sherd count

Fabric	Phase 1	Phase 2	Grand Total
55	1	2	3
56	22	7	29
57	0	1	I
60	5	5	10
64.1	4	0	4
66	29	115	144
69	10	146	156
70	0	19	19
72	0	13	13
92	13	64	77
111	62	26	88
120	1	0	1
132	38	2	40
134	7	22	29
135	5	47	52
136	0	1	1
137	0	1	1
138	0	1	1
Grand Total	197	472	669

Fabric	Phase 1	Phase 2	Grand Total
55	0.5%	0.4%	0.4%
56	11.2%	1.5%	4.3%
57	0.0%	0.2%	0.1%
60	2.5%	1.1%	1.5%
64.1	2.0%	0.0%	0.6%
66	14.7%	24.4%	21.5%
69	5.1%	30.9%	23.3%
70	0.0%	4.0%	2.8%
72	0.0%	2.8%	1.9%
92	6.6%	13.6%	11.5%
111	31.5%	5.5%	13.2%
120	0.5%	0.0%	0.1%
132	19.3%	0.4%	6.0%
134	3.6%	4.7%	4.3%
135	2.5%	10.0%	7.8%
136	0.0%	0.2%	0.1%
137	0.0%	0.2%	0.1%
138	0.0%	0.2%	0.1%
Grand Total	100.0%	100.0%	100.0%

Table 4. Percentages of pottery fabrics from medieval deposits by sherd count

Fabric	Phase 1	Phase 2	Grand Total
55	4	13	17
56	362	81	443
57	0	6	6
60	64	34	98
64.1	45	0	45
66	231	1758	1989
69	53	2829	2882
70	0	47	47
72	0	58	58
92	124	682	806
111	497	191	68 8
120	1	0	1
132	586	0	586
134	204	304	508
135	27	566	593
136	0	20	20
137	0	5	5
138	0	8	8
Grand Total	2198	6602	8800

Table 6.

Percentages of pottery

fabrics from medieval deposits by sherd weight Table 5. Quantification of pottery from medieval deposits by sherd weight

Fabric	Phase 1	Phase 2	Grand Total
55	0.2%	0.2%	0.2%
56	16.5%	1.2%	5.0%
57	0.0%	0.1%	0.1%
60	2.9%	0.5%	1.1%
64.1	2.0%	0.0%	0.5%
66	10.5%	26.6%	22.6%
69	2.4%	42.9%	32.8%
70	0.0%	0.7%	0.5%
72	0.0%	0.9%	0.7%
92	5.6%	10.3%	9.2%
111	22.6%	2.9%	7.8%
120	0.0%	0.0%	0.0%
132	26.7%	0.0%	6.7%
134	9.3%	4.6%	5.8%
135	1.2%	8.6%	8 6.7%
136	0.0%	0.3%	0.2%
137	0.0%	0.1%	0.1%
138	0.0%	0.1%	0.1%
Grand Total	100.0%	100.0%	100.0%

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food consumption rather than cooking. Vessels which were not residual, were made up of plain glazed jugs, cisterns, bowls, pipkins (FIG. 9, nos. 22 and 27), cups (FIG. 8, no. 11 and FIG. 9, nos. 28-32), chafing dishes (FIG. 9, no. 23), a condiment (FIG. 8, no. 20) and a strainer (FIG. 9, no. 25). There were very few cooking pot/jars. By far the greatest variety of form per quantity of sherds occurred in the oxidised glazed Malvernian ware (fabric 69). Fabric 66 had the least variety and consisted almost entirely of jugs with a small number of bowls and cooking pot/jars. There was also a condiment (FIG. 8, no. 20) and a lid. The other micaceous fabrics contained a mixture of jugs, bowls and cooking pot/jars. There were three cups present in fabric 92, two cups in fabric 66 and a possible chafing dish in fabric 135 (FIG. 8, no. 14).

More precise details about the vessel forms are lacking because most of the sherds were body sherds which allowed only a general vessel category to be given. Two baluster jugs (FIG. 8, nos. 17 and 19) and a straight-sided cooking pot/jar which had a drilled hole and an internal deposit, were identifiable. A jug on fabric 92 had a hole drilled in the shoulder, probably part of a repair. All handles from either jugs or cisterns, were plain, undecorated strap handles. As in the previous phase some of the bowls were sooted on the outside. There was a small quantity of abraded pottery from this phase. This may reflect some residuality but may in some cases show wear and tear on the vessels whilst they were in use.

The Cistercian ware consisted entirely of cup sherds. They were generally well made, but one vessel had a glaze which had started to crawl. One cup was decorated with a stamped pad of white clay (FIG. 9, no. 32). The southern white wares likewise consisted of cups, one of which was lobed and a single jug.

Phases 3 and 4 (17 to 20th century)

Detailed examination of the pottery from these phases was not included in the research design. Consequently the pottery was divided into medieval (general fabric 99) or post-medieval (general fabric 100). There was a small percentage of residual pottery in these phases. Unfortunately it was not possible to compare the blackware from these phases with blackware from the Lingen kiln site, as this was outside the research design for the project. This is a topic which needs to be addressed by future work.

Comparison with other sites

The main sources of pottery supply for Leominster during the medieval period were local. In the earlier medieval period these tended to be siltstone tempered wares. In the later period they were fine oxidised micaceous wares. From both the petrological and microscopic examination of the pottery it is clear that there were several sources of production for these wares. Pottery which was not from the immediate locale, came from a comparatively restricted area for instance the Malverns or the Worcester area. There are however exceptions to this. The most noteworthy is a sherd of polychrome Saintonge ware. Saintonge vessels are not uncommon in English ports such as London, Southampton and Bristol and they are thought to reflect the wine trade with southwestern France. These vessels often then travel further inland for instance to Gloucester and Worcester using major waterways such as the Severn. However, Leominster is relatively remote and it is tempting to think that the occurrence of Saintonge ware may be associated with a Leominster merchant travelling to Worcester, Bristol or London and bringing the jug back as a novelty.

The presence of southern white wares in Leominster is something of a surprise, since it is often assumed that 'Tudor green type' ware in the midlands is a locally produced imitations. However, it has been observed elsewhere (Ratkai forthcoming (a)) that there is a N.W. to S.E. trend in the distribution of some pottery types, most noticeably Boarstall-Brill ware. This has been linked to the Droitwich salt trade (Ratkai forthcoming (a)), but since these wares are found in Hereford and further W. in Abergavenny and Monmouth there are other factors at work. Southern white wares are found in Hereford. There is therefore a strong indication of a trade/exchange network with the S.E. as Vince (1985) also notes. This economic trend may be of some antiquity as Hurst (1992, 139) has also noted a close correspondence between saltways and pottery supply in Droitwich for the Saxo-Norman period, with both being most strongly developed to the S. and S.E. of the town.

There is little further firm evidence for the absolute dating of the pottery from Leominster. The relative chronology is somewhat stronger especially on the evidence of the context strings. This would seem to suggest that the local red micaceous wares are carlier than the oxidised wheel-thrown Malvernian ware (fabric 69) and that copper-glazed southern white ware is in use in Leominster before Cistercian ware.

The range of vessel forms from the site is notable for the comparative lack of cooking pots. These seem to be mainly confined to the earlier fabrics but even then there is a comparatively high proportion of jugs and to a lesser extent bowls. The later fabrics are made up of vessels which could be categorised as primarily tablewares, followed by vessels for food storage and preparation and lastly for cooking. This shows that metal cooking posts were the norm for the inhabitants of this area of Leominster by the later medieval period. However, in general there is the increasing use of metal cooking posts by this period even in poorer households. This factor on its own is not enough to determine status. There are, however, specialised ceramic cooking vessels, for instance pipkins and tripod pipkins from the Buttercross site. The former were probably used for cooking sauces. The concentration of tablewares (e.g. cups, chafing dishes, condiment and jugs), the lack of standard ceramic cooking pots, and the presence of specialised cooking vessels would tend to suggest a relatively high status assemblage.

There are several close parallels with the pottery from Hereford but also differences. Vince (1985) records the paucity of ceramic cooking pots towards the end of the medieval period, when they formed less than 12.5% of the group. However this is still a rather greater proportion than at Buttercross in the same period. The evidence from the Buttercross site concurs with that from Hereford in showing that the oxidised micaceous wares pre-date the oxidised-glazed Malvernian wares, although in both places Malvernian ware supplants the more local wares in the 16/17th centuries.

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There are differences however. Vince (pers comm) notes a drop or even hiatus in pottery usage in Hereford in the later medieval period. The sequence at the Buttercross seems to be continuous with Cistercian ware well represented, unlike the Hereford sites. Hereford groups did, however, produce pottery which was not found at the Buttercross, for instance Stamford ware and German stoneware. The presence or absence of German stonewares is a question of great interest in the W. midlands. Despite their prevalence on coastal sites and their hinterlands, large quantities of stonewares are not normally found in the W. midlands. The exceptions to this are river ports such as Worcester and some castle sites (e.g. Stafford Castle), although it must be noted that Dudley Castle produced less than a dozen stoneware vessels in a 200-year period (S. Linnane pers comm). In this respect the Buttercross site fits with the normal W. midlands pattern.

Finally one further question which needs to be addressed is the manner in which pottery was traded and transported, in particular the products of the Malvernian industry. Although many Malvernian wares are thought to have travelled on the river Severn, not all products were transported this way. The question is made more difficult by the relative lack of knowledge concerning the location of the kiln sites (Hurst, 1994). The dominance of Malvernian products in both Hereford and Leominster in the later medieval/early postmedieval period suggests that they were competitively priced and available in sufficient quantity, so that they could effectively compete with more local products. This means that transport and production costs must have been kept low. Indeed the competition may have been so effective as to put the more local producers out of business. Perhaps the most efficient method of transport of the pottery to Leominster was via the river Severn to Worcester and then by road via Bromyard (see Jackson, 1954). The Leominster, Bromyard and Worcester road was shown by Jackson (1954) to be a major eastern routeway in the medieval period. It is known that Leominster wool merchants brought their wool to Worcester, as did most of the wool producers in the W. midlands, where it was woven into cloth (V.C.H. II, 283). Cloth production on a major scale developed and expanded in Worcester from the 14th century. It is not inconceivable that in this later medieval period, rather than return with empty carts or unladen pack animals the merchants would load up with Malvernian pottery. If this is the case then transport costs would be reduced since they had in effect been provided by the wool trade. A similar system was postulated (Ratkai forthcoming (b)) for the medieval settlement at Burton Dassett, S. Warwickshire, where ceramic supply was dominated by the Nuneaton kilns, despite their being over thirty miles distant. In this case the transport of grain from Burton Dassett to religious establishments in the Nuneaton area, attested by documentary evidence, seems to have produced much the same effect as the one described above. Further work both in Leominster and Bromyard is necessary to explore these possibilities further.

WORKED STONE BY F. ROE

The mortar fragment (FIG. 10) was unstratified, but it is of interest as it is not usual for mortars made from Old Red Sandstone to be recorded. The base survives, together with part of a solid lug, and the outer surface is roughly striated. It is made from purple/red, compact, feldspathic sandstone which compares with the Lower Old Red





XVII - The floor of the period 1b semi-basement.



XVIII — A jug and two tankards of Westerwald ware imported from Germany.



XIX — Chafing dishes.



XX — N.W. corner of medieval cellar (CG35).



XXI — Medieval cellar (CG35) in foreground, and walls (CG30, 31) in background (centre and right), and concrete piers of the 19th-century market hall.



XXII --- Medieval cellar (CG46) with later brick lining incorporating an oven (CG47).

Sandstone Brownstones. It is not possible to suggest a particular source for this but it is unlikely to be far from Leominster.

Mortars made from Old Red Sandstone appear to be a rarity. In his survey Dunning describes ones of Purbeck marble, Quarrstone and other varieties of limestone, including Caen stone (Dunning, 1977), but these are mostly from southern and eastern England. Further finds of mortars made from Old Red Sandstone and also other materials might be expected to occur to the N.W. of this area.

There is one shaped block of building stone from phase 2 (120), made from a hard, buff coloured Old Red Sandstone. Leominster itself lies on marl and cornstone, both unsuitable for building stone but there were quarries some four miles away both at Leysters Pole and Puddleston (Symonds, 1872, 222) and these may have been sources for the building stone used in the town.

A further ten contexts have provided examples of stone roofing tile from phases 1-3. One larger piece (211) from phase 2, made from grey Old Red Sandstone, demonstrates the rectangular shape typical of medieval and later stone roofing tiles. The majority of these tiles were made from a purplish/pink variety of Old Red Sandstone. Fissile, laminated sandstone, suitable for use as tiles occurs locally in the St. Maughans Group or Dittonian (Brandon, 1989, 45). Tilestone of this type was quarried in Queens Wood on Dinmore Hill some five miles S. of Leominster (Clarke, 1951, 226) and this could be the source of the tiles from the Buttercross site. In an area that is entirely Old Red Sandstone, it would seem that the local lithic resources were being used to their full potential.

OTHER ARTEFACTS BY S. RATKAI

Phase 1

There was a small group of twenty iron objects from this phase. These were mainly nails or amorphous corroded lumps. A number of tools or possible tools were also present; a chisel or more probably a punch (CG9), a possible blade (CG16), an awl or chisel (CG19), and a small chisel (CG23). A single copper alloy object came from context 257, CG14, of unknown function, possibly part of a balance (FIG. 11). There was a small amount of ceramic roof tile (CG8).

Phase 2

As in phase 1 the majority of iron objects were nails. There were sixty-six examples in all with no significant distribution pattern. There was once more a small collection of tools; a possible punch (CG36), two cold sets or punches and a possible blade (CG43) and a knife blade (CG44). Other iron objects were a needle (CG30), a possible wall hook (CG43), and two hooks or bent nails (CG43).

Copper alloy objects comprised a corrugated sheet, possibly a chape (CG33), four small sheet fragments (CG37), a nail or stud and three pins, one with a globular head (CG43), another pin (CG55), and a small rectangular belt plate with a central perforation with the remains of the iron nail with which it was attached (CG43).



FIG. 10 Stone Mortar



FIG. 11 Copper alloy object. There was a single lead object, perhaps a counter or seal (CG25). It was a disc bearing, as the central motif, the letter S and with the circumference decorated with raised dots. The reverse of the disc is plain. Two pieces of glass were also found in this phase; one a piece of pale blue-green window glass, the other a corroded, pale green fragment of vessel glass (CG35).

Building materials were found in several contexts. They fall into four groups; stone roof tile (see above), ceramic roof tile, brick, and floor tile (see Table 7).

	flat glazed	flat unglazed	ridge glazed	ridge crested	stone	floor	brick
context							
198/cg33					1		
152/cg36			1				
133/cg37						1	
139/cg38	1						1
172/cg43	2	3	2		2		1
175/cg43					1		
176/cg43	1						
183/cg44					1		
211/cg44	1						
158/cg55		1		1	2		
151/cg58		1			1		
total	5	5	3	1	7	1	2

Table 7. Quantification of ceramic building materials in phases 1 and 2

Phases 3 and 4

There was a mixture of metal finds, building materials, vessel glass, including a complete wine bottle, and clay pipe, some of which was stamped. Most of the clay pipe bowls had a flat heel but there were two spurred types. In phase 4 there was a residual medieval stone mortar (see above).

METAL-WORKING RESIDUES BY J. D. HURST AND T. FINNEY

Most of the hammerscale from ironworking was from phase 1 (CG5, 7, 9, 12, 14, 17, 18, 19, 34). Though found across the site, there was a particular concentration of this material in one pit (CG9). This and an adjacent pit (CG7) also contained a substantial quantity of iron slag (1.43 kg. and 4 kg. respectively), which were the largest single concentrations of iron slag on the site in any phase.

The amount of metal-working debris (6.3 kg.) was, compared to most ironworking sites, very small and was not found *in situ* (i.e. with a working floor or structural evidence for metal-working). The debris comprised both slag and hammerscale, the former including a small quantity of hearth bottom (CG9). Both the hammerscale and hearth

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bottoms are diagnostic of iron smithing, and it is likely that all the assemblage was the result of iron smithing. A small amount of the slag had coal or coke inclusions, suggesting that these fuels were being used in place of charcoal for smithing.

The iron smithing residues are of considerable interest as few medieval sites in the region have produced remains of this type. It is clear from the Leominster assemblage that a smith was working close to the site, probably just to its N. Astill (1993, 272) has commented that little smithing waste may be recovered from a site as it was re-used for metalling roads, and that only small quantities of hammerscale may be found on floors close to hearths.

In the case of the Buttercross site the general distribution of ironworking residues may hold implications for spatial arrangement of the site during this period. Its general occurrence across the site suggested that the area of the excavation may have been part of one large plot in this period, or, at least, that any subdivisions were not strictly defined.

ENVIRONMENTAL REMAINS BY E. A. PEARSON

Sampling policy

The environmental sampling policy was as defined by Clare de Rouffignac. Large animal bone was hand-collected during excavation and samples of one to five litres taken from thirty-eight contexts of medieval and post-medieval date (see Table 8). A total of seven samples were selected for full analysis following assessment.

Table 8. List of environmental samples taken

Context	Туре	Phase
128	floor	2-3
131	post-hole	2
140	?layer	2-3
144	char layer	2
145	clay layer	2
150	char layer	2
157	char layer	3
158	pit fill	2
170	clay layer	2
172	pit fill	2
174	char layer	2
177	pit fill	2
182	pit fill	1
187	clay layer	1
193	layer	2
196	layer	1
202	clay layer	3
203	layer	1
205	clay layer	1

207	clay layer	2
209	pit fill	1
211	cess pit	2
221	layer	1
224	pit fill	1
226	pit fill	1
234	pit fill	1
236	pit fill	1
238	layer	2
239	hearth	1
241	pit fill	1
243	pit fill	1
247	layer	2
249	pit fill	1
250	char layer	2
257	pit fill	1
265	layer	1
270	pit fill	1

Processing and analysis

The samples were processed by flotation followed by wet-sieving using a Siraf tank. The flot was collected on a 500 mm. sieve and the residue retained on a 1 mm. mesh. This allows for the recovery of items such as small animal bones, molluscs and seeds.

The residues were fully sorted by eye and the abundance of each category of environmental remains estimated. The flots were fully sorted or scanned using a low-power EMT light microscope and remains identified using modern reference specimens housed at the County Archaeological Service. Results of the analysis are summarised in Table 9.

As assessment of the hand-collected animal bone has been carried out by Stephanie Pinter-Bellows and is available as an archive report (Pinter-Bellows undated). This study has shown that the collection did not justify any further work being carried out, unless the faunal assemblage is added to at a later date. The results of this work are summarised below.

Hand-collected animal bone

The assessment (Pinter-Bellows undated) has shown that the assemblage is dominated by the usual domesticates: cattle and sheep/goat are the most common; pig is scarcer. Chicken, goose, oyster shell and an antler peg were also identified.

Some of the bones provided evidence of butchery and prolonged contact with water. Mild gnawing by dogs also indicated that at least some of the bones were left on the surface for a length of time.

The number of bones are below the limits which can be used to give statistical inferences about diet or animal husbandry. However, the good conditions of these bones sug-

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gest that other excavations in Leominster should result in meaningful faunal information, therefore sampling and recovery methods should be planned accordingly.

Remains from wet-sieved samples

The samples selected for analysis showed good preservation of plant remains preserved by charring, mineralisation or anaerobic conditions. Small mammal, fish and bird bone, mineralised fly pupae were also present in low concentrations. No further analysis was carried out on these animal remains as they represent a collection too small to provide meaningful information.

RESULTS (Table 9)

PHASE I (12 to 15th century)

Two samples were selected for analysis: a layer (196) and a fill of a pit (209).

Context 196; CG19

With the exception of small quantities of fish bone and fragmented mammal bone, the majority of the remains recovered were charred plant remains. The assemblage was dominated by cereal grain, a sizeable proportion of which could be identified as bread wheat (*Triticum aestivum*) or wheat (*Triticum sp.*), in association with occasional rye grains (*Secale cereale*). Weed grasses (Gramineae), oat (*Avena sp.*) and legumes were also present.

Context 209; CG17

The remains recovered from this context were predominantly charred cereal remains of similar composition to the above context, in association with small quantities of fish bone and fragmented mammal bone.

The environmental remains were poorly preserved in the remaining samples from this phase, consisting of small quantities of fragmented animal bone and occasional charred cereal grains.

PHASE 2 (15 to 16th century)

A total of five samples were selected for analysis: a charcoal-rich layer (150), pit fill (177), pit fill (211), and two associated charcoal-rich layers (238 and 250).

Context 150; CG26

Abundant charred plant remains were recovered, with small quantities of seeds preserved by anaerobic conditions, fragmented large mammal bone, small mammal and fish bone.

Botanical name	common name	habitat	150	177	196	209	211b	211(238	250	
Charred plant remains											
Tritteum dicoccum/spelta grain	emmer/spelt wheat	Ŀ							~1	;	
Tritteum spelta type grain	spelt wheat	LL L			Γ¢				~	31	
Trucum aestroum type grain rachis	Dread wheat	L, (L			20				t	1	EX
Triticum sp. (hexaploid)	spelt/rivet/bread wheat	, Ľ	19			89				260	CA
Tritteum sp. grain	wheat	Ц	10	m	69	58		1	4	0	VAT
rachis		ц [1							"	0 18	10
Hordeum vulgare grain cf. Hordeum vulgare	barley	ц (ц							n	01	NA
Triticum/Hordeum sp.	wheat/barley	Ч		-						20	ΤŢ
Secale cereale	rye	AF	_		ŝ	2				176	ΉI
cf. Secule cereale					ŝ	-				1	ΕB
Triticum/Secule sp.	wheat/rye	ĹĿ							m	17	U
Cercal sp. indet grain	cereal	(L. †	62	m	74	106		13	10	417	TTE
culm node		المك								71 6	ERG
coleptile		ا ۲								×0 •	CR
Bromus sp.	brome grass	AF									OS
Avena sp.	oat	AF	10		m,	4	m			111	S,
cf. avena sp.			14		- •	20					LE
Avenal Secale sp.	oat/rye	AF		1	m		3		000	10	ON
Gramineae sp. indet/grain	grasses	AF	15	ŝ	30	47	N	6	680		111
Ramunculus acristrepens bulbosus	buttercup	ABCD	ŝ	47	ļ	2				32	NS.
Vicial Lathyrus sp.	vetch/vetchling/pea	ABCD	13	~	n	0		×	25	2364	FE
Leguminosae sp. indet	legume					N.					R
Rumex acetosella agg	sheep's sorrel	V								_ •	
Galium aparine	cleavers	ABCD								_ `	
Anthemis conda	stinking mayweed	AB								٩ <u>२</u> °	
cf. Lapsana communis	nipplewort	ABCD								c	
Contaurea sp.	cornflower/knapweed	ABD	→ -							16	
Carex sp. unidentified	sedge	ACDE	- 10			_		1	-	2	
nullacitutica			ò			5					25

fable 9. The plant remains from selected contexts

Table 9. The plant remains from selected contexts (continued)

Botanical name	common name	habitat	150	177	196	209	21 1 b	2111	238	250
Waterlogged/Mineralized plant rema	uns									
Ranunculus acristrepensibulhosus	buttercup	ABCD						+		
Fumaria sp.	fumitory	ABC		+				+		
Vitis vinifera	vine/grape	í íL		+				++		
Vicial Lathyrus sp.	pea/vetch/vetchling	ABCD					*+		*+	
Rubus fruiticosus agg	bramble etc.	CD					+	+		
Fragaria sp	strawberry	CDF						+		
Malus sp.	apple	Ĺ					*+			
Malus/Pyrus sp.	apple/pear	Ĺ					*+			
Conium maculatum	hemlock	ABCDE		+						
cf. Petroselinum crispum	garden parsley	ц							*+	
cf. Umbelliferae sp. indet	umbellifer		+							
Rumex sp.	sorrel/dock	ABCDE		+						
Urttea dioica	common nettle	BCD		+						
Ficus carica	fig	Ĺ		+ + +			+ + +	+ + +	+	
Hyose yumus niger	henbane	В		+ +			+			
Sambucus nigra	elderberry	BC	+	+	+		+	+		
Anthemis cotula	stinking mayweed	AB								
Compositae sp. indet					+					
Carex spp.	sedge	ш	+	+			+	++		
Gramineae sp. indet							*+			
unidentified			5				*6		* m	
Habitat Key		Abundance k	cv							
A = cultivated ground		+ = 1-10	÷							
B = disturbed ground		++ = 11 - 50								
C = woodlands, hedgerows and scrut	o etc.	+++=5[-10]	0							
D = grassland, meadows and heathla	nd	++++ = 100	+							
E = aquatic/wet habitats: ditches, stre	sambanks etc.									
F = cultivar										

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Cereal grains dominated the assemblage of charred plant remains, the majority of which could be identified as wheat. However, many of these grains were transitional in form between a spelt type wheat (*Triticum spelta*) and bread wheat (*Triticum aestivum*).

The cereal grains were twice as abundant as the weed component, which included weed grasses, oat, vetch/vetchling (*VicialLathyrus* sp.), cornflower/knapweed (*Centaurea* sp.) and sedge (*Carex* sp.).

Context 177; CG54

Charred plant remains were present in low concentrations, consisting only of occasional cereal grains and weed seeds. However, seeds and a fly pupa which may have been preserved by mineralisation or anaerobic conditions survived. Abundant fig seeds with grape and elderberry pips indicated a possible cess component. Seeds of other species probably form part of the background flora residual in most deposits.

Context 211; CG44

The remains from this context form one of the best preserved assemblages recovered. The deposit was well preserved by mineralisation and anaerobic conditions. The high concentration of fruit pips (particularly of fig) and mineralised concretions suggest a high faecal input into the pit. In addition to fig, seeds of other edible fruits, such as apply/pear, blackberry, strawberry, elderberry, grape, a mineralised apple core and an unidentified mineralised berry were identified. Other seeds commonly found in association with such remains included henbane (*Hyoscyamus niger*), sedge (*Carex* sp.), and fumitory (*Fumaria* sp.). Occasional charred cereal grain and weed seeds (presumably domestic refuse) were also recovered.

Context 238; CG27

An assemblage of charred plant remains similar to contexts described above was recovered. Both compact-eared bread wheat (*Triticum aestivo-compactum*) and spelt or emmer wheat (*Triticum dicoccum/spelta*) type grains were identified. A low concentration of mineralised remains also survived, consisting of fig (*Ficus carica*), vetch/vetchling and a possible parsley seed (cf. *Petroselinum crispum*).

Context 250; CG27

remains fully mineralized

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These remains form the richest assemblage of charred plant remains recovered. Unlike the charred assemblages described above, the weed component in this case is predominant. Vetch/vetchling seeds and grasses are particularly numerous, and stinking mayweed (*Anthemis cotula*), buttercup (*Ranunculus acrislrepenslbulbosus*), cleavers (*Galium aparine*), nipplewort (*Lapsana communis*), sedge (*Carex* sp.) and sheep's sorrel (*Rumex acetosella*) are also present.

It is not clear whether the large number of oat grains present are the cultivated species, and therefore whether they were grown as a crop, or were a crop weed contami-

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nant. Cereal grains, although numerous, were far less abundant than the weed contaminants. A significant proportion of these were identified as a hexaploid form of wheat (spelt/rivet/bread wheat), with some spelt type wheat and barley (*Hordeum vulgare*). Rye also formed a notable element of the assemblage, and like oat, may have been part of a crop, or a weed contaminant.

A small number of cereal chaff remains, unique to this context, include rachis fragments of bread wheat, a culm node and a coleoptile fragment. This assemblage appears to represent crop waste, possibly the residue from fine sieving (Hillman, 1981).

The remaining contexts contained few environmental remains, although in some samples, from various features, including pits, floor surfaces and charcoal-rich layers (contexts 128, 158, 172, 193) seeds of fig, blackberry and elderberry in low concentrations suggest a faecal element.

PHASE 3

No samples were selected for analysis from this phase.

CROP PROCESSING AND DIET

The samples selected for study demonstrate the widespread disposal of charred cereal crop debris on the site and in one case (CG44) well preserved cess material. Fish bone and fragmented mammal bone scattered in low concentrations probably forms part of the background of redeposited waste common on many urban sites (cf. Greyhound Yard, Leominster (Pearson, 1993)).

Comparisons between period 1 and 2 are difficult to make as only two samples merited analysis in detail from the first phase. However, as a result of rapidly scanning samples it is apparent that fruit seeds preserved by mineralisation and anaerobic conditions are more frequent in phase 2 contexts, possibly indicating a higher incidence of faecal contamination of deposits.

Cereal crop consumption and disposal

In most cases, the charred cereal remains were rich in cereal grain (the identifiable grains being most commonly free-threshing bread wheat). Although not as numerous, weed grasses and legumes made up a sizable element of most assemblages. With one exception (from CG27) no chaff residues were found.

Much of this waste appears to result from the final stages of crop preparation prior to consumption. Free-threshing cereals are generally stored as prime grain, partially contaminated with large weed seeds remaining after threshing and sieving. Piecemeal handcleaning is required to remove these contaminants (Hillman, 1981). In this case, however, it is difficult to determine whether the assemblages represent a grain product heavily contaminated with large grasses and legumes, or the by-product after cleaning when many of the small cereal grains would have been removed with the large weed seeds.

The lack of chaff waste in most samples may result from a bias in preservation, as the chaff of free-threshing cereals is easily destroyed by fire. Alternatively, it is as likely that this waste (a by-product of earlier stages of crop processing) had been eliminated elsewhere before being brought to market in the town. This can be expected in an urban area, where much grain is likely to have been imported in a fully processed state. The exception, however, is a burnt layer (from CG27) in which an assemblage of charred crop remains dominated by weed seeds, contained chaff remains indicating an earlier stage of crop processing.

In the latter case, the waste is likely to have been burnt when used as fuel for fires, while the disposal of grain-rich deposits is likely to have followed accidental burning during grain drying in ovens in preparation for storage or milling.

Disposal of cess waste, and diet of the inhabitants

Mineralised remains have been found scattered in low concentrations across the site. However, one sample (from CG44) appears to represent a discrete cess-pit fill. A high concentration of edible fruit seeds here, in association with mineralised (phosphate) concretions and fly pupae suggest a significant faecal element in the deposit. Phosphate concretions are formed by high concentrations of calcium phosphate present when faecal material is broken down; while the seeds from edible fruits which are easily swallowed, pass out through the gut in the faeces.

These results contribute to information on local diet in the late medieval period, albeit somewhat biased towards small-seeded fruits. Small seeds which pass through the gut and are robust are well represented in cess deposits. Evidence of edible vegetables is far less common as generally it is the soft perishable part of the plant (which rarely survives unless water-logged), rather than the seed which is eaten.

Of the cultivated fruits, fig and grape are likely to have been imported. Fig can be cultivated in Britain in sunny, sheltered conditions, although in this climate it tends to produce fruit with vestigial seeds. As the seeds in this deposit are all well formed, it is assumed that they derive from fruit imported from elsewhere. Although grape is most likely to have been imported, the possibility of local production can be considered. Grape vines can be grown in this country and vineyards were a particularly successful enterprise in the medieval period. Homes (1973) lists two cases where fields in the Leominster area were named 'vineyard' in the Tithe Apportionments of Herefordshire (1835-1845), and Roach (1985) notes that vines were important in Worcestershire in the 12th and 13th centuries. Although there was a tradition of vine cultivation in the region during the medieval period, by the early part of the 14th century, and by the time this deposit was formed, vineyards in the British Isles were generally in decline (Roach, 1985).

Apple and pear trees were probably cultivated in orchards locally, while blackberry, strawberry, elderberry could have been collected wild, and they would have been readily available in surrounding hedgerow and scrub. An unusual find of possible garden parsley (from CG27), is likely to be a garden cultivar in this context, although it can grow as a casual or escape from cultivation. Documentary sources suggest that it was not widely grown until the end of the 17th century (Stuart, 1987), although it has been found archaeologically from Roman deposits at Silchester (Dickson, 1994) and post-medieval deposits in London (Giorgi forthcoming). The find of parsley in Leominster suggests that it was present in late medieval Herefordshire.

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This type of assemblage is rare in this region. Although low levels of mineralised cess were found at Bargates, Leominster (Napthan, Pearson and Hurst, 1994), no identifiable seeds were recovered. Indeed, the high concentrations of fig seeds are of particular interest as they are the first to be recovered from Leominster.

Cess material of this nature can be of importance for indicating the social status of the inhabitants of a site, as imported exotic species can be expected to occur more frequently in wealthier areas. Assemblages from cess-pits in the region, as yet, show a narrower range of imported or cultivated species compared to other urban centres, particularly London. This is, indeed, the first instance of an imported exotic (fig) being found in abundance in a small town in the county. However, as so few mineralised cess assemblages have been studied in this locality, it is difficult to assess its implication for the social status of the inhabitants of Buttercross.

COMPARISON WITH OTHER SITES

This site forms the largest body of environmental evidence for Leominster, to date. Environmental remains have been recovered from a further three sites in Leominster since the excavation of Buttercross, at Greyhound Yard (Pearson, 1993), Bargates (Napthan, Pearson and Ratkai, 1994) and the Hop Pole Inn (Buteux, Pearson and Ratkai, 1994).

With the exception of the Hop Pole Inn, the results show the disposal of waste relatively characteristic of urban sites. At Buttercross, Greyhound Yard and Bargates, waste from the final stages of cereal grain preparation (probably representing mixed domestic refuse) has been found scattered in pit-fill deposits. As would be expected in an urban location, little evidence of chaff or waste from early stages in crop processing has been recovered, suggesting that, generally, this process is undertaken outside of the town. However, in small towns some inhabitants may have farmed the surrounding land, and carried out agricultural processing in the town. The crop waste from one context at the Buttercross may be an indication of such activity. Mineralised cess waste is a common feature in towns from the medieval period. However, in Leominster, apart from cess waste in the form of mineralised concretions noted at Bargates, the cess assemblage at Buttercross remains the sole example containing identifiable food remains.

The largely domestic refuse found at Buttercross provides a contrast to waste from industrial processes found at the Hop Pole Inn, Leominster, where an unusual deposit of industrial waste in the form of debris from flax retting, and tanning or horn-working was recovered from a water-logged layer in a marshy location close to an area where the river Lugg was canalised to feed various industrial processes (Buteux, Pearson and Ratkai, 1994).

The most common cereal crop identifiable to species on the Buttercross site is bread wheat (*Triticum aestivum*), a crop which became the main cereal crop in use from the Saxon period onwards, and one particularly favoured for bread-making. It is therefore an expected occurrence in deposits of medieval and post-medieval date. However, in one sample, oat and rye are notably abundant. In this case, they may have been weeds of a wheat crop, or grown as crops themselves (as individual or mixed, that is, 'maslin' crops). Oat-rich assemblages are becoming an increasingly common find on sites of medieval date, or later, within this county and elsewhere, for example at Commercial Street and High Town, Hereford (de Rouffignac, 1992, and 1993). Historically, oats are known to have been an important resource in towns and cities. They were required in great quantity by London and by the market centres of its hinterland. They were used for fodder (particularly horses) and brewing (Campbell *et al*, 1993). Rye, which occurred at Buttercross, is a crop commonly grown on poorer land, and often used to make cheaper grades of bread.

These remains have added significantly to information on diet and economy in late medieval Leominster. There is a need for more data, and hence sampling for environmental remains should be a high priority during fieldwork, as it can now be seen that a variety of biological remains preserved under different conditions can be expected from excavations in the town (Pearson, 1995).

OVERALL DISCUSSION

Medieval (12-15th century)

It is likely that the excavation area constituted part of the back plot of properties fronting onto the medieval High Street, which in this period functioned as a market area. The principal building(s) on such a plot would have been on the street frontage where shops could take advantage of public access.

A series of pits were probably rubbish pits or quarry pits for clay. Two ovens were of domestic type and size, but widespread finds of slag and hammerscale indicated that there was iron smithing being undertaken in the vicinity. The extent of the residues from this process increased northwards indicating that the centre of this activity was in this direction. There was, however, a general scatter of material of this type across the whole site, and this may indicate that the excavation area was within a single large plot in this period. The ironworking residues first appear in the 13th century with the largest concentrations being in pits dating to the 14/15th century. The possible use of coal in this process is of interest, as it may hint at economic links with S.E. Shropshire or N.W. Worcestershire.

Though this phase covers a long period the site gives a general impression of low intensity usage. The pits contained some traces of domestic waste, and are most likely to have been for rubbish disposal. Apart from general animal bone and cereal waste, there were also fish bones. The presence of two ovens suggest that the area was also an extension of the domestic quarters as a food preparation area, probably associated with kitchens at the rear of High Street properties.

Later medieval (15 to 16th century)

A number of stone buildings were erected in the 15/16th centuries, including two cellars and a latrine. Other stone constructions were less well understood because of their incompleteness. During this phase parts of three parallel plots fronting on to the High Street can be identified, which correlates well with the 18th-century documentary evidence for the disposition of properties across the site (see above). This contrasted with the earlier medieval period, when E. to W. boundaries across the site were not clearly determined from the archaeological evidence.

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Cellars were a feature of this phase, and a well-preserved example (CG35) showed that the method of entry would have been by a ladder. Since there were two cellars of this date in a relatively small area this must indicate that late medieval cellars at the back of properties were once common in this part of Leominster. Evidence from other medieval towns suggests that cellars were relatively common in the later medieval period. For instance at Norwich (Evans and Carter, 1985, 10, fig. 2). Cellars to properties at Sidbury in Worcester were later and dated to the 17th century (Carver, 1980, 168). The simple character of the cellar (CG35) and its inaccessibility from the street showed that it was for storage rather than any commercial use which was typical of the later medieval cellar (Schofield and Vince, 1994, 91 and 94). Dyer (1989, 204) has indicated that features like this were part of large houses suitable for merchants.

Dyer (1989, 204) has also concluded that the 15th-century inhabitants of towns lived through an unparalleled phase of prosperity. This may have been the case for Leominster as it is possible that the infilling of the market area in the High Street had occurred by the late 15th century suggesting a move to a more convenient (and larger) market area elsewhere in the town. It is possible that this infilling is analogous to a suggested subdivision of a larger plot by the later medieval period, and that both phenomena are indicative of pressure on space at the centre of the town. Dyer (1973, 68) has also suggested that Leominster market served a wide area to the E. of the town reaching half way to Worcester.

The stone-built latrine can be regarded as an improvement on the cess-pit, though the latter continued to be used as indicated by environmental evidence from some of the pits of this phase. Dyer (1989, 203) mentions the building of stone-lined latrines in the context of upper storey (internal) latrines, and the proximity of CG36 to another structure to the N. suggests that it served as an internal latrine.

Dyer (1973, 162) has identified two phases of new building in Worcester dated to the late 15th/early 16th century and the late 16th century. He associates the former with an increase in population and prosperity of the local cloth makers. The 16th-century date of some new building in Leominster may parallel this (e.g. indications of early 16th-century construction in the building immediately to the S. of the site (Royal Commission for Historical Monuments, 1934; HWCM 8846).

Most of the structures of this period made extensive use of stone, which suggested that there were local stone quarries of medieval date in the vicinity of the town. Such quarries would clearly have been of considerable economic importance by the later medieval period.

Post-medieval (17 to mid-19th century)

This was a period of considerable change as the cellars and a stone-built cess-pit constructed in the previous phase were infilled by the later 18th century. This may reflect a change in function of buildings, or a change in the arrangement of buildings in the area. The latter seems most likely as the Galliers 1832 map presents a different arrangement of buildings from that reconstructed from the phase 2 archaeological evidence.

By the mid-19th century the buildings on the site included a bank. This and a number of other buildings and a yard were purchased in 1854 for the erection of a new market building.

Modern (mid-19 to 20th century)

The new market hall was built in 1855-6 and a new town hall was incorporated in the new building, replacing the timber-framed market and town hall which had stood in the road opposite the site since 1655. The latter was dismantled. After a period of decline during the mid-20th century the market hall was partly demolished in 1974, and demolition was finally completed in 1984. The site is now occupied by a new library which was opened in 1993.

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ABBREVIATIONS

HWCM - Numbers prefixed with 'HWCM' are the primary reference numbers used by the Hereford and Worcester County Sites and Monuments Record

H.R.O. - Hereford Records Office

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Farm Labour Losses in two Contrasting Regions of England and Wales from 1851 to 1985

By JOAN GRUNDY

The aim of this study is to answer the following questions:

1) was the reduction in the number of farm workers in England and Wales in the mid-20th century greater than in the mid-19th century?

2) were labour losses in both periods evenly distributed between different farming regions?

SOURCES

A. Data on agricultural workers.

1) The 19th century. The printed Census Reports for England and Wales provide personal occupational data for every decade from 1831 onwards. However, these data are not recorded in the same form or for the same geographical area in every decade, posing problems of comparability.

In 1831, for example, there is only one personal category: 'Males Twenty Years of Age [and over]: Labourers employed in Agriculture.' These are recorded by parish or township, hundred, city or borough and ancient county.

In 1891 there are data for males and females in eight age groups, by Registration counties only, for the following occupations: Farmer, Grazier; Farmer's, Grazier's-Son, Grandson, Brother, Nephew; Farm Bailiff; Agricultural Labourer, Farm Servant; Shepherd; Horsekeeper, Horseman, Teamster, Carter; Agricultural Machine-Proprietor, Attendant; Others engaged in, or connected with, Agriculture.

It was therefore necessary to standardise occupational groups and geographical areas in a manner which allowed valid comparison over the longest period of time. The groups chosen were: agricultural labourer, farm servant, shepherd, and horsekeeper, all of which would definitely be employed on farms and were common to the Reports from 1851 to 1891 inclusive. Registration county was the only geographical area common to these years (see below for further discussion of registration counties).

2) The 20th century. Although the census of population could be used for the 20th century also, it is more usual to make use of the Agricultural Returns from 1921 onwards because of the greater precision about which categories are included. 'The returns include bailiffs, foremen and all those engaged on the ordinary work of running an agricultural or horticultural holding, including drainage and other maintenance and repair work, or on the marketing of produce grown on the holding. Persons engaged in farm work who are related to the occupier or to his wife are included even if unpaid, as also are working partners and trainees; but the occupier or principal partner and his wife are excluded, as are

'Before 1955 regular part-time workers were grouped with seasonal or casual workers. Most casual workers are employed directly by farmers, but in England and Wales the returns include all those working on the holding on the census date, even if employed by contractors or gangmasters.' (M.A.F.F. (1968)).

Although the definition of statistically insignificant holdings changed frequently during the study period, since these do not involve the employment of a regular full-time worker they are unimportant in the present context.

The two series of records have other differences. The date of the population census is normally in April, while the Agricultural Returns are dated 4 June - an important factor when work, and therefore labour requirements, are governed by the seasons. In the population census, the household head describes his own occupation but the Agricultural Returns are completed by the occupier of an agricultural holding. (An agricultural holding may lie in more than one county, thus data may not refer strictly to the named county (Best et al, (1962), 59).

There are also difficulties of definition between the two series, that relating to family workers being most likely to influence the present study. A comparison of the two series is given in Table 1.

Table 1. Agricultural workers from two data sources Herefordshire (Administrative County) 1921

	Agric. Return (June)		Pop. Co	ensus
			(Ap	ril)
	М	F	Μ	F
Regular, full time	8419	1158		
	953	77		
Seasonal and casual, incl. part-time	2453	1576		
	402	29		
Ag. labs. farm servs.			7837	438
tractor, drivers, shepherds)				
Farmer's son, daughter, relative assisting			1363	292
-			9200	730
			99	30

Source: Census of Eng. & Wales, Printed Reports, 1921; Agricultural Statistics, 1921.

Even if family workers are included in the census totals as in the Agricultural Returns, number of male whole-time workers are by no means closely reconciled. As might be expected, the census gives little guidance on the extent of seasonal and casual work, or on the importance of female labour.

Data for the two periods can therefore be compared only on a very broad basis, and no reliable conclusions can be drawn about apparent slight differences between the 19th and 20th centuries.

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B. Choice of regions

The choice of contrasting farming regions was influenced on the one hand by the writer's interest in population change in 19th-century Herefordshire. In the case of the second area, in order to test whether or not farm labour losses were influenced by farming systems it was desirable to choose a county of contrasting agriculture. It was also decided to investigate an area where hired labour, (which is unevenly distributed in England and Wales), was well represented. Cambridgeshire, lying on the drier eastern side of the country, was selected.

Examination of the published data for the 19th and 20th centuries revealed that these referred to widely differing geographical 'counties.' It was therefore decided to standardise on areas as close as possible to the administrative counties as reorganised in 1974.

Standardisation posed few problems for the 20th century; the new county of Hereford and Worcester was formed by joining the two former counties of Herefordshire and Worcestershire, (with a slight loss to the West Midlands), while Cambridge was an amalgamation of Cambridgeshire (including the Isle of Ely) with Huntingdonshire (including the Soke of Peterborough). Hereafter, the terms 'county,' 'Hereford and Worcester' and 'Cambridge' refer to the new counties formed in 1974.

The 19th century posed greated difficulties, as occupational data for the census years 1851 to 1891 were published only by registration county, an area often very different in size from the ancient county and in the case of Herefordshire adjusted twice during the period. It was decided to use the 1871 area of the amalgamated registration counties as the standard, which resulted in both of the registration counties being slightly smaller than the new administrative counties (see Appendix).

It should be pointed out, however, that both sets of registration counties include land lying in *other* ancient counties, and parts of the counties studied lie in the registration counties of *other* ancient counties. No corrections have been made for this as the areas are usually fairly small and of similar agricultural terrain, and are considered insignificant to the present study.

The above factors mean that the statistics for the two periods are not strictly comparable because the exact stretches of country referred to for each period are different. It is considered, however, that they are sufficiently similar to allow broad conclusions to be drawn.

FARM LABOUR IN NINETEENTH AND TWENTIETH CENTURY ENGLAND AND WALES

Numbers of male farm workers, obtained from the printed census reports, and from the agricultural statistics are given in Tables 2 and 3. FIGURE 1 shows the index of change using 1851 and 1951 as base years.

Table 2. Farm Workers in England and Wales, 1851 - 91. (male farm servants, agricultural labourers, horsekeepers only.)

		(thousands	5)		
	1851	1861	1871	1881	1891
males, all ages	1110.3	1098.3	922.1	830.5	756.6
% change per decade	-	-1.1	-16.0	-9.9	-8.9
Source: 1851: HORN, P.,	(1985), 94; 18	861-91: HO	RN, P., (19	984), 85.	

Table 3. Farm Workers in England and Wales, 1951 - 85

		(thousan	ds)			
	1951	1961	1971	1981	1985	1991
male, regular, full-time female, casual, & part-time	509.4 51.8	357.4 63.9	190.0 71.1	131.6 65.4	119.1 64.4	*102.5 *63.0
Male		-29.8	-46.8	-30.7		*-22.1
female	***	+23.4	+11.3	-8.0		*-3.7

* projected at same annual average rate of change as that for 1981-85.

Source: M.A.F.F.: Agricultural Statistics

Despite the lack of a comparable series of data, there is no doubt that numbers of male farm workers have declined in the last forty-five years at a far greater rate than in a similar period a century ago. Their numbers in 1951 were roughly half those of a century earlier, and in 1985 about one tenth.

Perhaps because of the agricultural depression of 1875 to 1895, late-19th-century losses were seen by contemporaries to be sufficiently severe to warrant the commissioning of several reports on farm labour (Board of Agric., (1906); *ibid.*, (1919); *R. C. Labour*, (1893-4)). There was little official concern about the recent decline, which took place during a more prosperous phase for the industry, until the late 1960s when the desire to boost agriculture's import-saving role led to anxiety not only about the size of the labour force but also its quality in terms of technical expertise (EDC for Agriculture, (1972), 2).

Another reason for 19th-century concern was that industrial and craft workers were also leaving rural areas for the towns. It has been calculated that over 4.5 million people migrated in this way between 1841 and 1901, the heaviest outflow being 1881-91 (Lawton, (1967), table 2). Since the second world war, private car ownership has enabled both commuters and the retired to reverse the flow, resulting, for some villages in the 1970s, in the first population gains since the 1880s or earlier (Blunden et al, (1985), 185-6).

Agricultural workers in both periods were among the lowest paid; as a proportion of industrial earnings, their pay varied from 49% to 56% between 1850 and 1910, and declined from a peak of 69% in 1954 to 59% in 1971 (Newby, (1979), 35, 172). The political muscle of farm workers was weak - most did not acquire the vote until 1884 (Newby,



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(1987), 135) and agricultural trade unions have not been an effective force in wage bargaining (Newby), (1979), chap. 4).

Rural housing in the 19th century was often of appalling quality (Gauldie, (1974), part 1) compared with the durably constructed, weatherproof new houses in the growing towns which, by the later 19th century, were increasingly provided with mains water and sanitation. More recently (in 1951), in the county of Herefordshire there were considerable differences between household amenities in the towns and those in the countryside. In the municipal boroughs and urban districts of the county 6% of households had no piped water, but in rural districts the figure was 52%. For those without a water closet the respective figures were 3% and 66%, and without a fixed bath 34% and 68% (1951 Census, *Printed Reports*). As late as 1981 the proportion of 'unfit' rural properties (assessed by structural condition and presence of basic amenities) was higher than in towns and conurbations (McLaughlin, (1986)).

Over half of farm workers (in 1972: Newby, (1979), 180) live in tied houses which they lose if the job terminates; a survey completed in 1985 showed that, on average, 40% of private rented housing in rural areas was job-tied, rising to 64% in some areas (McLaughlin, (1986)). In the owner-occupied sector, competition from commuters and the retired for a supply of houses limited by planning restrictions forces prices beyond the reach of low-income households.

Turning from sociological factors to the effects of technological change on farm labour, both periods were characterised by the increasing replacement of labour by machinery, with consequent increases in labour productivity. In 1861, only 6% of the grain harvest was cut by mechanical reapers, but this had risen to 80% by 1900 (Grigg, (1982), 113). In the last half century the complete replacement of farm horses by tractors has not only enabled more acres to be worked per man but has cut out the long hours spent tending horses (FIG. 2). Combine harvesters, of which there were fewer than a thousand in 1942, numbered forty-five thousand in 1984 (M.A.F.F. (1966); *Agric. Stats.*).

FARM LABOUR IN TWO COUNTIES IN THE NINETEENTH CENTURY

A. Farming in the two counties, 1875-95.

Information about 19th-century agriculture may be gained from official statistics. Although first collected in 1866, the early years are considered unreliable (Best et al, (1962), chap. 2) therefore FIG. 3 is based on 1875 data. The pastoral nature of Hereford and Worcester is evident, but the proportion of arable is similar for both counties in that approximately 25% of arable is devoted to tillage crops other than cereals.

The country as a whole shifted from arable to livestock farming during the Great Depression (Table 4).



FIG. 2 Total workers, agricultural horses and tractors in Great Britain, 1921-65. Source: adapted from M.A.F.F. (1968), Chart X.



Table 4.	Gross output of English agriculture,	1876-98
	(selected products, £m.)	

	-	
	1867-71	1894-98
wheat	28.44	7.64
barley	12.62	7.54
total arable	65.43	41.47
beef	14.59	16.02
mutton	14.60	12.59
pig meat	9.59	10.52
milk	15.40	20.29
poultry & eggs	3.50	7.00
total livestock	64.30	70.78

Source: from Horn, (1984), 17.

Hereford and Worcester followed the national trend by increasing temporary grass at the expense of tillage but Cambridge showed relatively little change (Best et al, (1962), chap. 3). Within this differing response, however, both counties increased their acreage of non-cereal crops (Table 5).

Table 5. Orchards, market gardens, hops and small fruit, 1875-95 (Ancient counties, '000 acres.)

		1875		1888		1895		
	0	mg	h	sf	0	mg	h	sf
Cambridge	1.1	0.6	-	1.4	2.7	2.0	-	2.6
Hereford	24.1	0.1	6.0	0.2	26.5	0.2	7.6	0.8
Worcester	13.7	1.5	2.5	1.4	19.7	5.6	4.0	3.1

n.b. small fruit not separately recorded in 1875.

Source: Based on Orwin et al, (1964), 273.

B. Farm labour losses 1851 to 1891.

In 1871, both counties had more men per 1,000 acres of crops and grass than was typical of England and Wales (using 1871 labour data and 1875 crop returns: England and Wales 34.4; Cambridge 46.7; Hereford and Worcester 60.7) suggesting that both counties had by this date a considerable acreage of labour-intensive crops. The fact that between 1851 and 1871 Hereford and Worcester lost labour at a greater rate than either Cambridge of England and Wales (Table 6 and FIG. 4) may indicate that the former county had a surplus of labour at this time. However, the increasing cultivation of labour-intensive crops such as fruit and hops did little to counteract this steeper decline as the notoriously sea-



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sonal labour-demand peaks of these crops could, in the new railway era, be easily supplied by casual labour from farther afield.

This supposition is to some extent borne out by the fact that from 1951 to 1985 regular male labour per 1,000 acres of crops and grass was almost exactly the same in Hereford and Worcester as for England and Wales, despite the fact that 35% of the country's hops were grown in the county (in 1970: Coppock, (1976), 163).

Table 6. Farm Workers in two counties, 1851-91.(male farm servants, agricultural labourers, horsekeepers only.)
(males, all ages, total numbers.)

Registration Counties	1851	1861	1871	1881	1891
Hereford + Worcs.	34685	30531	26381	25219	21679
Cambs + Hunts	35206	34361	32279	28523	28500
% change per decade -	Hfd & Worcs	-12.0	-13.6	-4.4	-14.0
-	Cambs & Hunts	-2.4	-6.1	-11.6	-0.1

Source: Census of England & Wales, Printed Reports.

FARM LABOUR IN TWO COUNTIES IN THE TWENTIETH CENTURY

A. Farming in the two counties, 1951 to 1985.

During the last forty years, both counties changed the balance of their cropping (FIGS. 5 and 6). Hereford and Worcester's proportion of arable scarcely increased but cereals increased their share of the arable at the expense of other crops. Hops in particular declined from 2,766 to 1,786 hectares between 1951 and 1985, a reduction of 35% (Wigan Richardson & Co., (1952) and (1985)).

Cambridge, by contrast, increased arable at the expense of permanent grass, and cereals at the expense of temporary grass. Non-cereal crops (sugar beet, potatoes, oilseed rape) in Cambridge in 1985 still accounted for nearly 30% of the arable acreage, however, against only 20% for Hereford and Worcester.

Table 7. Proportion of workers regularly engaged on various activities in 1968.

Work with:	East Anglia (incl. Cambs.)	West Midlands (incl. Hfd. & Worcs.)
dairy & beef cattle	37	79
sheep	4	31
pigs	28	36
arable crops	81	68
grass & grass crops	35	69
outdoor market garden	6	11
fruit	11	18
hops	<i>2</i>	5

Source: Selected from EDC for Agriculture, (1972), table 74.







Cropping changes 1951 to 1985: arable and permanent grass as % of total crops and grass. Source: Agricultural Statistics.

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grass

permanent

arable

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Source: Agricultural Statistics.

B. Farm labour losses 1951 to 1985.

In view of their differing agriculture, it seems remarkable that the decline of male labour in both counties is exactly in line with the national trend (Table 8 and FIG. 7). It would seem, therefore, that the national influences already noted have far greater bearing on the state of farm labour than regional factors. Table 8 and FIG. 7 suggest that, rather than employing a small surplus to cope with seasonal variations in workload, farmers are increasingly relying on part-time and casual labour, especially female. As the Agricultural Returns are collected on 4 June the differing peaks for the two counties suggest late or early seasons for particular crops important in the two areas.

The amalgamation of the former counties of Herefordshire and Worcestershire has obscured Herefordshire's special role in the employment of part-time, seasonal and casual workers. Between 1949 and 1965, male and female workers in this category fell by 10% for England and Wales as a whole. In the old county of Worcestershire the fall was 4%; in Herefordshire there was an increase of 27.8%, higher than in any other county. This suggest the cultivation in Herefordshire of a specialised crop, with a high labour requirement in early June. Hop-growing seems to be the most likely reason - Herefordshire has more than double the hop acreage of Worcestershire (Wigan Richardson) and training the young plants, normally carried out by women casual workers, usually continues into June.

Table 8. Farm Workers in two counties, 1951-85. (total numbers.)

		(total numbers.)					
	1951	1961	1971	1981	1985	1991	
male, regular,							
whole-time.							
Heref. & Worcs.	16315	11525	6020	4186	3799	*3285	
Cambridge	19516	13624	7282	4389	4063	*3619	
female, part-time,							
seasonal, casual.							
Heref. & Worcs.	3640	3989	4491	3834	3795	*3737	
Cambridge	3541	4428	4228	3323	3198	*3019	
% change per decade.							
Male - Heref. & Worcs.		-29.4	-47.8	-30.5	***	*-21.5	
- Cambridge		-30.2	-46.6	-39.7		*-17.5	
female - Heref. & Worcs.		+9.6	+12.6	-14.6		* -2.5	
- Cambridge		+25.0	-4.5	-21.4		* -9.1	

* projected at same annual average rate of change as that for 1981-5.

Source: M.A.F.F. Agricultural Statistics.

CONCLUSION

grass

The study has established that the number of regular agricultural workers fell at a far greater rate in the period from 1951 to 1985 than during the years 1851 to 1891. It has also shown that, judging from a comparison between counties in the West Midlands and in East Anglia, regional factors may have had some influence on the rate of labour loss in

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Source: Tables 3 and 8.

the 19th century, but were unimportant in the 20th century. Regional factors do seem relevant, however, in determining the level of part-time, seasonal or casual labour.

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APPENDIX

Comparison of Administrative, Registration and New Counties. (hectares.)

	New C	New County		
	Hereford & Worcester	Cambridge		
Registration County.				
combined counties 1851	347898	314498		
combined counties 1871	381211	314742		
1851 as % of 1871	91.3	99.9		
Administrative County.				
combined counties 1951	396875	339867		
New County (1974)	390398	339032		
Reg. Co. as % of New Co.				
1851	89.1	92.8		
1871	97.6	92.8		
Admin. Co. as % of New Co.	101.6	100.2		

Source: Census of Eng. & Wales, Printed Reports.

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Paper submitted September, 1997

Reports of the Sectional Recorders Archaeology, 1998

By R. SHOESMITH

Which the growth of independent archaeological units, it is time to present the archaeological report in a slightly different format. It is considered that there is now a need to have a short published report on all excavations and watching briefs within the county. This follows from the implementation of Planning Policy Guidance 16 (PPG 16) which lays a duty on developers to provide archaeological information in the form of evaluations, excavations and watching briefs, if so directed by the County Archaeological Service through the planning process. Full reports on these projects are kept in the records of the County Archaeological Department but, where possible, a short note will be included in the *Transactions*.

During 1998 *Herefordshire Archaeology*, the County Archaeology Service for Herefordshire was established with Dr. Keith Ray as County Archaeologist. The creation of other posts such as Archaeological Adviser, Sites and Monuments Record Officer and Archaeological Projects Officer are an integral part of this development. In August, the County Sites and Monuments Record was disaggregated from the former joint county SMR and is presently based in Leominster. I am sure that all members of the Woolhope Club appreciate the sterling work that this new organisation is doing and wish it well.

ARCHAEOLOGICAL EXCAVATIONS LTD

In the following reports reference is made to the number of the report published in the Hereford Archaeology Series (HAS) and to the author of that report. Copies are available in the Herefordshire Public Library in Broad Street.

At Hereford Cathedral (SO 510398) a detailed drawn record and analysis was produced for the fabric of the external faces of the Lady Chapel prior to its restoration. The Lady Chapel is recognised as one of the finest Early English buildings of the early 13th century. The E. end of the Lady Chapel was radically restored by Lewis Cottingham in the 1840s with the almost complete replacement of the outer skin of the medieval masonry. The evidence from the recording suggests that, despite the radical nature of the rebuilding, the overall design of the original was recreated in the new, based on careful observation and, presumably, accurate recording at the time (Morriss & Shoesmith, HAS 307).

This was followed by small excavations adjacent to the E. end of the Lady Chapel. Two trial pits and a radar survey were designed to determine the cause and nature of a hollow and a hole which had appeared close to the E. end of the cathedral. The first identified a decayed sandstone slab sealing a void, the second uncovered a lead-lined coffin in a brick-lined vault. The occupant was Mrs. Mary Powell, aged 92, who died in 1823 (Boucher & Eisel, HAS 352).

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A further excavation adjacent to the E. end of the Lady Chapel revealed a large number of burials just beneath the surface (Hoverd, HAS 359).

During the conservation of the Cantilupe Shrine in the N. transept aisle, a smallscale excavation was undertaken beneath this medieval monument. The shrine was recorded *in situ* and an area of 4 m. by 2.8 m. excavated. The surviving part of the earliest foundation indicated that the shrine may have originally been situated against the E. wall of the N. transept aisle and later moved westwards, possibly in two stages (Williams, HAS 360).

Also adjoining the cathedral, a watching brief during repairs for an electric main revealed surfaces of probable medieval date which match the layers identified in a previous exercise above. Below these was a feature containing a sherd of 10th-century pottery. (Vyce, HAS 391).

Two watching briefs were carried out at the cathedral when no archaeological deposits were disturbed. They were Welsh Water repairs in the Lady Arbour (Vyce, HAS 397) and a watching brief on a trench for water to the fountain in the Vicars Choral College (Vyce, HAS 402).

During the year there have been several excavations and watching briefs adjacent to both the Saxon and medieval defences of Hereford. One site, at no. 8 St. Peters Street (SO 511400) lies above the Saxon defensive ditch. Observation of engineers' holes revealed silty gravels which may be associated with the fill of the ditch, and stake-holes associated with a piled chimney base. Environmental remains from 15/16th-century silts in the Saxon ditch provide evidence for a clean, slow-moving or stagnant watercourse (Hoverd, HAS 347).

Repair works to a gas main directly over the medieval defences and close to the northern portion of Eign Gate at the junction of Victoria Street and Bewell Street (SO 507401) revealed typical deposits associated with dumped material used in the construction of the medieval rampart. The results also demonstrate that the defensive line may have taken advantage of a natural ridge, thus perhaps explaining why the line to the N. of Eign Gate steps out westwards (Hoverd, HAS 349).

A sewer repair trench in Aubrey Street, adjacent to the line of the King's Ditch (SO 509399), revealed alternate layers of gravel and a peaty organic material. Radiocarbon dating suggests that the sequence of deposits were formed between c. 1900 B.C. and c. A.D. 1170. Pollen analysis and pottery dating support this range of dates. From within the upper layers of the deposits encountered, leather artefacts and a shale ring were recovered (Boucher & Hoverd, HAS 369).

A sewer repair trench in East Street (SO 509400) to the rear of the Saxon defences provided a section through the base of the rampart and what are probably subsequent road surfaces behind it. Pottery dates the sequence of layers and surfaces to between the 10th and 13th centuries (Hoverd, HAS 370).

At the former Godsell's Garage, Bath Street (SO 513401) three evaluation trenches were excavated over the line of the City defences. Information was recovered concerning make-up of the rampart, the buried ground surface below the rampart and the medieval

land use on the tail of the rampart. Post-medieval truncation of deposits was also recorded. A series of medieval refuse pits along the tail of the rampart may well represent the burial of rubbish at the end of burgage plots (Hoverd, HAS 382).

At Greyfriars Surgery (SO 505397), a watching brief identified gravel horizons containing medieval pottery, although excavations were not deep enough to confirm whether these were part of the defences or not (Williams, HAS 345).

Improvements were carried out at Greyfriars Bridge (SO 506395) and whilst no archaeological deposits were observed during the watching brief of the A49 reinforcement work, actual records of piling provided an understanding of the topography of the underlying geology (Vyce, HAS 403 & 410).

South of the river at 4a St. Martin's Street (SO 508395) a borehole survey revealed a number of silty deposits some of which may well be associated with the defensive ditch that enclosed St. Martin's suburb (Hoverd, HAS 401).

A little further S. at 20 St. Martin's Street (SO 508395), an archaeological watching brief revealed later medieval pits and layers to the rear of the property. Evidence for an 18th-century boundary wall was also uncovered (Boucher, HAS 366).

There has also been a considerable amount of work within the city. At the Left Bank Village (14-9) Bridge Street (SO 508397), a number of archaeological watching briefs were carried out during underpinning and engineers trial excavations. They revealed a rich assemblage of 13th-century and later features and deposits containing exceptional environmental preservation. A wheel hub or cog from the site has provided a dendrochrono-logical date from the mid-12th century (Boucher, HAS 363 & Lewis, HAS 381).

On the opposite side of the road, a watching brief was carried out on a drainage trench on the S. side of the Black Lion Inn, Bridge Street (SO 508397). The remains of a small portion of (pre-17th century?) wall were identified at the W. end of the trench (Williams, HAS 386).

At 51 Commercial Street, (SO 511401), engineers' holes within this property revealed probable 15/16th century deposits from which environmental evidence indicates domestic tipping (Hoverd, HAS 355).

A watching brief at 19-23 Friars Street (SO 507399) revealed no significant archaeological features or deposits (Hoverd, HAS 375).

At Kwik-Fit, Blueschool Street (SO 512402), a watching brief did not reveal any deposits of archaeological significance (Lewis, HAS 376).

A watching brief at 39-43 St. Owen Street (SO 513399) identified the depths of deposits helping the understanding of the topography and geology of Hereford. No archaeological features were encountered (Williams & Vyce, HAS 387).

On the site of Hereford's new County Hospital (SO 515402), archaeological research and excavations were carried out in advance of the works. The new hospital building is near to the site of St. Guthlac's Priory founded in A.D. 1143. The work created a deposit model for the site and coordinated sources from previous desk-top assessments. A number of medieval pits dating from the Dissolution were uncovered. Post-medieval buildings and

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earlier features were located near the junction with Stonebow Road. A peat deposit which covers a large proportion of the Eign Brook Valley was found to be of 18th-century or later date (Boucher, HAS 389 & 394; Vyce, HAS 385).

A watching brief was carried out at the Stonebow Unit on the junction of Commercial Road and Stonebow Road (SO 507397) which also lies near the re-foundation of St. Guthlac's Priory, but the ground had been recently disturbed. Some fragments of monastic masonry were recovered (Williams & Mays, HAS 405).

A watching brief was carried out during the foundation work for the new Postal Sorting Office (SO 515405), which is built on the site of the former Hereford Canal Docks. The work revealed some evidence for earlier cuts on the site but these could not be conclusively linked to the known previous industrial use of the site (Vyce, HAS 395).

At the former Toyota Centre between Mill Street and Green Street, (SO 514396), an evaluation was organised prior to a residential development for Neil Grinnall homes. Three evaluation trenches were excavated in an attempt to identify the line of the Saxon road that had been postulated in this area. The excavation revealed a gravel deposit (believed to be natural in origin) and finds of the 18th century or later in date (Williams, HAS 367, Hoverd, HAS 348).

At the site for the new Magistrates' Courts in Bath Street (SO 513401), engineers' tests comprising three boreholes and seven trial trenches were monitored by archaeologists. No significant archaeological deposits were identified (Williams, HAS 383).

Archaeological Investigations Ltd. has also been working in the market towns and countryside of Herefordshire.

In Leominster, further evidence came from the former Poultry Packers Site at the junction of Bridge St. and Mill St. (SO 496595). A mill stood outside the N.E. corner of the site and leats associated with it in the 18th and early 19th centuries bounded the N. and E. sides of the site. A further unknown channel of possible pre-Conquest date runs from Bridge Street eastwards through the southern part of the site (Williams, HAS 372).

Further work at 43 Etnam Street, Leominster (SO 498589) only identified a series of Victorian pits (Boucher & Williams, HAS 379).

As part of the on-going alterations to Upper Hall, Ledbury (SO 713378) a series of archaeological watching briefs was undertaken. A number of post-medieval garden features were uncovered along with the vaults of some of the cellars (Williams & Vyce, 407; Rouse, HAS 380).

A watching brief at Credenhill Sports and Social Club (SO 446429) revealed evidence for the construction of the railway. There were no other finds (Hoverd, HAS 373).

At Castle End Farm, Lea (SO 656221) a documentary assessment was carried out as part of an application for planning permission to erect a telecommunications mast (Boucher, HAS 392).

In Lingen, on land between Court House Farm and the Royal George (SO 366671), an earthwork, magnetic and resistivity survey were all carried out in advance of an application for planning permission. The site contained earthwork features along the main road which would have lead to the motte and bailey castle. The resistivity survey identified possible solid structures beneath these indicating that the remains of medieval buildings lie along the road frontage (Boucher, HAS 393).

David Jones of Manor Farm, Bredenbury (SO 613560) commissioned an archaeological survey of earthwork features within his farm estate. These comprised platforms and holloways on two sides of a stream valley. An earthwork survey of the entire site was carried out along with selected areas of resistivity survey. Combined with the documentary information about the site it could be that these are a rare survival of medieval smallholdings which had not been amalgamated into Bredenbury Manor Estate (Boucher, HAS 400).

A series of geophysical surveys and trial excavations were carried out at Ford Abbey Farm, Pudleston, (SO 564585) for Dr. and Mrs. Heijn. The geophysical survey methods included magnetic, resistivity, electromagnetic and ground penetrating radar. The results helped to map out water features and identified the presence of structures. A basic earthwork survey of the site was also undertaken. A scheme of trial excavations revealed sequences of floors and surfaces within the farm buildings and yards. On the basis of pottery recovered these date from the 12th century through to the present day. A stone-lined moat was also partly excavated and the deposits within this feature demonstrated good preservation of environmental remains (Boucher, HAS 325; Hovered, HAS 333; Crookes, HAS 399).

At St. Mary's Church, Byton (SO 378640) a watching brief during underpinning of the organ transept revealed the remains of six articulated burials (Williams, HAS 356).

A survey and analysis of the bell tower at St. Mary's Church, Pembridge (SO 392581) was commissioned by English Heritage in light of its recent restoration. The work included a dendrochronological analysis. The results established that the four corner posts, which were the original surviving elements of the tower, dated from the 13th century, with visible mortices demonstrating the pattern of side framing. The bell frame was inserted in the 16th century (Eisel & Morriss, HAS 364).

Recording during the restoration of the Knights' Templar's round nave at St. Michael's Church, Garway (So 455225) was carried out to assist the conservation works. A new plan of the nave was produced showing the state of the monument (Rouse & Williams, HAS 390).

Inevitably there are watching briefs where it turns out that no archaeology is present. Even so, reports have to be produced and are included in the following list. Heath House, Leintwardine (SO 382764) (Vyce, HAS 377); Castle Falls, Kilpeck (SO 446304) (Hovered, HAS 384); Castle Weir Farm, Lyonshall (SO 332565) (Williams & Vyce, HAS 388); 12 High Street (Pig's Lane), Ross-on-Wye (SO 599241) (Williams, HAS 371); Plots 1 & 2, Barrack Hill, Kingsthorne (SO 505325) (Williams, HAS 344); Merry Hill Farm, Belmont, (SO 485371) (Williams, HAS 346); Plough Farm, Leintwardine (SO 403746) (Boucher, HAS 368); Old Market Hall, Ross-on-Wye (SO 599241) (Hoverd, HAS 314); Porter's Mill Close, Leominster (SO 496596) (Williams, HAS 374).

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ARCHENFIELD ARCHAEOLOGY

A desktop survey in Bastion Mews, Hereford, (SO 513401) was commissioned by Mr. Zane Sutton-Thompson to ascertain the known historical and archaeological information available about the site. The objective of the survey was to identify all recorded references to the history of the site, with the aim of producing an analysis of the likelihood of deeply stratified archaeological deposits surviving.

The survey comprised a full historical and archaeological review of the published and unpublished literature, cartographic, pictorial and photographic sources relating to the site. This was drawn from a search of the Sites and Monuments Record (Hereford and Worcester County Council at the time the research was conducted), the National Monuments Record, Hereford Record Office, Hereford Library and Museum, and the Map Room of the British Museum. All details relating to the history of the site discovered during the conduct of the research and full bibliographic references are given in the appendix to the desktop survey

In summary, the site is potentially an area of high archaeological interest due to its proximity to the line of the City Wall and the late-12th century defences, with some possibility of Saxon occupation being encountered in the lower strata. However, it seems likely that much of the earlier archaeologically sensitive material will have been destroyed by ground disturbance in the late Victorian and early modern period. The most likely archaeological evidence to have survived would be the gravel tail of the 12th-century rampart, possibly containing evidence of the construction of the City Wall. This may seal occupation layers dating from before the Norman occupation of the City to the later 12th century. Some features or deposits relating to the use of the site as open courts associated with the City Gaol may also be present in the upper layers.

At a later date, the site owner wished to identify the extent of any possible soil contamination that may have arisen from the presence of buried fuel tanks on the site. To achieve this a borehole survey was required, but because of the proximity of the site to a Scheduled Ancient Monument (Hereford 124), and because it lies within the Area of Archaeological Importance (as defined by the Ancient Monuments and Archaeological Areas Act, 1979), Mr. Dutton-Thompson commissioned an archaeological watching brief. It was hoped that this would provide an assessment of the likely survival of substantially undisturbed archaeological remains in the area of potential disturbance. The boreholes were sunk with a percussion cap rig after removal of the concrete yard surface. The cores retrieved from the boreholes were analysed, drawn and sampled. They showed that substantially undisturbed and potentially important archaeological remains survived. On examination the cores revealed that medieval surfaces, deposits and structures survive below the modern yard surface to a maximum depth of 3 m. in places. In particular the 12th-century gravel rampart was identified, sealed by a layer of 13th-century material. A single sherd of glazed medieval roof-tile (of fabric A7b) was recovered from this layer.

At Hampton Court, Hope-Under-Dinmore, (HWCM 6556), Mr. Ed. Waghorn (site manager of Hampton Court) on behalf of Sola Scriptura, commissioned an archaeological watching brief of the excavation of the foundations of the gatehouse. The machine excavation of the foundations was monitored by an archaeologist, and the findings recorded by means of photography and measured drawings. A buried wall was uncovered which seems to cut across an earlier feature. A very well-preserved section of metalled trackway or yard was also uncovered. A very limited number of finds were present, but a brick was found in the wall and there were two glazed floor tiles. After analysis these have been identified as probably being of late medieval or early post-medieval date.

Also at Hampton Court, an archaeological watching brief was undertaken during the excavation of a pool within the walled garden (SO 520525). The excavation was conducted using a mechanical excavator between 23 and 25 September 1998. The excavation was monitored by an archaeologist and a full record was kept of the strata revealed by the work. No archaeological features or finds were observed dating from before the 19th century. This confirms that the site was in use as open pastureland before the Arkwright family built a walled garden on the site in the 19th century.

BORDER ARCHAEOLOGY

Border Archaeology was commissioned to undertake in April 1999 a 'walkover' and GIS programme in woodland on the Little Doward, Ganarew (close to the border between Herefordshire and Monmouthshire). The 'walkover' included the recording at least 88 new archaeological sites within 83 hectares of woodland. Sites included at least 50 post-medieval boundaries (dating mainly to the 18/early 19th centuries), medieval and post-medieval trackways and holloways, boundary markers, industrial sites (including quarries and one tram road) and, within the northern part of Little Doward Iron Age hill-fort, a well (the date of which is unknown).

Surveying of each site included tape and off-set from known static points as well as the use of GPS (Global Position Stationing). (Sites were valued using criteria set within Annex 2 of PPG 16).

In addition to the archaeology, the flora distribution within the woodland was also recorded. This component of the 'walkover' was considered important in understanding the chronological sequencing of past woodland management schemes which appear to span some 200 years.

A watching brief and limited standing building recording was undertaken for a derelict dwelling known as Ty'n-y-Gwynt (SO 294379), located within the parish of Michaelchurch Escley in S.W. Herefordshire. Ty'n-y-Gwynt is designated a Grade II listed building. The building, formerly a dwelling, is constructed of sandstone walling and incorporates a number of substantial timbers. The stone walling appears to date from the 17th century. However, within the internal fabric are a series of four cruck truss and associated purlin timbers which probably date to the 14th/15th centuries.

The four cruck timbers are spaced at approximately 4 m. intervals. Each truss is made from single oak blocks. At the apex of two truss members, the blades are overlapped not jointed. Two surviving purlins are located within the western roof section. Both are joined over the first, second and third trusses using scarf-jointing. All four trusses have had their main tie members removed. Prior to floor excavation, the height between the ground-floor level and the lower tie member for all four trusses was approximately 1.65 m.

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On the third and fourth trusses, the collars are in place. Between the first, second and third trusses are a series of shortened wall-plates. These are exposed but not tied into the trusses and are therefore probably not contemporary with the truss timbers. The wall-plates extend along the E. and W. elevations into the southern section of the house.

The watching brief revealed no archaeological features or structures but did expose the bedrock which had been levelled in order to construct the dwelling.

A watching brief and limited standing building recording was undertaken at Fenhampton Farm, near Weobley. The programme of works included a limited photographic record and a drawn survey of a flagstone floor. In addition, a series of test pits were excavated within strategic areas of the house in order to assess any earlier or additional phases of building.

Fenhampton Farm is designated a Grade II listed building (SO 391503) and is described as a two-storey, timber-framed building supported by a sandstone foundation. The roof was, until recently, covered by stone tiles. According to the then Hereford and Worcester County Council Archaeological Service Sites and Monuments Record, evidence suggests the house was constructed of three phases with the central and northern sections dating to the 17th century. It now appears that the central section of the house is the first of five phases of building which may date from the mid-to-late 16th century.

Evidence for this early date may be reflected with the presence of a closed fenestral located within the internal walls(s) that separates Phase I from Phase II. This feature, constructed within the perpendicular style, comprises of an unmoulded angular oak surround with a single mullion. The frame sits on a large horizontal timber and stone wall support.

The S. western section of the building is probably late 18th century. Elsewhere, a number of small lean-to extensions were later added and limited internal alterations carried out. A large outbuildings complex (Phase V) to the W. of the farm-house is probably contemporary with the extension of the house in the early 19th century. This phase of building also incorporates the present kitchen and adjacent scullery.

At the front of the building (E. facing elevation), a unique two-storey gallery porch is supported by decorative external timber-framing. The jettied porch appears to be tied into the main fabric of the earliest building phase and can be regarded as a separate phase of building, but dating to the late 17th century.

Contemporary with the laying of the flagstone floor was a series of substantial internal partition walls (constructed of lath and plaster). Within the principal room are two internal partition walls. Both are supported by a line of single unfrogged bricks which date roughly to the mid-19th century. In some areas, flagstones were laid beneath the partition walls, suggesting that the first phase of building was possibly one large room with no entrance hall.

The watching brief included the excavation of six test pits located directly beneath the flagstone floor to a depth which is conducive with present building regulations concerning the re-instatement of a concrete membrane and damp coursing. After the initial survey of the stone floor, the stone slabs were removed carefully by hand. Selected excavation was undertaken to a required depth (less than 0.2 m.). This depth was maintained across the site. No archaeological features or structures were exposed during this part of the programme.

THE ARCHAEOLOGICAL SERVICE OF WORCESTERSHIRE COUNTY COUNCIL

In April 1998 local government of the two counties was reorganised and both now have excellent in-house archaeological services. The Field Section of the former joint county council became part of Worcestershire County Council. Over the quarter of a century that the council had undertaken fieldwork in both Herefordshire and Worcestershire an enormous expertise in the former's archaeology has been built up, and many members of staff have both research interests in, and an affection for, Herefordshire. The Service will continue to contribute to an understanding of Herefordshire's unique archaeology and looks forward to working with Keith Ray and his team.

A watching brief was undertaken at the Village Hall, Bishop's Frome (HSM 24376) on behalf of Bishop's Frome Parish Council. On the slightly higher ground of the N. half of the site, stripping revealed an E. to W. linear gully, possibly a field or property boundary, which may be of medieval, or more likely, prehistoric date. The stripping also revealed two roughly contemporary cremations of probable prehistoric date.

A watching brief was undertaken at Croft Castle visitor facility (HSM 30001) on behalf of the National Trust. This identified a number of features associated with the occupation of the site from the 16th century onwards. The extensive restoration undertaken on the castle and grounds in the 18th century is represented by the construction of the Gothic-style curtain wall. The wall was used further in the 19th century when a craft workshop was built against it. The occupation of the area in the early medieval period, documented in *Domesday* is not represented in the archaeological record. Ridge and furrow visible to the N.E. does not extend into the development area.

A watching brief was undertaken at Camp Cottage, Dinedor (HSM 1278) on behalf of Mr. and Mrs. D. Eckley. This identified a number of features thought to be associated with the occupation of the Iron Age hillfort. The line of a ditch was observed with a lower fill of unknown date. This feature is on the assumed line of the outer ditch at the base of the rampart and seemed to be backfilled in the late post-medieval period. A small section of a cut feature was revealed in foundation trenches. This feature was probably a pit or shallow ditch, with lower fills containing pottery dated to the Middle Iron Age. The upper fill of this feature contained Roman Severn Valley ware, suggesting activity after the abandonment of the hillfort. The detection of features outside the enclosed area of the hillfort is of considerable interest.

A watching brief was undertaken at Flanesford Priory, Goodrich (HSM 26960) on behalf of LSI Group Holdings. The watching brief, which forms the third and final part of a staged project, was designed to provide information on the impact of a new building on the known archaeological site. The site (HSM 832) lies within the precinct of Flanesford Priory, which was founded in 1346 and dissolved in 1536. Significant archaeological deposits, as with the prior evaluation, were encountered at an average depth of 0.3 m. below modern surface levels. The main deposit encountered was a substantial layer (up to
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0.5 m. deep) of material apparently dumped on the site to raise and level a platform for the priory. No other features except those of modern date were identified.

A watching brief was undertaken at Ledbury Park, Ledbury (HSM 23164) on behalf of Marlborough Land Developers Ltd. This revealed a low level of archaeological activity on this site. There was a lot of modern and 19th-century disturbance caused by drains and foundations and the terracing of the slope for the construction of a recently demolished warehouse. No evidence was seen for archaeological deposits earlier than the 19th century beyond the western edge of the site. One linear feature was seen along the western edge, which showed some cess staining and was probably 17th century in date. This, together with a cess-pit, seen during the earlier evaluation, represent the eastern limit of domestic habitation, probably associated with Ledbury Park house, on this site.

A watching brief was undertaken at the Feathers Hotel, Ledbury (HSM 25094). The site was located to the rear of the hotel and involved the excavation of a hole for a swimming pool and foundation trenches for an extension and garden walls. The earliest deposits on site, dating from the 12th to 13th centuries, relate to garden or horticultural activity associated with a medieval tenement plot of St. Katherine's Hospital. This area, dating from the 12th century, is one of the oldest parts of Ledbury. The only other deposit seen was a layer of soil associated with garden or horticultural activity dating from the 18th to 19th centuries which was cut by 19th-century stone walls. These walls were property boundaries which had no earlier foundations or precedents on the same line.

An archeological evaluation was undertaken at 34-6 Watling Street, Leintwardine (HSM 24437). The outer and middle ditches of the Roman defences were identified in the evaluation trench. The evaluation also revealed evidence of Roman ovens in this area together with artefactual evidence for occupation between the 12th and 15th centuries.

A watching brief was undertaken at 3-5 Etnam Street, Leominster (HSM 25987) on behalf of G. P. Thomas Ltd., building contractors. No features or deposits earlier than post-medieval were identified during the project, suggesting that the W. end of Etnam Street may have been relatively undeveloped in the medieval period. The area seems to have existed as plot tails to properties fronting Corn Square until the construction of the 17th-century timber-framed building fronting Etnam Street. Pits and a stone-lined well indicate the area consisted of tenement plots to these buildings and possibly to a row of cottages built in the latter part of the 17th century.

An evaluation was undertaken at the Longtown Outdoor Education Centre (HSM 26824) which located the medieval town ditch.

A watching brief was undertaken at Mordiford Bridge (HSM 915) during further repair works. The recording identified an earlier alignment of part of the eastern end of the bridge, which is related to a former road surface recorded during a previous phase of recording.

A desk-based assessment was carried out for land on the western side of Brookend Street and to the N. of Kyrle Street, Ross-on-Wye (HSM 26356). The area lay within the medieval town of Ross and close to a possible medieval industrial area, where there was a mill and tannery in the 19th century. The site had potential for revealing significant information on the development of Ross in the medieval period and it is possible that waterlogged deposits may be found in the northern part of the site which lies near to the Rudhall Brook and a former water channel associated with the mill.

A watching brief was undertaken at the former Cottage Hospital site, Ross-on-Wye (HSM 30000) on behalf of McCarthy and Stone plc. This identified a number of archaeological layers associated with the occupation of the area during the post-medieval period. The earliest activity on the site may be in the 17th century, but is only represented by unstratified finds, rather than any archaeological deposits. Deposits relating to the possible occupation of the site in the 18th century were observed, with substantial activity of an uncertain nature in the 19th century, prior to the construction of the Cottage Hospital in 1879. The area is identified on the 1840 tithe map as 'Croft's Field,' suggesting that the land was used for horticultural purposes, with the possible existence of a dwelling on the site. The archaeological evidence supports this.

A watching brief was undertaken at Wellington Quarry, Marden Lane, Wellington (HSM 5522) as part of an ongoing project in response to gravel extraction. The most significant find during two phases of stripping undertaken during 1996 was an intact grave deposit of the Late Neolithic/Beaker period. The artefactual assemblage was the richest of its period yet discovered in the County, consisting of a copper knife, shale wristguard, four barbed and tanged arrow-heads, three arrow-head blanks, and five flint knives. The inhumation was accompanied by a complete Maritime Bell Beaker with Herringbone All Over Ornamented decoration. However, the bone preservation was very poor, the only recognisable elements being tooth enamel; the position of the body was not identifiable, though the size of the grave cut suggests a crouched inhumation.

A probable post-hole containing two flint flakes and a considerable quantity of Neolithic Peterborough ware was located close to the section at the southern end of the stripped area. Five other features in the immediate area were considered to be contemporary, but only two contained dating evidence (pottery) and this was too decayed to be recoverable.

Three ditches, backfilled in the early to mid-Roman period and containing a quantity of Iron Age pottery, are believed to represent elements of a field system, but also indicate occupation in the near vicinity and support the evidence for re-occupation of the site in the late Iron Age following a long period of flooding and alluviation.

Several other features, including pits and post-holes, were identified along the edges of the stripped area. All were sealed by a thick layer of alluvium similar to that over the burial, and they may be broadly contemporary with it.

This season of fieldwork has demonstrated the presence of significant archaeological deposits to the S.W. of Wellington Brook and indicates that they may continue to the S. and W. of the current quarry. A detailed report on the Beaker burial has been published (Harrison, R. J., Jackson, R. & Napthan, M., 1999 Oxford Journal of Archaeology, 18(1), 1-16)

An evaluation was carried out at Yarkhill Moat (HSM 30005) to the E. of Hereford. This revealed a medieval deposit of 12th or early 13th-century date, which was present on

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the S. and S.E. sides of the moat. This deposit was water-logged and produced evidence for diet and of the local environment. Elsewhere the fills of the moat were associated with later 18th or early-19th century *termini post* dates. The latter corresponded broadly with the documentary evidence which indicated that a building on the moat platform was finally abandoned in 1804. A large dump of demolition material in the moat probably also corresponds to this episode or site abandonment.

Watching briefs were also undertaken in the parishes of Ullingswick, Ross-on-Wye and Leintwardine all of which located no deposits or features of significant archaeological interest.

MARCHES ARCHAEOLOGY

In the following reports reference is made to the number of the report published in the Marches Archaeology Series (MAS) and to the author of that report.

At the Church of St. Bartholomew, Docklow (SO 564575), no evidence of early occupation of the site was found as a result of a watching brief on drainage works in the churchyard. The corner of a stone vault was revealed, but no other burials were disturbed (Hodgkinson, MAS 035).

At Prill Farm, Ewyas Harold (SO 386285), an evaluation excavation was carried out prior to the determination of a planning application proposing development of the site. The evaluation, consisting of three trenches within the area adjacent to the western boundary of the urban area defined in the Central Marches Historic Towns Survey, did not encounter any deposits or features of archaeological significance (Appleton-Fox, MAS 025).

On land adjacent to the Sun Inn, Leintwardine (SO 406739), the groundworks for the erection of three houses were observed but no evidence of archaeological activity was seen (Appleton-Fox MAS 029).

At 13 The Priory, Leominster (SO 498593), a watching brief was kept on a substantial programme of underpinning carried out to counteract subsidence. The house was found to be built on made ground of late 19th-century date. The holes for the underpinning did not penetrate beneath these levels (Appleton-Fox, MAS 031).

At Great Trewern, Longtown (SO 321308), building survey and a watching brief on groundworks were carried out during repair and renovation on the buildings. The stone farm-house was built around the first half of the 16th century as a three unit house, with a solar in a cross-wing and a service range flanking an open hall. In the 17th century the cross-passage was moved, a central fireplace inserted and the hall divided, providing a first floor. In the 18th century the rooms were further divided and extra accommodation provided. Ancillary buildings consist of a broadly contemporary stone threshing barn to the S. of the farm-house, with a granary and a piggery added in the 18th and 19th centuries.

The watching brief within the farm-house uncovered two former layers of flagstone flooring. Outside the farm-house it did not reveal any significant below ground deposits.

The bedrock was encountered at a depth of between 0.2 m. and 0.5 m. below present ground level (Stone, MAS 050).

During repair works to the box pews and windows at the church of St. Bartholomew at Richards Castle (SO 484702), archaeological recording of various elements within the church was carried out. Sketch drawings, photographs and notes were made of those box pews and associated structures which were to be removed and repaired. This provided a typology of the forms of the timber mouldings and of the hinges, together with notes and a photographic record of the panel forms. A new plan of the church, also showing the position of the gravestones used as flooring, was made. A rectified photographic record of selected windows was made prior to repairs. Notes were also made on the development of the church. A watching brief on the works to the drainage around the exterior of the church did not reveal any significant archaeological data. An inventory of material held in the tower was also made. A Royal coat of arms, dating from the period between 1714 and 1801 and painted on wood that was later used as floorboards, was found (Stone, MAS 041).

A watching brief on groundworks for the extension of Cherry Cottage, Westonunder-Penyard (SO 629248) produced a post-medieval horse's head but no other material of archaeological significance. The area is adjacent to the Roman settlement of *Ariconium* (Appleton-Fox, MAS 026).

The partial excavation in 1998 of a trench in and around the E. tower of Wigmore Castle (SO 409692), produced evidence of the occupation of the castle from the 13th century to the 16th century, followed by a period of abandonment and decay. To date no post-excavation assessment or analyses have been undertaken and the results presented are a preliminary interpretation which will be refined and augmented as further research is undertaken.

Natural deposits were not reached in any part of the trench as full excavation was not carried out. Within the confines of the tower, excavation continued down to a layer which has been provisionally interpreted as the top of the backfill after the construction of the tower. Outside the tower excavation stopped at a level that was determined by engineering constraints.

During the first phase of the 1998 excavations, the earliest archaeological feature uncovered outside the tower was the lower portion of the wall running between the E. tower and the gatehouse. This differed in nature from the later wall above, sloping gently outwards towards the bottom, and had been covered in render on its internal face. The earliest deposits uncovered consisted of re-deposited natural material which butted up to the lower portion of the curtain wall. This layer had been cut by a curving feature, possibly a ditch, which was itself re-cut by two pits and a shallower gully. The internal wall of the tower appeared to have been built from this level and butted the early curtain wall.

The slippage down the slope of both the E. tower and the later curtain wall, together with later robbing of the stone from the wall has removed the stratigraphic link between them, but the lower part of the internal wall is integral with the lower portion of the curving D-shaped wall of the drum tower itself.

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The original 13th-century tower had a basement room below the ground-floor chamber, no evidence of stairs or an entry at the lower level was found and it must be supposed that access was gained by a trapdoor and ladder.

A pair of post-holes running parallel to the rear wall of the tower is interpreted as forming part of a corridor linking buildings built against the curtain wall on both sides of the tower. A gravel spread whose northern limit was a straight line perpendicular to the wall was seen in the southern part of the trench and provided evidence for an early building against the curtain wall to the S. of the tower. A short-cross penny was found in the soil accumulation above this deposit. This is as yet undated with any certainty but would appear to be stylistically similar to the coinage issued during the latter half of the 12th century. Above the gravel and its associated deposits was a mortar floor occupying the same area; the northern edge of this floor was slumping as if into a decayed beam slot. This interpretation is supported by the presence of iron nails along the same alignment.

The whole area of the trench to the S. of the doorway was sealed by a thick mortar floor which had slumped quite badly. Directly beneath the floor was a badly worn coin of Edward I, providing a date at the end of the 13th century as the earliest possible date for the laying of the floor, though the pottery evidence would suggest a slightly later date. It would appear to have been kept fairly clean throughout its life though the layers above produced pottery with a date range from the 14th to 16 century. A coin of Henry VIII, from the Durham mint during the bishopric of the later Cardinal Wolsey and dating to 1523-9, was recovered from a mortar dump just above the floor.

Most of the layers above this were abandonment or destruction levels mirroring the lessening importance to the Mortimer family of Wigmore Castle in this period. In a succession of layers of rubble a number of broken 14th-century decorated floor tiles were recovered; a lot of these layers also produced fragments of medieval window glass. This is consistent with the dismantling or refurbishment of a high status building in the vicinity. Similar material was recovered from the excavation against the S. curtain wall in 1996, but the proportions were reversed. In 1996 over 200 glass fragments were found and one decorated tile — in 1998 fifteen pieces of glass were recovered and forty-eight fragments of decorated floor tile and some ridge tiles. It is assumed that the area next to the S. curtain wall was used as a dumping ground earlier in the life of the castle being further away from the main, high status buildings, with the area near the E. tower only becoming a rubbish tip late in the sequence when the main buildings were being stripped of their finery.

The second excavation of 1998 was of very limited scope, being restricted to the removal of the ridge of soil remaining against the base of the internal wall of the tower to enable the engineers to determine the level and type of any propping required. What had appeared to be a single dump of re-deposited natural on excavation turned out to be more complicated. The earliest deposit encountered was a purplish-brown gritty layer of decayed sandstone—this layer was not excavated and cannot be dated. Immediately above it was a reddish-brown gritty deposit, this was generally very thin but in places was up to 150 mm. thick. This layer was cut by a foundation trench which contained six courses of substantial masonry. The foundations butted a wall below the rear wall of the tower seen in the spring, but was bonded with a red mortar as opposed to the white mortar of the

latter. The reddish-brown layer underlay a stony greyish-brown soil which in turn was covered by another loose reddish-brown gritty deposit. Above this was a series of dumps of re-deposited natural which would appear to have been laid down during the construction of the wall as they were separated by mortar patches (Appleton-Fox, MAS 036).

WIGMORE CASTLE

It is appropriate to conclude this archaeological report with the following contribution from John Cooke, who spent much of 1998 at Wigmore ensuring that the archaeology of the castle was fully and properly recorded and, more importantly, that a basic understanding of the visible, and in some cases buried, features was achieved.

A two-year conservation project was completed at Wigmore Castle, the site having been taken into guardianship by English Heritage in 1996.

The guiding principle behind the project was that the appearance and atmosphere of the castle, that of an overgrown, romantic ruin, should be retained, and special attention was also given to preserving the fauna and flora of the site. The approach to conservation was based on minimum intervention, with dismantling and reconstruction of masonry generally being restricted to the wall tops which had been badly affected by erosion and heavy root growth. A small number of architectural features, such as window arches and fireplaces, were also restored where structurally necessary to prevent further collapse. An intensive building recording project ran alongside the conservation work, carried out by Lancaster University Archaeological Unit in collaboration with the Central Archaeology Service of English Heritage. Two excavations were also required to investigate particular structural problems in the S. curtain wall and the E. tower, and these were undertaken by Marches Archaeology. The results of this work have given us a greater understanding of the castle's form and development and this note is intended to provide a summary of the major findings in advance of full publication.

Wigmore is a large motte and bailey castle; it was established by William Osbern between 1068 and 1071, but it is more strongly associated with the Mortimers, who rebuilt and developed the castle between the late 11th and early 14th centuries. It sits on the end of a ridge running N.W. up to the high ground of the Wigmore Rolls between the rivers Lugg and Teme. It had decayed a great deal by the 16th century and suffered further from Civil War dismantling. Since then the ruins have been left to deteriorate, and much of the architectural detail has been robbed.

In every area features have been revealed by the removal of ivy and the mass of soil and vegetation on the wall tops. Excavation provided evidence for the excellent preservation of interior buildings and deposits, and for the exceptional depth of these deposits, up to 13 m. against the S. curtain wall. Limited cutting-back of vegetation within the bailey has also exposed the surface remains of a large and impressive set of buildings which, it is presumed, formed the principal accommodation within the castle; these have been recorded in some detail through a high-definition contour survey by Mr. Glynn Barratt.

The unusual oval shell keep survives for over 30 m. in length with elements of its N.W. and S.E. towers also surviving to a considerable height. A window and seat have

Botany, 1998

By PETER THOMSON

Using records held by the Botanical Society of the British Isles Recorder

am indebted to the following for the vascular plant records which they have submitted during the year: Felicity Burge (F.B.), John Davies (J.D.), Brian Gregory (B.G.), Michael Harper (M.H.), Mark Lawley (M.L.), Bill Thompson (W.A.T.).

Mark Lawley has supplied the Bryophyte records and Ted Blackwell has contributed a separate section on Fungi.

Looking back on the year the impression is that, apart from an unseasonably warm February, it was wetter and cooler than usual. Most memorable were the crippling floods of 9 May and 28 October which ensured that for parts of the year at least there was no lack of water, whilst generally low temperatures enabled the plants, once in bloom, to remain so for long periods.

Botanical activity has been concentrating on the final phases of collecting data for the forthcoming Atlas 2000 which should be published in the year 2000 or 2001.

Vascular plant records of particular interest in 1998 are as follows:-

Equisetum telmateia, Ehrh. Great Horsetail M.L. Elton area.

Purchas W.H. and Ley A. in *A Flora of Herefordshire* 1889 (P. & L.) describe the plant as 'rather rare,' Now it is almost certainly more rare as its damp habitats have often been drained.

Silene noctiflora L. Night-flowering Catchfly (B.G.) A native plant of sandy soils.

Ranunculus parviflorus L. Small-flowered Buttercup (M.L.) Occurs locally and sporadically on open ground.

Stellaria nemorum L. Wood Stitchwort (M.L.) Burrington, Deerfold and Nash Wood. Very rare in the county and found in a few Welsh sites. More common in the Pennines and Lake District.

Rumex x pratensis Mert. and W.D.J. Koch (W.A.T.) The hybrid between R. crispus L. and R. obtusifolius L. One of the commonest dock hybrids.

Pyrola minor L. Common Wintergreen (M.H.) Wigmore Rolls. First modern record. Previously known about thirty years ago from the Great Doward but not seen for many years. Three sites are mentioned in P. & L. including Berrington Ride near Leominster where it occurred in 'great abundance.' It was considered very rare in their day.

Anagallis tenella (L.) L. Bog Pimpernel (M.H.) Queens Wood, Dymock. A coppicing regime has been introduced in areas of this wood and the increased light available has led to an impressive display of flowers on this procumbent plant.

Crassula helmsii (T.Kirk) Cockayne. New Zealand Pygmyweed (M.L.) High Vinalls. An introduced plant which can become a severe pest when introduced into wild situations.

R. SHOESMITH

been discovered in the buttress of the shell keep and it now looks as if there was a largescale rebuilding of the keep in the late 13th or early 14th century. A stair within the northern buttress of the shell keep has survived well and appears to lead up to the N.W. tower on the highest point of the castle. A 10 m. high pinnacle of masonry is all that survives of this tower, but there are many features within this structure. Various windows and doors lead off a spiral stair on three levels and fragments of the ground floor internal elevations and doorway survive.

Moving down from the motte, the N.E. tower revealed a third floor with a fine window and seat, very similar to those in the S. tower. This is further evidence for a massive rebuilding campaign by Roger Mortimer c. 1300. The D-shaped E. tower has been excavated by Marches Archaeology and a number of occupation levels have been found and some good dating evidence. Despite a huge ash tree growing out of the wall top evidence of three windows has been found.

The gatehouse is the most complex surviving structure and is clearly multi-phase. There is remaining evidence for two external buttresses either side of the main arch. The gatehouse was then extended S. with the new walls encompassing the buttresses. This structure had large splayed windows and a high arch-braced timber roof. A side passage and garderobe room were also added to the E. Internally a further block extended N., the first-floor room containing a very large fireplace and decorated stone cornice. The exposure of a flue indicates a heated room on the ground floor.

There is now clear evidence for a substantial building range along both sections of curtain wall between the gatehouse and the S.W. tower. There are garderobe chutes, drainage channels, arrow loops and a window within these curtain walls. The S. tower has an inserted undercroft with double doors, evidence for a spiral stair and garderobe turret. The parapet and wall walk survive particularly well in this tower.

The S.W. tower is a curious anomaly in that it appears, stylistically to be of a similar date to the S. and N.E. towers, but a number of construction details differ. The putlogs run through the walls rather than being of a shallow type as seen elsewhere. Each floor was constructed on offsets rather than with joist sockets of corbels and there are some huge pieces of stone used in the quoins, far larger than anywhere else in the castle. The S.W. tower also had a heated guardroom adjacent to the postern gate. The curtain wall which leads up to the keep from the S.W. tower has a stepped wall walk providing secondary access to the keep.

At the time of writing, Wigmore Castle is due to reopen to the public in the Autumn of 1999, and visitors will then be able to freely and safely wander around the impressive ruins of this great castle.

BOTANY, 1998

PETER THOMSON

Potentilla neumanniana Rchb. Spring Cinquefoil (M.L.) Nash Quarry. A rarity of basic soils and limestone grasslands. In Herefordshire it occurs mainly on the Silurian limestones. Elsewhere it shows a predilection for Carboniferous Limestone.

Potentilla anglica Laichard. Trailing Tormentil (M.L.) Gatley Long Coppice and High Vinalls. Recording this plant is fraught with hazards as it appears to have originated as a fertile hybrid between *P. erecta* (Tormentil) and *P. reptans* (Creeping Cinquefoil). *P. anglica* itself hybridises with *P. erecta* and *P. reptans*. The latter hybrid, *P.x mixta*, is widespread, difficult to distinguish from *P. anglica* and much commoner.

Galega officinalis L. Goat's Rue (B.G.) An introduced plant which has naturalized in some areas. It is not mentioned by P. & L.

Astragalus glycyphyllos L. Wild Liquorice (M.L.) Bringewood Chase. Reported as rare by P. & L. and it remains so.

Geranium columbinum L. Long-stalked Crane's-bill (M.L.) Burrington and Wigmore Rolls.

Apium inundatum (L.) Reichenb. fil. Lesser Marshwort (B.G.) A plant of shallow still water and muddy pond edges. Now uncommon in the county with fewer than ten records.

Gentianella amarella (L.) Autumn Gentian (M.L.) Nash Wood and Quarry. This plant of short limestone turf is rare in the county but seems to flourish in disused quarries.

Callitriche obtusangula Le Gall. Blunt-fruited Water-starwort (M.L.) Bringewood Chase. This plant of clear, fresh water has many records in P. & L. but no post-1930 records for the county in the *Atlas of the British Flora*, Perring, F. H. and Walters, S. M. (1962). It has, however, been recorded several times since the publication of the Atlas.

Scrophularia umbrosa Dumont. Green Figwort (M.L.) Bryans Ground, Presteigne. This is a nationally scarce plant but it is relatively frequent in N. Herefordshire, especially in the Teme Valley.

Kickxia elatine (L.) Dumort. Sharp-leaved Fluellen (M.L.) Stansbatch and Elton.

Campanula patula (L.) Spreading Bellflower (J.D.) Sutton Walls. One plant on the N. facing ramparts of the walls.

Silybum marianum (L.) Gaertner, Milk Thistle (F.B.) Wharton. An introduced casual which occasionally turns up but rarely seems to persist.

Hieracium cinderella (Ley) Ley. A Hawkweed (W.A.T.)

Filago vulgaris Lam. Common Cudweed (J.D.) Sutton Walls. Noted as very common in P. & L. but we have only three modern records.

Potamogeton obtusifolius Mert. & Koch (M.L.) Stansbatch. Although a widespread pondweed it has a patchy distribution with very few records in Herefordshire.

Juncus tenuis Willd. Slender Rush (M.L.) High Vinalls. An introduced species from N. America first recorded in 1795. It was first noted in Herefordshire in 1884 and seems as rare today as it was then. It particularly favours sandy tracks on heaths and in woods.

Festuca altissima All. Wood Fescue (B.G.) Great Doward. Only the third record for the county.

Epipactis palustris (L.) Crantz. Marsh Helleborine (M.H.) Queens Wood, Dymock. Coppicing has benefited this plant and this year there were an increased number of flowering spikes.

BRYOPHYTES - Mosses and Liverworts

Leucobryum glaucum, Seligeria recurvata, Wigmore Rolls.

Diplophyllum obtusifolium, Lophozia excisa, Cephaloziella divaricata. High Vinalls/Mary Knoll Valley.

Rhodobryum roseum (found by Ralph Martin), Riccardia multifida, Brimfield Common.

Zygodon viridissimus var. striatus, Gymnostomum viridulum, Encalypta streptocarpa, Rhynchostegium murale, Rhynchostegiella tenella. Mocktree Quarry, Leintwardine.

Lophozia excisa, L. ventricosa, Encalypta vulgaris, Bryum caespiticium. Church Hill, Leintwardine.

Seligeria recurvata, Saccogyna viticulosa, Dicranum montanum, Mere Hill Wood, Aymestrey.

Barbula trifaria, Riccia glauca, Bryum violaceum, Acaulon muticum. Bringewood Chase.

Cephalozia lunulifolia, Calypogeia integristipula, Nowellia curvifolia, Gymnostomum viridulum. Nash Wood and Quarry.

Diplophyllum obtusifolium. Sned Wood,

Barbula rigidula. Cole's Hill.

Zygodon baumgartneri, Metzgeria temperata, Dicranum montanum, Rhynchostegium murale, Frullania tamarisci. Fishpool Valley.

Microlejeunea ulicina, Ephemerum serratum. Berrington Ride.

Bryum subelegans, Orthotrichum anomalum. Bircher Common.

Bryum sauteri, Rhynchostegium murale, Zygodon baumgartneri, Metzgeria fruticulosa. Dinmore Hill.

INTERESTING RECORDS IN 1998 OF HEREFORDSHIRE FUNGI

The number of records of interesting fungi seems to have increased this year. This is partly due to a greater number of mycologically oriented people contributing records, some being newcomers to the county. Additionally, several forays were arranged to promote the Herefordshire Fungus Survey, with good indications, and additional records were obtained thereby. Isolated reports make up the rest.

A rare bracket *Ganoderma pfeifferi* was found growing on beech in the grounds of the English Nature H.Q. at Eastnor. It is characterised by a resinous layer which coats the surface and which can be melted with a match. The same recorder also found the rare and beautiful amethyst-coloured club fungus *Clavaria zollingeri* in Fishpool Valley, Croft, the latter being on the fungus Red Data List.

BOTANY, 1998

PETER THOMSON

During the summer, a rust *Puccinia vincae* which commonly attacks Lesser Periwinkle was found by Orleton Village Hall parasitised by another fungus, *Tuberculina sbrozzii*, and the spectacular Silky Volvaria *Volvariella bombycina* was reported growing on an old elm stump near Bircher Common.

Todophanus carneus, a very small pink cup fungus, occurred on rabbit pellets found on the recreation ground in Orleton. The generic name was bestowed after the discovery that the hymenium takes up the stain of Melzer's Iodine used in mycological microscopy.

The diminutive *Marasmius hudsonii* which grows only on dead holly leaves and is seldom collected, the last previous record being from Lyonshall in 1960, was discovered at Titley Pools, Kington, a HNT reserve, on 3 September. Although only about 2 mm. diam. it has quite spectacular spiky red hairs on the cap, like a microscopic sea-urchin. Interestingly the holly leaves on which it was found having been kept moist, continued to produce more of this fungus for a further three months.

At first acquaintance Bodenham Lakes does not appear to be a fruitful site for fungi, but Walnut Leaf Blotch, *Gnomonia leptostyla* was seen on fallen fruits of an overhanging walnut tree, and a fallen willow yielded the uncommon Lacquered Bracket *Ganoderma resinicaeum*, confirmed by Dr. Pegler, RBG, Kew. The same bracket incidentally was also present on one of the old oaks in the avenue approaching Croft Castle.

A foray to Humber Marsh in August produced a small yellow cup fungus *Cheily-menia vitellina*, where also Prunus Leaf Spot *Blumeriella jaapii* was noted on ornamental cherry (in what is known as the *Phloeosporella* state which has long curved thick conidia) and which causes browning of cherry leaves and early leaf fall. At Lyonshall a different leaf disease *Mycosphaerella ulmi* but this time on hedgerow elm (*Ulmus glabra*) was noted in the same month attacking and browning the leaves.

The rare Sponge Cap *Uloporus lividus* was recorded in Mary Knoll Valley in September; this is always associated with alder trees. There are only two other records of this in the county, the first in 1994 at The Flits reserve and the second at Mallins Wood in 1996.

During a foray in September at Lea and Pagets Woods (HNT reserve) the seldom recorded *Cheimonophyllum candidissimum* was found on the underside of a very rotten log. This is a tiny shining white Agaric with vein-like gills and due to its small size and habit of growing on the underside of rotten logs is probably overlooked. At the same site several Ascomycetes were recorded, amongst which the small cup-fungus *Rutstroemia echinophilla* on last season's blackened sweet-chestnut husks, and the somewhat larger cup-fungus *Peziza ampelina* were interesting finds, as also the unusual *Neobulgaria pura var. foliacea*.

A collection of what is thought to be a new rust attacking wild daisies (*Bellis perennis*) which is now spreading to wild daisies throughout England and Wales, was found at Little Marcle in July, which has been named *Puccinia distincta*. It seems likely that this rust has 'transferred' from the cultivated Pompom daisy.

Wigmore Rolls was the venue of a foray in late October where the very uncommon Sponge Cap Suillus tridentinus was recorded, nearly always associated with larch. According to Fungi of Switzerland it is about 200 times less common than the 'common' Larch Bolete, Suillus grevillei. Other finds included the reddening Fibre Cap Inocybe pudica, and the Brown Jelly Brain Tremella foliacea which is considered rare. The two different Bird's Nest fungi, Crucible Bird's Nest, Crucibulum laeve, and Grooved Splashcup Cyathus striatus were, as always, a point of interest.

Further records from Fishpool Valley included the reddish-brown Cobweb Cap Cortinarius bulliardii in September, considered rare. During a foray there in November a strange little fungus was found, which having been referred to experts was named Corvne albida (Berk.) Korf. A century ago it was thought to be a Basidiomycete called Tremella tubercularia and there are Woolhope Club records of that name in the 1880s at Brockhampton, Dinmore and Whitcliffe. More recently, after a chequered history of bring shunted about in the classification it was finally determined to be the anamorphic state of an Ascomycete Ascocoryne solitaria, of considerably rarity. The November foray also noted Puccinia buxi which is very seldom recorded; it seems to occur only on old long established bushes of which there are several in the valley always exhibiting the rust; the only other known Herefordshire occurrence is a record at Moccas Park in 1951. Some finds even if not rare are of interest, especially if county records of them are scanty, such as the colourful *Pholiota aurivella* on logs by the castle ha-ha, which although not regarded as rare, has in fact only two other Herefordshire records, one pre-1908 at Credenhill listed in the Victoria History (1908), the other at Eastnor in 1967. Nor are there many county records of Hare's Ears Otidea onotica, another find there. Although Birch Bracket Piptoporus betulinus is a commonplace fungus wherever birches occur as in Fishpools, it was rewarding to see an Ascomycete fungus Hypocrea pulvinata which grows on the pore surface of old decaying brackets; this is less often found and has been recorded in the county only since 1988.

Perhaps the star find of the year was a rare Hydnoid, *Creolophus (Hericium) cirrhatus*, recorded on beech from the Woodside area of the Doward. In confirming its identity Kew commented that apart from S.E. England its occurrence is rare in Britain and they had no previous record of it for Herefordshire, and none for Shropshire, Wales or Scotland.

E. Blackwell

The back part of the house is in the position often occupied in western England and the Marches from Cornwall to Cheshire and Flint by a continuous lean-to containing service rooms and sometimes with bedrooms in the slope of the roof above. This could well have been the case here originally with the raising to the present height at a later date.

The roof construction is puzzling. The end elevation mentioned above has no tiebeam or collar-beam as such at present, but the transverse timber in the roof space could well be a shortened tie-beam which would mean that the pitch and height of the roof have been changed. The remaining purlins are from a typical Marcher through purlin roof with the purlins set in trenches in the principals. Again this has been much altered, but is nevertheless a local style in its origin.

The window shapes and sizes are all modern; in the original house they would have been probably of four or five lights on the ground floor and three, perhaps some only two, above.

The long transverse beam in the dining-room has a chamfer of about 3 ins., the sort of depth that was usual in the early 17th century (1600-30) and occasionally found a little earlier. The longitudinal beam in the main room has a narrower chamfer and looks very much as though it may be a later replacement. If so it was no easy job, but I would have expected a wider chamfer and some stops on the ends.

Most houses in this area have a cellar usually under the parlour end of the house, but on damp ground there is frequently a cellar on the ground floor as in the Old Post Office in Wigmore. This is what I would have expected here, but there is no trace of it today. It may well have been that one of the rooms at the back of the house was used for this purpose.

The main fireplace has a lintel about 6 ft. long with a narrow chamfer. On the righthand side is the bake-oven, the usual feature in this area which in many cases was still in use until the last thirty or so years; they went out of use with the coming of electricity. On the opposite side is a second opening, probably for the drying of grain or malt. These secondary openings have different functions in different areas and in the houses of different classes.

The fireplace in the second room is very similar, but it is unusual to find a bake-oven and another kiln in the same house, and this implies a dual occupation back into the 19th century, though I feel it was built as one house originally.

The position of the stairway in the corner of the main room is a fairly common one, but the present staircase is modern. It may be a replacement for an earlier one in the same position or it may have been steeper starting just inside the door and running along the wall, but the window position makes this unlikely.

Thus here we have a house of hall/kitchen and parlour with three rooms above with service rooms along the rear with an upper storey which has probably been raised to give full-height rooms upstairs. It probably dates from c. 1600, but it has been added to and to some extent rebuilt probably on more than one occasion. This has probably been necessitated because of its position on the floor of the glacial Wigmore basin.

Buildings, 1998

By J. W. TONKIN

This year the Old Buildings Recording Group having had talks on the buildings of ten of the Herefordshire Hundreds visited buildings in various parts of the county.

A week-end school with the writer as tutor was based on Leominster.

In the notes below information in the R.C.H.M. Inventory has not been repeated though in some cases the two need to be read together.

ADFORTON

GREEN LANE COTTAGE, SO 414711 Tithe No. 1795/6

This house alongside the Roman road (western branch of Watling Street from Wroxeter (*Uriconium*) to Kenchester (*Magnis*) is not included in the N.W. volume (vol. III) of the Inventory of the Royal Commission on Historical Monuments. This listed and described all buildings and archaeological sites earlier than 1715 and vol. III was published in 1934. I think there is sufficient evidence in the house to show that it should have been included.

The best evidence for this is the heavy timber-framing shown in the E. gable wall in the plans and drawings prepared for Mr. Whitehorn in 1973 and in the adjoining wall of the lounge. These timbers are about 8 ins. wide and are pegged at each joint, the more important ones with four pegs and the less with two pegs. There was no evidence of carpenters' assembly marks but they could be on the other face; one prop mark at least survives in the lateral piece of walling showing that it was reared as one frame. From the size of the timbers, the general method of construction and panel size the date of building was probably between 1570 and 1640. This framing is carried on a plinth with a heavy cill beam, the usual Marches type of building. The truss of this height implies two full stories plus attics in the original house.

From the evidence of the timber-framing remaining and the position of the fireplaces it is probable that this was built as a two-room plan house with three rooms above, a good standard of accommodation for that time, the type of house in which a reasonably welloff husbandman or artisan would have been living. The problem is that there seems to be no evidence of farm buildings which would normally be fairly obvious. Thus the position of the house is a bit puzzling.

The other unusual feature is the fireplace in the dining-room which is almost a duplicate of that in the lounge. Normally the fireplace in this room would be smaller and would not have a bake-oven and a kiln as this one has. The fireplace in the main room has a bake-oven on the left side as one faces it and one the other side appears to have had a kiln or secondary space probably for drying barley for malt.

On the first floor there are three rooms over the three below with similar beams plus two more in the chamber over the kitchen. In the W. wall are three three-light windows over those in the rooms below. In the S. wall there is a three-light window about a third of the way along from the E. There is a quite big stack between this room and the central bay. The eastern beam runs into the stack, but the western is against it on that side. At some time there has been a partition under this beam, but it was almost certainly not an original feature.

The middle bay has been divided to make a modern bathroom in the eastern half of it and the western part makes a landing where the stairs go down to the ground floor and up to the attics. A window in the E. wall has two lights lighting the stairs and the third helps to light the northern room on this floor which has a fireplace partly over that on the floor below. The modern bathroom is approached by a doorway from the landing and from the southern room by one against the W. wall over that on the ground floor.

The northern room again has the two beams in line with those in the other room and is lit by one light of the window lighting the stairs and a three-light window on the W. wall. There is a fireplace against the N. wall over the one in the parlour below.

The attics are approached by the stairs against the E. wall from the landing below. There are three rooms over the three on the first floor; these are unheated today and probably always have been.

The southern room has a three-light window over that in the room below. It is entered by a doorway on the W. side of the big stack which comes up from between the kitchen and hall. This stack is wholly in this room.

The northern room is divided from the middle section by a partition from above that on the floor below. There is a doorway to the E. of the centre, its western jamb being the central post in this partition. Although this is above the timber-framed partition below the carpenters' assembly marks are only about 2 ins. long. The truss is of the typical Marches construction, quite heavy timber with a tie-beam and collar-beam and two through, trenched purlins on each side. Above the collar are two queen struts, one to each purlin just below the apex. Against the N. wall a stack comes up over the fireplace in the room below.

An interesting and rather puzzling feature is a room on the N. side of the house in the central bay against the S. side of the partition mentioned above. It is not pegged yet has carpenters' assembly marks as though it should be. These are chiselled, quite heavy and about 2 ins. long. They are on the southern side and are rather puzzling in that there are marks for the studs 1 and 11 at the top and bottom respectively of the western stud, 111 at the top of the eastern one and IV, V, VI and VII clockwise from the top western corner around the framing. This is an unusual way of placing the numbers and normally a sign of later work, as it appears to be here. This roof seems to be completely devoid of natural lighting and its purpose is a mystery.

Thus this house, at first sight 18th century, has features from the early 17th century. The two southern, single-storey bays could date from that period or perhaps back into the 16th century; usually this quality of stonework is fairly early. The blocked doorway would

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J. W. TONKIN

BREDWARDINE

PENTRE HOUSE. SO 331432 Tithe No. 429

This house is in a magnificent position overlooking the river Wye. It is not mentioned in the R.C.H.M., but this is probably because from outside it looks more like a mid-to-late-18th-century house rather than a 17th-century building that the internal evidence shows it to be. Their terminal date in those days was 1715.

The walls are of local red sandstone and there is evidence in these to show that the first two bays from the S. on the ground floor were built of blocks of this stone as random rubble whereas above it and for the whole of the N. bay they are of thin slabs of the same stone. This latter is the more usual way of building in the W. and S.W. of the county where building in red sandstone is quite usual. The walls are only about 2 ft. wide, an unusual width for stone walls which are normally about 2 ft. 3 ins. as a minimum.

There are three-light windows on both ground and first floors on the western wall, but the central one on the ground floor appears to have been originally a doorway and is now partially blocked. There is evidence in this wall of elliptical-headed windows on both floors. These were smaller than those in use today and the fact that they have gone out of use seems to indicate a major alteration of the house.

On the ground floor in the eastern wall there is a three-light window in the southern bay and a doorway in the northern while on the first floor there is a window with two lights on the present stairs and one light in the southern bay.

In the S. wall there is a doorway at the eastern end on the ground floor and a threelight window on the first floor with another above it at attic level. The N. wall is blank.

Internally on the ground floor the southern room is the modern kitchen and quite possibly always has been.

The middle room has two lateral beams both with quite narrow chamfers only about 1 in, wide with diagonal stops. It is entered from the kitchen by a doorway at each end of the dividing wall with a fireplace between the two beams. Against the E. wall is the stairway with a cupboard in the wall by the foot. It may originally have been a window, but if so there seems little evidence of it today. This room was almost certainly the hall, the main living room of the original house.

A doorway against the W. wall leads through to the northernmost of the groundfloor rooms. It is very similar to the central room, the beams having similar chamfers and stops and there is a fireplace projecting into the room from the N. exterior wall. It is the lounge today and would probably have been called the parlour in the original house. The wall between it and the 'hall' is a typical 16/early-17th-century timber partition, but the timbers at 9 ins. wide are heavier than normal. The carpenters' assembly marks are about 3 ins. long, scratched Roman numerals running from 1 to 111 on the beam and differenced by a V to show the different levels. There has been some alteration at the E. end behind the stairway and the post seems to have been replaced, a difficult and rather hazardous job. These marks are typical of the early 17th century, 1600-30, but the weight of timber looks earlier.

J.W. TONKIN

probably have been the main entrance to this earlier house. The timber-framing on the ground floor could well date from this same time; if so it implies that the third, northern, bay was there as well, but from the stonework this does not seem likely. It may be that there was some sort of lean-to at this end which protected the timber from the weather. The weight of timber is definitely early, usually c. 1500, but from the assembly marks that does not seem to be the case here.

The next stage, probably more or less a continuous building operation appears to be the truss in the roof. It is good sound heavy timber with through purlins and is probably from the period 1620-40, just pre-Civil War. It seems possible that there was a period when considerable work was carried out. Quite possibly the gable entrance in the S. wall dates from this period following the style of the long-house and a feature of S.W. Herefordshire and the neighbouring counties, Brecon, Radnor and Gwent. Alternatively this could well have been the back door of the original two-bay house. The windows in the W. wall are in the position that they would have been then, but have been altered. The blank N. wall is typical; the N. wind was never popular. The kitchen may well have been a back kitchen cum service end fulfilling the duties of the buttery and pantry of an earlier period, but its present use quite probably dates from this period.

In the 'hall' the stops on the chamfers are diagonal and the chamfers themselves are narrow. Normally this would be 18th century, but the diagonal stop was common in the Commonwealth period when all decoration was 'taboo' and here I think they probably date from that period.

Thus we have an early 17th-century house which was added to and modified in the mid-part of the same century, possibly even during the Commonwealth and certainly before the Restoration of 1660. Then there is the puzzle of the late-17th-century room in the attics; what was its use? Quite possibly it was for storing wool, probably in the form of fleeces. Certainly I feel it was a store of some sort and for something not too heavy. There are the elliptical-headed windows of c. 1700; they are quite small and could well be as early as c. 1680. The 'store' in the attics and these windows could have been constructed at the same time. The existing windows are quite probably Victorian, say 1840-60 or a little later. Like almost all houses Pentre has grown and changed to meet the needs of the times and of different owners.

BRIDSTOW

HOUSE AT WILTON CASTLE, SO 590244 R.C.H.M. 2 Tithe No. 51

As the R.C.H.M., vol. 1, p. 31, states the ruined part of this house is partly incorporated in the Victorian house and partly a ruinous wing to the E.

It appears to have been built quite late in the 16th century, so it is truly Elizabethan. It incorporated part of the S.W. corner of the 14th-century castle in its western part and 16th-century walling still exists in three of the interior walls of the present house.

The S.E. rounded angle still has a two-light mullioned and transomed window remaining with part of a similar window above. A narrow projecting bay still survives adjoining this to the S.W. again with the remains of a two-light mullioned and transomed window on ground and first floors, with a string-course carried over the window to act as a drip-mould.

The N.E. wing has an eight-light bay window which used to rise through both storeys, with moulded jambs, mullions, lintel and transom. The W. wall of this wing seems to have been rebuilt in the 17th century and has a more recent chimney-stack projecting from it.

On the remaining short part of the W. wall two two-light transomed windows can be seen on the first floor, but mullions and transoms are missing.

There is a moulded string-course at first-floor level.

The drawing room of the present house has a Gothic revival type window, a vaulted ceiling and a 17th-century overmantel.

Thus the castle was followed by a 16th-century house which was altered in the 17th century and again probably in the early 19th before the present house was built, which itself incorporates some of the 14th-century work. A real architectural jumble, but fascinating.

HOLMER

OAKLANDS, SHELWICK. SO 524431 R.C.H.M. 9 Tithe No. 615

In the Royal Commission Inventory, vol. II, (1932), the house is listed under the general comment 'are of the 17th century and are of two storeys, timber-framed and with tile or slate-covered roof.' Under the entry for the house it says 'Oaklands, house and barn. The House has been entirely remodelled and refaced. The Barn, S.W. of the house, is of three bays, weather-boarded.'

The house has been refaced and the windows are modern, but have probably replaced two-light windows which would almost certainly have been the type in the original with chamfered wooden mullions.

From the porch, which is probably 19th century in date, one enters the main room or hall which has a longitudinal central beam with $2\frac{1}{2}$ in. chamfers and ogee stops, typical of the period from c. 1620-40, the time of James I or Charles I. This room is four panels wide and five panels long with back and front doors opposite each other forming a screens-passage. The five-panel wall has a doorway into it at the inner end and the central panels have been removed to form another doorway. This room is three panels wide and five panels long, again with a central beam with $2\frac{1}{2}$ in. chamfers and ogee stops at the end.

The bigger room, which in the 17th century would have been called the hall, has a 4 ft. deep fireplace in the northern part of the western wall with a space at the southern end between it and the front wall. The smaller room is unheated which was frequently the case at the time; when heat was needed a brazier was used.

The rooms at the back were probably used for storage and as a scullery or back kitchen the eastern room having a wall in it. This was quite often the case in medieval times and here even in the 17th century it was still happening. In the middle of this block are the stairs to the upper floor where there are two bedrooms over the rooms below.

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At the eastern gable end, close to the well is a doorway and a door at the other end leads to stairs leading up to a granary at the western end behind the chimney. There is a passage at this end in the same position as that found in the long-house in the S.W. of the county.

Probably there were dormer windows at the front and back originally for the roof has been raised both at the front and the back. The central roof truss shows this well. It has a tie-beam with a collar-beam above and the doorway is cut through the tie-beam and pegged into the collar. The roof has two trenched through purlins on each side and a ridge purlin typical of roofs in the Marches and on the western side of England in general as well as Wales. The 8 in. timbers are typical of a slightly earlier date than that given by the R.C.H.M. and this is confirmed by the one carpenters' assembly mark still surviving which is some 5 or 6 in., a length normally found in the mid-16th century, from c. 1520-75.

Thus we have a good example of a typical Elizabethan house 'disguised' externally by modern rendering.

HUMBER

PRIDDLETON COURT (Upper Priddleton). SO 548572 Tithe No. 61

At first sight this house looks Georgian, probably mid-18th century, and this is no doubt the reason it does not appear in the R.C.H.M. Inventory of 1934.

However, when one gets into the roof and examines the carpenters' assembly marks it seems that it dates from c. 1700 and as the Royal Commission on Historical Monuments terminal date for inclusion was 1715 this house should have been included.

Houses of a similar type are at King Street, Ewyas Harold, and Black's shop in Widemarsh Street in Hereford.

The front with its regular pattern of windows and its central doorway is typical of the late 17th century through much of the 18th giving a symmetrical or near-symmetrical appearance. The back also is quite symmetrical. The roof today appears to be of one build and one wide span, but the interior shows otherwise. The stone used is red sandstone, the basic underlying rock of much of Herefordshire and the reason for the colour of much of its soil. There is a plinth slightly wider than the 26 ins. (660 mm.) of the walls. This thickness applies to the central wall as well as the exterior.

The front doorway with its fanlight is typical of good Georgian work and is probably of the mid-to-late 18th century. The door surround is again of red sandstone, but has been hammer-dressed giving the fine lines on its surface.

An interesting feature is the two pear trees close to the W. gable. It is not uncommon to find trees planted close to a house, probably too close for the good of the foundations.

The house is of the typical nearly square plan of the late 17th century and most of the 18th and early 19th, in this case about 47 ft. (14.3 m.) by 40 ft. (12.2 m.). There are four square rooms on each floor. The centrally-placed front door leads into a wide passage-way with a doorway either side into each of the rooms at the front and to a

stairway on the W. side with thirteen stairs, nine straight up and four on the curve to the landing at the top. Behind these two rooms are two more each with a doorway to the one in front. The easterly of these has the back stairs built against it and this space has been taken off the square and they lead down to a back hall inside the back door which is slightly off centre to the E. Opposite it and behind the front stairs is a larder opening off the corridor. The chimneys in the two front rooms are both within the walls, so that there are chimney breasts projecting into the room but that of the N.E. is outbuilt. All four rooms are lit by a window in the lateral wall, but the back rooms have an extra one in the gable walls that in the N.E. room immediately adjoining the outbuilt stack.

On the second floor the two back rooms each has a window on the gable wall and the S. W. room has incorporated the room over the entry thus giving it two windows on the S. wall and forming a lobby at the top of the stairs. The lower stairs have turned balusters whereas those to the attics are square implying that they were socially less important.

There is a cellar under the parlour which is usual and ensures that on the ground floor that room at least had a wooden floor. There was a bake-oven in the kitchen and another opening opposite it, perhaps for drying malt or perhaps a sauce oven.

The roof over the back part of the house has four queen-post trusses with a diagonal strut either side of the queen posts and the joints are numbered from I - VIII in short punched carpenters' assembly marks typical of the late 17th and early 18th centuries c. 1680 to c. 1720. Over the front part the roof is of the king-post type, a form of building which reached this area from the N.W. very late in the 17th century and became common in the 18th century in houses and farm buildings. Again there are four trusses this time with slightly longer carpenters' assembly marks from I - V. Both roofs are hipped at the gables. An interesting feature and typical in the better quality roofs of the period is the horizontal strut across the corners of the roof.

The windows have fine glazing bars probably of the Regency period, c. 1820-40, but possibly a little earlier, say anytime from c. 1790, and are examples of one of the best periods of English carpentry.

The barn has a six-bay roof of the same king-post type as the front of the house and probably dates from the same period.

Thus here we have a house of c. 1700 built probably in one building operation, but perhaps over a few years. If that is the case the back came first, but more probably the difference in roof structure is due to the very latest style being used at the front.

KENCHESTER

BRIDGE HOUSE. SO 437432 R.C.H.M. 4 Tithe No. 12

The R.C.H.M. Survey 'Herefordshire', vol. II, East, published in 1932 suggests that the house is early 18th century in date and states that it has exposed timber-framing and some internal beams.

This seems to me to date the house much too late, and seems to apply to some reconstruction which probably was carried out at that time.

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The regular square panels still in quite heavy timber are very unlikely to be as late as that and much more probably date to the earlier 17th century or even later 16th, any time between c. 1570 and c. 1630. The panels on the front of the house are slightly vertical rather than square, but still of the same heavy timber. They were pegged with two pegs at each joint in front; so that there were four pegs where a timber had two others meeting at right angles. On the sides and at the back there was one peg to each joint, a little cheaper to do than that at the front. Almost all the panels are now infilled with 20th-century brick, but a few have wattle and daub still remaining.

The front, S. wall was originally jettied with a bressumer decorated with a roll and a quirk and a narrow chamfer, but this is now underbuilt and almost completely hidden. The carpenters' assembly marks are scratched Roman numerals about $3\frac{1}{2}$ ins. long which probably dates them to the first generation of the 17th century, the 16th-century examples in this area being longer than these.

The doorway is at the W. end of the S. wall and opens directly into the hall a relatively unusual feature, for there is normally a passage across the house. The other significant feature which can be noted from the outside is the central stack with its chimneys. This is normally a later 17th-century feature in this area and one would expect a lobby entrance, with a doorway in the centre of the house opening on to the central stack. There is no evidence of any of the original windows, though their position and proportions are about right, for the 17th or late 16th century.

In the hall the reason for the doorway being well off-centre is soon clear, for facing the fireplace is the evidence of a high seat, the master's seat at table. The evidence is to be seen at the top of the four central timber-framed posts in the S. wall and at about a foot from the ground in the second and fifth posts in the wall. There is an inserted block where the supports for a seat would have been housed. At the top blocks have been inserted where some sort of canopy would have come out from the wall over the high seat, an idea still carrying on from the open halls, e.g. Rufford in Lancs. A similar feature is to be seen in The Dog at Bosbury.

There are two transverse beams across the hall cut from timbers over 10 ins. square and with a deep 7 in. chamfer. This depth of chamfer is normally a mid-16th to third quarter of the 16th-century feature, as in the White House at Aston Munslow in the Corvedale in Shropshire.

The central stack is about 8 ft. 4 ins. E. to W., and contains a fireplace in the hall and in the parlour and another in the chamber over the parlour. The fireplace in the hall has stone jambs and a wooden lintel with a roll moulding carried right round. This is found in the late 15th century and early 16th and reappears for a short period in the very late 17th, 1680-1700, but usually with a deep ovolo moulding rather than the roll. It seems as though there was a bake-oven on the E. side and an iron sway still survives.

The parlour to the N. of the central stack has two transverse beams similar to those in the hall. On the beam above the second post from the W. are some carpenters' assembly marks about $3\frac{1}{2}$ ins. long, usually a length found in this area in the early 17th century. The fireplace has stone jambs and a timber lintel, but in this case the moulding is a cavetto or

hollow chamfer between two little quirks, but the fascinating part of it is the three rolls forming deep hollows at the base of the jambs cut out of the stone and then continued as a scribed zig-zag pattern cut into the stone with a fine chisel. This is a very unusual form of decoration and is probably early 16th century in date, certainly the moulding is of that period and the three rolls would go with it and the zig-zag seem to be a contemporary extension of those.

It seems as though the original stairway was of the newel type against the screen between the parlour and the modern dining room, perhaps originally a little parlour, but more probably a service room. In the parlour wall is preserved a panel of good quality wattle with oak stave verticals and split oak staves woven around them forming a base for plaster.

In the chamber over the parlour is a fireplace with 1 ft. 7 ins. high stops and a 3 ins. chamfer on the stone jambs and timber lintel. A stop this height is normally very early, almost certainly not later than the early 16th century and could well be late 15th. In combination with the 3 ins. chamfer a date in the 16th century is the more likely.

The chamfer on the beams in the small bedroom is $4\frac{1}{2}$ ins. normally a mid-to-later 16th-century feature.

The roof has two trenched through purlins of quite heavy timber with a collar at the upper purlin level and an angle strut to the tie-beam from about midway between the purlins. Both the collar and the struts are single pegged and there is a long scribed carpenters' assembly mark running across the joint between principal and collar. This is probably a sign of early-16th work.

Thus the evidence of the jetty and the fireplace mouldings points to a date in the late medieval period or just after, say 1480-1520. The deep chamfers on the beams could be of this period, though normally beams would have been moulded in a similar fashion to the jetty and fireplaces, but more elaborately.

The core of the house seems to be c. 1500 in date and this could also apply to the heavy timber framing though I would have expected bigger panels. This house had a lot of money spent on it late in the 16th century, perhaps 1570-90 and again in the early 17th.

The hall fireplace was clearly used for cooking, but there may have been some ancillary buildings including a kitchen and brew house close by.

Whoever had this house built was wealthy, possibly a well-off yeoman, not necessarily a farmer in the modern sense, but perhaps some official, though it seems too far from the city for that. Maybe it was the home of the bailiff for the surrounding estates who was also doing some farming. Perhaps we shall come across some documentary evidence some time as to who.

PETERSTOW

COTTAGE AT PETERSTOW. SO 562244 ? R.C.H.M. 5 Tithe No. 232

This house may perhaps be the one mentioned by the Royal Commission on Historical Monuments in Herefordshire vol. 1 - South-west (1931) under Peterstow. The entry

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reads '(5) Cottage, S. of High Town Farm and 500 yards S.S.W. of the church, has some exposed timber framing.' This comes under a general entry of the 17th century.

However, having looked at the four beams in the main room which is about 15 ft. by 14 ft. I would put it rather earlier, for each beam has 4 in. slightly hollow chamfers (some would call it a cavetto moulding) with stepped run-off stops at the end. These probably date from the mid-16th century probably from the period 1535-1560. Inside the gable some framing is exposed and this looks as though it belongs to the 16th century or even early 17th. It could be from any date from c. 1530 - c, 1630. Unfortunately it was not possible to see any carpenters' assembly marks or the purlins in the roof which would have helped to narrow down the dating to within a generation or so.

The rooms on the S. are an addition probably dating from the later 19th century and quite possibly replacing an earlier lean-to service and dairy extension. There is a bread-oven to one side of the chimney and a smaller opening on the other side, possibly for drying barley for malt.

Just inside the doorway is a cupboard under the stairs, these ascend from inside the room against the W. wall. They are probably 19th century in date, but may well have replaced an earlier stairway.

There appears to be some evidence of timber-framing in the S. wall between the older room and the 19th century rooms to the S.W.

In the corner of the garden is a rectangle of stone walling, possibly the site of the privy.

Thus there seems to have been a mid-16th century timber-framed house probably of one room down and one or two up and a lean-to service extension along the back, probably the house of a reasonably well-off tradesman or husbandman.

PRESTON WYNNE

COURT FARM. SO 556469 R.C.H.M. 2 Tithe No. 94

This house is one of nine examples in Herefordshire of a rare type of medieval house found mainly in this area and in the Weald, viz. houses with base-crucks as their main truss in the hall. There are a few examples in the west country, but altogether only about ninety in England and Wales including about twenty-five non-domestic examples. There are none in Scotland or Ireland as far as I can trace.

The Royal Commission on Historical Monuments in Herefordshire vol. II East (1932) describes the house as having a hall with a wing to the S. and an extension to the N. In this account the main truss is described as being of 'crutch type,' which today would be called 'cruck.' Base-crucks were not distinguished from normal crucks in those days. In Herefordshire there are some 180 cruck buildings, but only nine base-cruck buildings. Eight of these were listed in my paper 'Social Standing and Base Crucks in Herefordshire' in *Vernacular Architecture* I (1970). I listed nine in that paper, but of these The Hyde in Stoke Bliss is actually in Worcestershire, though in Hereford Diocese. Since then one more has been discovered, Upper House, Preston on Wye, so the total remains nine.

The house is timber-framed with a slate roof on the cross-wing and tiles on the earlier hall block, but it seems quite possible, in fact probable, that these replaced stone tiles. The middle part of the hall block started as an open hall in the 14th century, the S. wing was the solar wing and was largely rebuilt early in the 17th century and at the N. end of the hall in line with it is a 17th-century service extension. The R.C.H.M. states that this was later 17th century, but there seems to be no definite evidence for this, and it presumably replaced an early service end or wing. In the hall block the timber-framing is hidden on the E. side by a comparatively modern lean-to and has been plastered on the W. side. Elsewhere, i.e. in the S. wing on the W. gable and in the N. extension of the hall it is still exposed though partially covered with weather boarding on the E. side N. of the lean-to. The panels in the timber-framing on the wing and side of the hall extension are not quite square, just vertical rather than square and in this area this is usually a sign of early 17th century or late-16th-century work rather than later in the 17th century.

However, the panelling in the N. gable is square and like that in the side and the wing gable is set on a plinth and in this part is three panels high whereas in the wing it is five panels high. In the wing W. gable there is a collar beam and in the N. gable of the hall block extension there is a collar and upper collar.

The chimney breast in the corner between the wing and the hall on the E. side is of local stone with three diagonally-set shafts with diagonal nibs, again a feature which could be very late 16th-century of early 17th, more probably the latter.

The original open hall was divided into two storeys probably in the 16th century. The main truss is of base-cruck type, as has already been mentioned, S. of it is the spere truss forming a ceremonial entry into the great hall and to the N. beyond the old hall the later part. Above the base-cruck truss is a quatrefoil in the centre and a trefoil either side all cusped and chamfered. There is a trenched purlin on either side and at the ridge and a further purlin on the base-cruck itself on each side. These are set purlin fashion not as is on some base-cruck houses, square in the way that arcade plates are set. Above the spere truss again there is a central quatrefoil with a trefoil each side, all three cusped and chamfered. More interesting is the fact that the spere truss has a hollow chamfer with pyramid stops which is good evidence for a 14th-century date.

Beyond the spere truss on the S. (wing) side of what must have been a screens passage is a tie-beam on posts with a short, curved brace at each end. This passage would have had a doorway at each end and anybody entering would have gone through a doorway between the external wall and the spere post into the hall or S. into the crosswing. In the passage roof are wind-braces with cusping and sunk spandrels in the cusping, again a sign of an early date.

The hall is about 27 ft. 6 ins. by 20 ft. (8.41 m. by 6.11 m.) and the evidence for its 14th-century construction shows that the occupant must have been of quite a high social standing. The inserted beams in the hall and in the cross-wing have a 4-5 in. chamfer with ogee stops which indicates a fairly early date, probably second half of the 16th century, for the division of the hall. This would match the dating of the timber-framing in the wing and the N. end. Some of the beams had the more usual 'Wern Hir' stop, i.e. run off stop with a little step.

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The cross-wing of two storeys plus attics and cellar presumably replaced an earlier wing S. of the screens-passage. This block is completely rendered now except for the one gable already mentioned. The carpenters' assembly marks are about 6 ins. long with an extra stroke to denote different levels. The length of these marks together with the wide chamfer on the beams points to a date in the later 16th century rather than the early 17th century for the rebuilding of this wing. The roof has two through purlins on each side and a ridge purlin all trenched into the principals and this could have been built at any time in the 16th century and most of the 17th, but it is the carpenters' assembly marks, the chimneys and the chamfer of the beams which help put the date into the later 16th century rather than the 17th. The only suggestion of a slightly later date is in the plain stops on the beams, usually a sign of later work, but the chamfer width and size of beams and carpenters' assembly marks indicate the earlier date.

The other base-cruck houses in the county are of manorial status except possibly Peg's Farm at Wellington Heath and the house in Bell Square at Weobley. The fact that this is 'Court' Farm presumably implies that this also was of manorial status.

Almost always a house with a base-cruck truss has one only, the central truss, but as far as I can trace six of the ninety have more than one. Certainly these were among the wealthy houses of their period, mainly 14th century.

WIGMORE

BROOK FARM. SO 413689 R.C.H.M. 16 Tithe No. 180

The R.C.H.M. dates the house to the 17th century with more recent additions to the S., but from some of the evidence in it I think it dates from the later 16th century.

The present doorway faces N. and is approached up three steps from Brook Lane, this slight raising above lane level being very useful when the brook floods.

The early house is on a two-room plan with a central stack. Each room has a N.-S. main beam centrally placed each with two beams running into it at right angles. In the hall these have a 4 in. chamfer slightly hollowed which in this county usually dates from the mid-16th century, third quarter rather than second, truly Elizabethan. Today an inserted screen helps keep out the draught from the doorway.

The big fireplace has a lintel with a 3 in. chamfer with the Wern Hir type stop, i.e. a slight step and then run off. There is in this fireplace a bake-oven next to the front (N.) wall.

To the E. of the big central stack is a similar room, but here the beams have 3 in. chamfers. On some of the wall timbers the marks made by the craftsmen's adze can still be seen. It seems odd that the chamfers in this room should be narrower than those in the hall. This usually denotes a slightly lower social status.

The roof is of three bays with V struts and one through, trenched purlin on each side. The carpenter's assembly marks are long, scratched into the timbers and use a circle over one of the figures to denote a different level.

To the W. of the house are a barn and outbuildings. These are not mentioned by the R.C.H.M.; presumably they felt these had been constructed after 1715, the terminal date for their survey. I think they are correct in this assumption, but they are nevertheless a good set of typically Marches outbuildings.

DYMOCK, GLOUCESTERSHIRE

GREENWAYS HOUSE. SO 696334

According to the Rev. J. E. Gethyn-Jones the Hankins lived here in the 13th and 15th centuries. David Verey in the Penguin Buildings of England series, *Gloucestershire: The Vale and the Forest of Dean* suggests that the central portion of the house with its diagonally-set chimney is 16th century.

If anything remains of the original house it is the one bay of the roof with curved wind-braces, but I doubt it, for if these were of that date they would almost certainly have had some cusping on them and hollow chamfering on the lower side. These look more like 16th-century wind-braces.

As one approaches the house set on the hill facing S.E. the lower hall block and the diagonally-set chimney with the three-storcy addition on the right stand out clearly. These are in brick laid in Flemish Bond which first reached this country in the 1630s and is unlikely to date from before the Civil War of 1639 and much more likely to be after the Restoration in 1660. Behind this front part is a wing and beyond to the N.E. a barn and a cider-house both using the same brick bonding as the main building. A straight joint on the S.W. wide of the S.W. wing indicates that the wing was extended, but probably fairly soon after it was built. The chimney block here must have been outbuilt at the end of the original wing.

Evidence that the site is older than the existing house appears behind it to the N.W. in the remains of a moat which presumably surrounded the 14th-century house of the Hankins family. The same feature appears on a number of medieval sites of which Lower Brockhampton in Herefordshire is a well-known example.

The hall roof has a through ridge purlin with one through side purlin on each side, trenched into the principals. Some of the rafters are laid flat which is a sign of early work and would fit well with a 16th-century date. All the replaced rafters are on edge in the later 17th and 18th-century fashion.

The carpenters' assembly marks are about 5 ins. long in Roman numerals with an added line to denote a different level, all deeply scratched. This length of mark is 16th century and I would place it in the period 1550-80, which was at the beginning of the period of good farming from early Elizabethan times to c. 1640. There is another set of carpenters' assembly marks, some of them on the same timbers as those described. They consist of a circle linked with part of a circle making an incomplete figure of 8. These are definitely done with a brace and bit for the circle centres are clear, and this type of mark is usually late 17th century. It seems possible that these were cut on the timbers when work was carried out in that period perhaps at the same time as the king-post truss was inserted.

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The three-storey wing to the E. of the original block has a Venetian window on the ground floor and on the first floor and a lunette in the third storey. This is certainly an 18th-century addition, but it may well have replaced an earlier wing. There is a date 1776 on this wing and this is quite probably the date of this alteration.

The house appears to have been widened at some stage, probably in the later 17th century just after the Restoration, and a low, king-post truss had been used to give this extra width. Perhaps the Hankins family who were responsible for the fireback in the room adjoining the hall dated 1661 carried out a major restoration of the house over a generation or so, c. 1660 - c. 1690.

In the hall the entrance doorway is central which is almost certainly not its original position, it is more likely to have been at the eastern end of the front wall of the room. However, Cotehele in north Cornwall has a central main doorway, so such a position would not be unique. The fireplace in this room is on the S. wall; its lintel is 9 ft. long and 14½ ins. deep with an ovolo mould at the bottom. There are a number of taper marks on it and probably this form of lighting was the main one in the 16th century or more probably early 17th century, for it is unlikely that the ovolo mould here is much before 1600 and more probably just after. There is evidence of there having been a canopy over this lintel, a feature found in a number of late-medieval, 16th and early-17th-century houses. It helped pull a little more draught to help the smoke go up the chimney rather than into the room. In the wall opposite the fireplace, i.e. the N. wall is a doorway with a lintel extended slightly both sides forming a broad-shafted T, usually a late-17th-century feature.

The room to the S. of the hall with the 1661 fireback was presumably the parlour, the master's private room. There is a doorway into it from the hall to the E. of the main fireplace stack.

A doorway on the W. wall of this parlour leads into the stairwell with nine joists exposed and containing the front stairway which has a good hand-rail and finely turned balusters. At the top of the stairs is a Chinese Gothic gate, usually a sign of the 18th century as in the fence at Broadward Hall just S. of Leominster.

Beyond the stairwell is the kitchen with thirteen joists exposed in the ceiling. It is in the S. external wall of this room that the straight joint shows outside presumably marking an extension of the wing. The back stairs against the W. wall have a gate at the top. These gates are sometimes referred to as dog gates. Presumably they helped keep dogs from the bedrooms, but equally kept children from falling down the stairs.

In the three-storey N, wing is a double cellar with brick vaulting. There is a hole 8 ins. by 6 ins. running under the house. What was its purpose? The cellar stairs ascend to the first floor around a newel in the corner. They are of brick, but the treads are of stone and judging by the amount of wear are re-used, presumably for an earlier cellar which was under the earlier wing before the rebuild in the 18th century. There are the usual drains in the cellar.

Between the main bedroom in this block and a little room in the roof of the hall block is an internal window. Was this for communication between master and servant - a sort of early serving hatch for morning tea? The barn, now a swimming pool, has an upper base-cruck roof, a type often found in granaries and hop-kilns in the 19th century. The brick of the barn and the 'cider-house' appears to be of this date and the top step of the 'cider-house' is half of the base of a cidermill. Although now cased in later brick the carpenters' assembly marks in the cider-house are scratched, typical of the early 17th century.

The whole complex appears to have been a major farm-house and associated buildings probably dating back to medieval times and rebuilt and refurbished more than once on more of less the same spot. It would have been the home of a well-off yeoman and if not a manor-house in the strict sense, it was of similar status, or manorial equivalent.

LLANGUA, MONMOUTHSHIRE

MONMOUTH CAP FARM. SO 392261

This house does not feature in Fox & Raglan, Monmouthshire Houses, (1950-4), nor in P. Smith, Houses of the Welsh Countryside (1975).

It is of stone and today has a modern clay tiled roof, but used to have the typical stone roof of the better houses of the area. The house faces E., with a chimney at each gable, the southern projecting about 2 ft. 7 ins. beyond the gable giving it a total depth of nearly 6 ft. It is 42 ft. 4 ins. long and 20 ft. 4 ins. wide. There is a string-course at first-floor level along the front of the house and a big single slab of stone carried in front on two posts forms a porch roof. All the stone is the local Old Red Sandstone laid in quite thin blocks very similar to the style of the Black Mountains.

Internally there are three bays totalling about 37 ft. 2 ins. by 16 ft. 4 ins. in width, the side walls being about 26 ins. thick and the gable an inch or so more. The middle bay is used as a hall and today also has the stairway going up from the W. side with doorways against the E. wall into the southern room, dining, and northern room, the lounge. Each bay has a transverse beam in the centre with simple, moulded stops probably of the second half of the 16th century. The western and central beams are about 9 ins. wide, the one in the lounge about 10 ins. The fireplace in the dining room 5 ft. 6 ins. long and 2 ft. 8 ins. deep has a bake-oven and an iron sway, while that in the lounge projects 3 ft. 6 ins. into the room and is 6 ft. 5 ins. wide overall.

The front and back doors are central; so the central bay is in effect a wide cross passage, similar to those in the local long-house. The windows in the front wall, one in the lounge and one in the dining room, both have shutters, the former being of the single mullion, single transom, **†** type, of the late 17th/early 18th century.

The total size of the southern chimney is 9 ft. 5 ins. by 4 ft. 10 ins. and the northern 6 ft. 5 ins. by 4 ft. 9 ins. The wattle is of the superior split oak stave type and some of it is very heavy.

The southern frame and truss have scratched carpenters' assembly marks on the N., hall side. On the ground floor they are about 6 ins. long Roman numerals from I = IIII while on the first floor three joists on the W. side of the roof have the mark Y on the E. side /Y. There are also on the first floor some more deeply cut about 2 ins. long. The

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panels on the ground floor are 37 or 38 ins. square, but upstairs are about 40 ins. vertically and 30-31 ins. across. It is a typical Marches collar and tie-beam truss with V struts above the collar. The insertion of the doorway in the centre of the truss on the first floor has meant cutting through the tie-beam and inserting a door-head below the collar. The jambs of this doorway are about 10 ins. wide. There are two trenched through purlins on each side and a ridge purlin. The tie-beam is rather over 13 ins. deep and the collar just over 11 ins., while the muntins are $8\frac{1}{2}$ to $9\frac{1}{2}$ ins. wide on the ground floor, typical of the almost extravagant use of timber in this well forested area. The additional mortices above the collar and a number of unused peg-holes probably indicate that much of the timber has been re-used.

The northern frame and truss are very similar to the southern. Again there is an inserted door-head in the centre and the carpenters' assembly marks are / on the joists on the W. wide and // on those on the E. side. There is an additional mortice on each side above the V struts, which indicates a yoke at the top just below the ridge. The struts and the principals forming this top 'diamond' all have holes in them for wattle. This is a bit puzzling as the space either side does not seem to have any. One very interesting feature and again something which could be puzzling is the fact that there are two peg-holes in the lower part at the W. end of the tie-beam, now over a stone wall, but indicating that this was once on a timber-framed building. Was it this one?

The purlins seem to be largely re-used timber some probably from this site, others from elsewhere; some of them were not originally purlins. The lower on the E. side of the house over the northern bay is smoke blackened almost certainly from a roof above an open hearth. The one above it has a 4 in. chamfer with a heavy triangular stop typical of the mid-17th century. That in the central bay on the W. side seems to be a re-used horizontal mid-wall timber which has a diamond-mullioned four-light window in it and regular wide timbers with wattle in quite wide panels above, this would appear to be re-used from a 16th-century house, probably of the earlier part of the century or even the end of the 15th. That at the lower level of the southern bay on the eastern side is a re-used purlin now upside down with peg-holes for common rafters, a wealthy form of building in the later 16th and earlier 17th centuries. The lower purlin on the W. side in the southern bay seems to be from the top of a post and panel screen.

There is quite a bit of evidence for dating this house to the 16th century with some alterations late in the later 17th. The wall thickness of the lateral walls is typical of stone areas, but the gable walls are unusually narrow; normally they tend to be a little wider than the sides. The chimney and fireplace sizes are normal in fact the main one in the S. wall is a bit smaller than many.

The carpenters' assembly marks are typical of the second half of the 16th century. This would agree with the slightly vertical shape of the remaining panel evidence in the southern truss; it was not until the very end of the century that panels became really regular and square. The string-course could be from anytime in the later 16th century or early 17th. Later than that it would have been more of a band. The heavy wattle is a sign of wealth rather than dating evidence, except that I don't think you would have found the really heavy example after the mid-17th century.

The doorways upstairs appear to have been inserted, access must have been by what were virtually ladders. These doorways were probably inserted quite early in the house's history, perhaps soon after it was built.

The roof seems to have been rebuilt, but exactly when? There is a lot of re-used timber, some of it no doubt from a previous house on the site, some of it quite late. The N. window in the E. wall is typical of the period 1680-1700 and the shorter, heavier carpenters' assembly marks on the northern truss could date from this period. The timbers in both trusses have mysterious mortices just above the collar. The trusses are probably not re-used; so presumably there was a change of plan when they were being constructed. It seems probable that the roof was reconstructed and a lot of work done on the house sometime in that period. Was the northern truss originally intended for a timber-framed house which was not built? The string-course on the front shows some sign of wealth and importance, but that the house should face E. is a little unusual.

The final conclusion must be that this is a later 16th-century house which was very much restored in the late 17th or very early 18th. Socially it was probably the home of a well-off farmer.

THE SLEATH (LLECH), Llangua, Grosmont Fawr. SO 392256

This house and its farm building is not mentioned in Fox & Raglan, *Monmouthshire* Houses, (1950-4) nor in P. Smith, *Houses of the Welsh Countryside*, (1975).

The house, now cased in brick, is of four bays of cruck construction about 47 ft. by 18 ft. internally and appears to have consisted of a two-bay open hall with a central hearth, a two-storey parlour bay to the E. and a service bay to the W. down the hill. The plan is almost that of a long-house, especially with the wide passage beyond the central stack, but there is no evidence of there having been a byre at the lower end as at Black Daren in Llanveynoe parish in Herefordshire which is a very similar house.

The hall was divided into two floors probably between about 1605 and 1640, the lateral beams having the classical ovolo mould. This moulding came into this area with the influence of the Renaissance and died out again with the Puritan influence of the Commonwealth period.

The carpenters' assembly marks are about 7 ins. long usually a sign of mid-16thcentury work but certainly appear to be much earlier here. The post and panel screen dividing the hall from the parlour has stops at about the height of a bench, the master's high seat, facing the fire and at the top of this screen are two blocked mortices which could well have supported some sort of a canopy over the seat in the days of the open hearth. There is no evidence visible of a louver, but the timbers are well smoke blackened close to the chimney-stack and it looks as though the fireplace was built on the actual site of the open hearth and so has hidden the louver above where the smoke would have escaped. The post and panel screen is a typical Black Mountains, Breconshire, Monmouthshire feature. The wattle of split oak staves is heavy and of very good quality.

The roof E. of the hall has one transverse beam with a slightly hollow 4 ins. chamfer with a stepped run-off stop which could date from anytime in the 15th century to the third

Mammals, 1998

By BERYL HARDING

The water-vole has disappeared from two-thirds of water-side sites in the country. It is the largest British vole and the only one to use aquatic habitats. Adaptations to the aquatic life can be seen in its thick, dense undercoat of fine hair and longer guard hairs to give waterproofing, its round face and short, round ears for streamlining which also have a flap for closing when under water.

Although often called a water-rat it is not related. Brown rats seen at the water-side have pointed faces, tails with little fur and less rounded bodies. Field and bank voles are related but not aquatic. Water-shrews do not compete for food as they are carnivorous while voles are herbivorous,

The water-vole is a very good swimmer, only using its feet to steer never the tail, however, it cannot stay under water for more than twenty seconds and needs good plant cover nearby when it surfaces.

During winter they spend more time underground using teeth and strong claws to extend their territories with more tunnel systems within the bank. These systems include several shafts and chambers extending more than a metre from the river edge. Some tunnels open below water as escape routes. Parts of reeds and grass tussocks are used to line the chambers.

After a reluctant courtship the female gives birth three to four weeks later producing a litter of hairless and blind young just under two cms. in length. Eating twice her body weight daily she produces a rich milk which allows them to grow rapidly and be weaned after fifteen days. The female may have up to five litters each summer containing five young.

The water-vole has a staple diet of grass plus over a hundred other plant species including ground elder and mare's tail. They 'do good' by eating many of the weeds that thrive in water and have to feast during autumn to lay down sufficient fat reserves to pass the winter in a torpid state. Some food will be stored in the chambers.

They are shy and secretive to avoid predators and require thick vegetation at the bankside. When out of the tunnel system they regularly use the same pathways but never more than two m. from the water edge so these require cover. In dry weather when the water-level drops their tunnel entrances can be exposed making the voles vulnerable to stoats, weasels and mink - a recent newcomer to the English scene. The increased numbers of mink have become their main predator as they are able to infiltrate the tunnels. If the voles are forced into the water they then stir up the mud as a camouflage while escaping but if forced onto land they are vulnerable to birds of prey.

From their life-style it can be seen that slow-moving rivers with thick bank vegetation is of prime importance. However, their population has dropped by 70% over the last few years in Britain and Herefordshire has a low count. This cannot be attributed to the

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quarter of the 16th. However, from the size of the crucks I think it must be 15th century and I would have thought fairly early in that century. This was almost certainly the parlour, the master's private room. The chamber above it would have been his bedroom; the doorway in this room is very much like that in a similar position at Black Daren.

The fireplace with its plain 4 in. chamfered stone jambs and matching timber lintel is probably an insertion of the early 17th century and contemporary with the ovolo-moulded beams. The depth of the chimney-stack about 3 ft. 6 ins. is not sufficient for two fireplaces and makes it almost certain that the broad passageway behind it is the original cross-passage of the house. It is wide enough to have taken cattle, but as mentioned above there is no evidence for this. Perhaps it was simply fashion in a long-house area.

The room beyond this wide passage has two transverse beams with a chamfer of about 2¼ ins. each side. There is a narrow timber close to the screen dividing the room from the passage, but I am not sure of its function. This room was clearly a service room with the bake-oven by the fireplace which also has a sway in it for carrying pots over the fire. Next to the fireplace on the S. side is a more recent copper for washing, probably from the later 19th century, and beyond that between it and the outside wall are the remains of a kiln probably for drying barley for malt.

There are three pairs of crucks, one with the post and panel screen set in it, one at the front of the fireplace and stack and the third at the screen beyond the cross-passage. They are heavy crucks about 26 ins. at the elbow with 12 in. trenches for the trenched through purlins.

Across the yard is a four-bay cruck barn with quite big crucks slightly angled and a clear space for a threshing bay. This barn runs down the hill and at its lower end is what may have been a stable or an ox stall at a lower level.

The siting is interesting with one lane leading N. to Great House, the site of the Benedictine house and the other leading W. to Llangua Church.

Here then is a farm set up of the first third of the 15th century, modified and improved in the period of good farming and the great rebuild in the late 16th/early 17th century, modernised again in the late 19th/early 20th when the house was cased in brick, probably in the period of high farming c. 1870 or before the days of the steam ship and overseas farm produce.

During the year nineteen planning applications concerning listed buildings were received. All were for comparatively minor alterations or additions and none warranted objection or serious comment.

As in the past my thanks are due to a number of people, especially those who have drawn my attention to buildings and those who have invited me and allowed me to wander around and look at their houses and outbuildings.

BERYL HARDING

increase in mink alone but mostly to drainage and over-clearance of bankside plant cover. If a two-m. strip could be left alongside their preferred rivers without cutting or ploughing then the populations could stand a chance of recovery.

Ornithology, 1998

By BERYL HARDING

The year opened with gales of up to nearly 100 m.p.h. in most parts of the country and with storm-lashed winds in Herefordshire plus flooding but January then continued comparatively mild with the change towards warmer winters that have been occurring over the last few years. Mallard, Feral Pigeons, Collared Doves and Blackbirds were starting to breed.

Herefordshire Ornithological Club (H.O.C.) records show large numbers of waterfowl making use of Wellington Gravel Pits and ponds (W.G.P.). Flocks of *c*. 15-90 Wigeon, 75-90 Pochard, 2,000 Black Headed Gulls with 400 Lesser Black Backed Gulls and a maximum of 300 Tufted Duck and 120 Lapwing were seen in January with slightly fewer numbers in February. Bodenham Lakes has been the best bird-watching site in the county but the W.G.P. is rapidly becoming more so and further gravel extraction will give more pools and wetlands in the future.

An exceptionally warm and dry February with southerly airflows gave temperatures of 11°C plus. By 14 February temperatures were 16-20°C over the county - the warmest February day since records began in 1759. Daffodils were out by the middle of the month with magnolias by early March and vegetation generally was advanced by four weeks. Comma and Painted Lady butterflies were seen as well as Brimstone and Small Tortoise-shell. Pipistrelles and long-eared bats were foraging over ponds while hedgehogs and badgers were coming out of hibernation early. All of this led to very early nesting attempts by Great Crested Grebes, Mallards, Tawny Owls, Dippers and thrushes. Some Rooks were active about their nests by mid-February.

March was unsettled at first but southerly winds returned and brought the mildest March since 1961. Many thrushes, doves, Robins and Dunnocks had fledged healthy first brooks. By 2 March some Sand Martins had returned to W.G.P. and male Wheatears, our earliest spring migrants, were seen over moorland. On 3 March a pair of Tawny Owls were seen in an owl nesting-box with three well-grown young and by 5 March Blackcaps were in song. These are over-wintering here more frequently but are not necessarily 'our' summer migrants but visitors from W. Germany - unheard of a few years ago. The Cuckoo was heard calling by 31 March at Bredwardine a good three weeks before time and a few 'trail-blazing' warblers had arrived.

With such consistently warm weather for so many weeks at the end of March broods of Grey Heron, Raven, Crossbills and Mistle Thrushes were seen on the wing.

With the poor spring and summer of 1997 many seeds and fruits were less plentiful, apart from a good crop of beech mast, so it was a good winter for Bramblings - one flock of 500 was noted at Bircher Common. When winter is mild more song birds survive and compete for the same foods including mast. The beech mast can lose its nutritional value and turn to compost sooner when it is mild so causing Bramblings and others to visit gardens where food is put out, or to take garden berries, hips and seeds.

ORNITHOLOGY, 1998

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All of this was obviously too good to last and from 1 April winds from the N.E. brought torrential rains with snow in the higher parts of the county. The heavy frosts scorched the early plant growth and open-nesting birds were hard hit over the coldest Easter for a decade. Even broods in nest-boxes were saturated and abandoned. Deluges and flash floods occurred over Easter when three times the normal rain for the month fell giving the biggest floods for a hundred years and the wettest April this century.

The cold also dramatically affected the invertebrate populations so reducing food resources for birds. Fledglings from the early broods had to rely on supplementary feeding in gardens, if they could get it, thus showing how valuable it is for people to continue feeding birds into late spring to early summer. Parents of nestlings also benefit as they have to spend so much time brooding their young to give them warmth. The Swallows and House Martins that had arrived early had to delay nest-building and spent much time over lakes and reservoirs hawking for the fewer emerging insects.

By the end of April there was a let-up in the rain and temperatures rose steadily, apart from May Day. The southerly winds allowed the hitherto delayed migrants to return and other nesting birds to redress their losses. Temperatures rose by mid-month to over 25°C allowing plant growth to recover and invertebrate populations to increase and the pleasant dry spells helped some birds to recover such as diurnal raptors, corvids and thrushes.

However, second clutches were hampered by a cool, wet end to the month and then the wettest June since 1860 for many parts of the country and the coolest for a century. Spotted Flycatchers, for example, were by then four weeks behind with nesting progress and some clutches not fully incubated by 26 June.

July was another cool and cloudy month with few warm days while August was dry and sometimes hot so drying out the soil-food supplies for birds.

By late August and the first week of September a series of vigorous depressions, including the tail-end of a hurricane, brought an abrupt conclusion to nesting operations by many late-breeding birds, so ending the season with below average results for many.

August is a quiet time for most birds - earlier migrants such as Swifts and Cuckoos will be leaving for Africa. Others are in moult and keeping a low profile. Insectivorous warblers switch to a diet of sugar-rich fruits to build up reserves for migration also visiting gardens for the supply there. They double their weight before leaving which is then lost en route.

The H.N.T. next-box scheme for 1997 showed recording took place at 27 sites with 150 more boxes recorded than in 1996. Eleven species made use of the boxes.

	1997	1996	1995
Sites recorded	27	23	27
Boxes recorded	939	787	851
Boxes used	531	535	478
Percentage used	57	67.7	56.1

In spite of the poor weather at Holywell Dingle reserve the earliest egg-laying took place since recording began there seventeen years ago. Weasel predation was again a problem at Mary Knoll and Mansell Lacy.

Of all the once fairly common countryside birds the Tree Sparrow seems to have declined most. As few as 10% remain compared with twenty-five years ago but some can still be seen in gardens. Both the male and female have the same plumage with a distinctive white collar and a black mark on each cheek. Being birds of farmland and scrub they feed on the smaller weed seeds of stubble fields, an increasingly lost habitat due to autumn planting, and they, like other farmland birds, are also vulnerable to increased use of herbicides. They will readily use next boxes and will take smaller seeds put out for them especially black sunflower. Perhaps it could become a garden bird conservation success story in the future?

Woodland birds are also in trouble. The British Trust for Ornithology (B.T.O.) is running a survey based on the reasons for the loss of the Nightingale (never a common bird in Herefordshire) to try to ascertain causes and reasons for this general decline. The Common Bird Census also run by the B.T.O. has shown the following declines nationally in woodland numbers over the last twenty five years.

Dunnock	down	50%
Song Thrush	н	45%
Goldcrest	н	61%
Willow Tit	11	46%
March Tit	"	32%
Spotted Flycatcher	11	83%
Starling	14	71%
Bullfinch	и	56%

Many of these surveys occur in nature reserves and S.S.S.I. sites where it would be expected that results are better than average. The situation in the wider countryside therefore could be worse.

September was warm and dry with no rainfall and October was also mild but very wet producing extensive floods - recorded as the wettest for twenty-eight years. November proved average with no extremes. December was comparatively mild so that a few thrushes were singing staking their claim to prospective territories. Great Tits were also beginning to sing. The year closed wet and mild with many of the berries still untouched until needed later.

CITY OF HEREFORD CONSERVATION AREA ADVISORY COMMITTEE REPORT 325

City of Hereford Conservation Area Advisory Committee Report of the Club's Representative, 1998-9

By JEAN O'DONNELL

The new Herefordshire Council began work in April and the consequent disruption caused by the relocation of offices affected C.A.A.C. by limiting the assistance for recording minutes and planning decisions. It has been difficult to know the outcome of our advice but we are hopeful of improvement.

The demolition of the stable buildings at Litley Court took place and its conversion into flats with eight houses in the grounds has been carried out. There was some concern that the front entrance gate and wall were not in keeping with the house.

An application by the Post Office for a new sorting office in Station yard looked promising as it proposed a new wall with railings and landscaping with trees. In the event yellow brick has been used on a massive building which does not blend well in an area of red brick structures like the station. It remains unfinished to date.

In St. Owen Street, Wargrave House applied to construct a conservatory at the rear which would have concealed three bays out of six on the ground floor of Dr. Cam's orangery and spoiled the Victorian architecture. The committee advised against this application.

1a Widemarsh Street (Briggs Shoes) was to be refurbished. This fine 18th-century building with original panelling was to have had two major staircases removed to the loss of the plan. The main door is in Bewell Street. Permission for this was refused.

A matter of great concern is the area around Scudamore School behind the Victoria Eye Hospital. The site is also occupied by Watkin's Imperial flour mills, Victoria House, which is in Arts and Crafts style, and the Midland Red bus station. The plan for the County Hospital to be built with private funding means that the N.H.S. buildings will be sold. Application was made by C.A.A.C. to have the Eye Hospital and Victoria House listed together with Lord Scudamore School and the significant parts of the flour mill which was once the Hereford Iron Foundry and which is now derelict. English Heritage refused to list the N.H.S. property but are considering the other buildings. A proposal for a retail development by a consortium was greeted with horror as it would mean wholesale clearance of the site and the erection of ten shed-type units. Scudamore School was built in 1852 and has some fine detail inside. The construction materials were of high quality and it has survived remarkably well especially when compared to post-war school buildings. There has been great resistance to this proposal from the school and from the military club who also occupy the site. It was considered that the area around the school would be suitable for low-cost housing within the City rather than retail development which would mean that the hospital buildings could be incorporated into a scheme. Since the committee of C.A.A.C. visited the site the mill has been damaged by fire.

Eign Enterprises continued to make its mark upon the City with an application to demolish the Greyfriars restaurant buildings and build twenty-nine flats on the site. This is another sensitive site bordering on the river and close to the road bridge. The design was not considered suitable for the situation. Problems with flooding meant that the living accommodation had to be raised upon stilts. The design is to be modified before it is accepted. It was thought that some private gardens should be included into the scheme.

Other riverside developments by the company include the restaurant by the medieval bridge which is nearing completion, an area by the river behind St. Martin's Street now occupied by an unsightly green shed, and a larger area which has been allotments. A scheme to enhance the riverside with walks and gardens would be welcomed and would soften the hard lines of the modern buildings planned.

The same company has been refurbishing the Castle Pool Hotel which was in need of renovation. It has been upgraded and remodelled and should enhance Castle Street where it occupies a dominant position close to the main entrance of the former castle.

New magistrates' courts are needed in Hereford but the plans for building them on the corner of Bath Street on the car park next to the former steam corn mill (1848) were disappointing. The plans required the removal of the mill workers' houses which, like the mill, are not listed and the design would not have enhanced the neighbouring buildings or the conservation area. It was felt by the committee that the new courts should convey a feeling of civic pride and an alternative plan was requested.

Kemble House, close to the library in Broad Street, has had concrete panels removed and a new sham façade is being inserted. It was thought that the blue panels were unsuitable for the conservation area and that the opportunity to enhance one of the buildings so detrimental to Broad Street should have been taken. One can only hope that the result will be better than expected.

The Conservation Area award for the best restoration was given to All Saints' Church. The rebuilding of the spire, insertion of a new W. window, and replacement of much of the eroded stonework has given this building a new lease of life. It was threatened with closure but the work of Rev. Andrew Mottram and the parish in partnership with English Heritage has ensured that many more people visit and enjoy its treasures. The inclusion of a restaurant has been done in a modern style which does not alter the fabric of the building and allows visitors to sit and contemplate the stained glass by Margaret Aldrich Rope.

Natural History Section, 1998

By BERYL HARDING

23 March. The Annual General Meeting was held at the Friends' Meeting House in Hereford, followed by refreshments and a talk with slides by Peter Thomson on 'The Landscape and Plants of S. W. Australia.'

30 April. A visit was made to some of the Doward nature reserves to see how woodlands can be managed for conservation. This was led by John Voysey.

The Doward forms the N.W. corner of the Forest of Dean plateau with Carboniferous Limestone overlying the Old Red Sandstone layers and dipping S.E. below the later coal deposits of the Forest basin itself. All woodland in the 17th century, it was subsequently managed as coppice for charcoal for the iron smelting there. Commoners' rights led to encroachment in the N. with a maze of little lanes and tiny fields. Subsequently these holdings merged owned by fewer tenants and separated by low limestone walls topped by coppiced beech hedges - now grown into large trees. The reserves visited contain the remnants of these walls and subsequent woodland.

Twenty-one hectares had been part of a Woodland Improvement Grant Scheme with coppicing for butterfly conservation so half the woodland was thinned with some felling around King Arthur's Cave. Deer-fencing was required around 5 hectares/12¹/₂ acres for the control of deer which would otherwise damage or kill the young coppice shoots. Work in the Leeping Stock reserve was the most extensive. Overall, access was difficult with 1,200 tons of wood extracted by 60 lorry loads so £2,000 needed to be spent improving access with timber returns of £4,000.

On a sunny spring day the group started at the reserve below the White Rocks. The extra light gained from the wood cutting had increased the numbers of bluebells flowering. In one woodland maiden oaks had been left for future timber and income in 100 years' time. Ash, field maple and hornbeam are gradually re-entering. The old trunks have been left for woodpeckers. As this had been an agricultural area no bluebells occur. A balance is required to give light to the herb and shrub layers and to allow the remaining trees to grow thicker. A beech under-storey is useful as it prevents clusters of tiny twigs, or epicormic growth, on the trunk of the timber trees so spoiling their value.

Sycamore seedlings and under-storey are useful providing food for squirrels and distracting them from other forestry damage where they can do great damage to the crowns of the oak trees. In the clearer patches where the soil is base-rich yellow archangel, ransoms and Colchicum grow. Bracken is not likely to be a problem as the soil is not acid enough.

At the Miner's Rest reserve coppicing has been done where the woods are thin - the cherry trees grow by suckering. This is also a Butterfly Challenge area with deer-fencing for coppice protection. 100 tons of wood for pulping had been removed from trees sixty years of age. In future the coppicing will be on ten-year cycles for the next thirty years. All

tree coppicing promotes vigorous growth as there remains the old and large root-system able to stimulate bud growth and expansion. The young cherry trees grow fast - a m. by one year of age. These showed the distinguishing marks of hare damage. Much brush had been left in piles and as brushwood boundary fences which will be of value to invertebrates. Where there had been bonfire sites a rich moss flora had arisen.

At Woodside, a S.S.S.I., the woodland had been well coppiced in the past with the demand for smelting and tanning. The coppice has now been thinned out again to give larger trees for the future with some coppice under-storey. Beech brushwood has been left which rots quickly. The oldest part of the reserve has the best future potential for oak woods and will be managed on ten-year coppice cycles for the next forty years. Of note is the very large service tree which has suckered extensively. The adjacent meadow flora includes cowslip, salad burnet, columbine, many species of orchid and the tine adder's tongue fern.

Moving on to Lower Wood, beech, oak, maple, silver birch, cherry and thorn can be found but all yet need some clearing to give the required open space with a central glade for butterflies.

Leeping Stocks was cleared this spring to provide a good butterfly habitat with bluebells, orchids and rosebay willow herb which provides good feeding for bees and butterflies. It was rare before the war but sprang up on burnt patches after bombing. It is still a mystery plant and may well compete with bracken. However, management will be 100% coppicing in seven-year cycles which could lead to the shading out of both the willow herb and any bracken.

Plants were early this year with the mild February but after the cold of April were now two weeks behind.

The White Rocks reserve was the last quarry worked then Monmouth District Council used it as a tip capping it with acidic subsoil. All the trees planted then died as the pit was still oozing and acidic. Now many silver birch are colonising the top and edges. Where the original limestone periphery occurs rock rose and bee orchids grow in abundance. The decision now is to let it re-forest naturally over the pit area.

15 May. An evening visit was made to Lower Hope Farm, Ullingswick, led by John Llewellyn and with kind permission of the owners Mr. and Mrs. C. Richards. On a bright, summery evening the object of the visit was to see how conservation and farming can successfully go hand-in-hand.

The estate is some 2,000 acres which is on average 300-600 ft. (100-200 m.) above sea-level on silty clay loam of the Bromyard series derived from Old Red Sandstone. The rolling scenery provides a good catchment area giving abundant water from springs and held in various ponds. One such recently made holds 3,000,000 gallons. Having been derived from underground the water quality and purity is high. Parts of the farm-house are *c*. 13th century but the adjacent hop-kilns are no longer in use since the collapse of the British hop market.

Over the years Lower Hope Farm has been managed as a mixed farm with grain, cider, perry and sheep, cattle and pigs fattened on feed produced on the farm. This

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method of livestock rearing still continues - an important point as it is both cheaper and quality can be maintained where other choices could be restricted.

Today potatoes and pigs are the farm's largest crops. The pigs are housed in a highhealth unit on nearby Sidnalls Farm with good quality breeding stock producing up to 6,200 pigs annually. There is loose housing for sows and all are on straw with natural ventilation and computerised feeding. A great improvement on the intensive methods more widely used by some farmers.

Cattle and sheep are raised on grasslands radiating from the home farm at the lower levels on clover-rich sward. Trees have been planted giving a park-like appearance to the paddocks but mainly for shade and shelter to livestock. A balance is carefully kept between the cattle/sheep grazing numbers and the stock density which reduces the need for parasitic worm control. In winter the stock are housed in light, airy, open-sided buildings in family units so avoiding both stress to the animals and damage to the soil. They are fed on farm-produced forage and bed on farm-produced straw. The housing of sheep during lambing time has paid dividends. All animal waste is now partially composted and then returned to the land so the disused slurry tank of 250,000 gallons is now used for water storage for grassland irrigation.

The arable crops today are cereals, oilseeds, beans, peas and potatoes. 100 acres of arable land is being worked in conjunction with Rosemaund Experimental Husbandry Farm with its environmentally friendly practices, to be then used to advise other farmers who wish to use similar methods and reduce the need for agro-chemicals. Crop rotation is on a six-year cycle, especially for potatoes (one of Herefordshire's most important crops today) which gives good skin finish and avoids potato cysts.

The original project of organic farming in the early nineties had to be dropped with the then economic crisis but is continued on two of the outlying farms. Lessons from these are being integrated with the general estate farming practice at present having become more viable with the increase of public awareness. Milk is the most profitable organic product today.

On the steep escarpment to one side of the estate are 200 acres of woodland and undergoing various stages of development. Conifers are gradually being replaced with broad-leaved trees while thinning is going on in the older hardwood plantations. During the last ten years another 42 acres of hardwoods have been planted under the Farm Woodland Scheme and two more ponds have been established. With the increased light availability after thinning brambles can become a problem and need flailing regularly. However, they do provide a good habitat for dormice. There are deer but they pose no problem.

Instead of perry pears and cider apples today there are Bramley and dessert apples with cherry and soft fruits. The orchards are at 550 ft. giving better quality and taste to the fruit. The planted wind-breaks are alder, a variety that does not require streamside planting. Another reservoir of 7,000,000 gallons collected in winter is used to irrigate the orchards which are soil-tested and gauged for water needs. Miniscule chemicals are used with minimal spraying but it is difficult to grow organic fruit in the U.K. because of the

high humidity and the demands of the supermarkets for uniformity in size. The blackberries and raspberries are trickle-irrigated and machine picked. The 9 acres of cherries consist of small trees with polythene strip covering above which prevents dripping from the leaves as well as protection from birds. When under cover the yield is 2 tons/acre with no fruit splitting but when grown organically with no cover there can be up to 50% split fruit.

As well as the main woodland and the farmland tree-planting, hedgerows are encouraged to grow wider and thicker by cutting only every two years. Trees within the hedge are left to grow where possible so the whole provides extensive wildlife corridors joining the patches of woodland field corners. Field headlands are planted with wild flowers providing sanctuary and a reservoir for pest predators. The movements of these predators into the crops are being regularly monitored by A.D.A.S. (Agricultural Development and Advisory Service). Also the crop cultivation methods are being used to evaluate the effect on soil structure and nitrogen rotation within the farm management strategies.

Some 22½ hectares/c. 12.8 acres are used for set-aside and the estate participates in the Countryside Stewardship Scheme concerned with raising standards of farming. With the present lower farming profits the scheme should be viable for many farmers today and should lead towards improving the environment using less intensive methods.

18 June. A visit was made for a day of general interest in Queen's Wood, Dymock, and led by Dr. Michael Harper and Dr. David Boddington.

On a mild day of fitful rain and some heavier showers a party of seven members with the two leaders met to examine parts of the wood which are managed by Dr. Harper and his team of volunteers in such a way as to enhance its natural history interest. These reserve areas have been designated by Forest Enterprise and Dr. Harper and represent a variety of the habitats present. Eventually it is hoped to link them in such a way as to facilitate the migration of fauna and flora from one area to another in the hope that small isolated populations can become more viable with greater opportunities for interbreeding.

The wood itself straddles the Herefordshire/Gloucestershire border with 75% in Herefordshire. The area comprises a low plateau at a height of 250-300 ft. (c. 75-90 m.) into which the headwaters of the Ell Brook, a tributary of the Leadon, are shallowly incised. The soils of the plateau are generally acidic with a pH in the order of 5-5.4 and support common ling, *Calluna vulgaris*, in many places. The bottoms of the valleys have richer calcareous soils flushed by spring water and in one case at least contain deposits of tufa.

Prior to coniferisation, mainly with Douglas fir, *Pseudotsuga menziesii*, and Norway spruce, *Picea abies*, the wood had been almost entirely devoted to coppice so that large old trees are scarce to absent, but with the periodic opening up of ground to the sunlight at the beginning of each seven-ten year coppice cycle, the ground flora was rich and varied and likewise insect/invertebrate life was prolific. The management aims for the reserve areas are to reintroduce a traditional coppice regime and now after some fifteen years there is considerable enhancement of both flora and fauna.

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After a brief introduction to the wood as a whole the party visited one of the valleys which had been managed as a coppice reserve for many years. The abrupt change of vegetation from a ground flora of heather, bracken, *Pteridium aquilinum*, on the better drained, acid slopes to the alkaline soils of the valley floor supporting drooping sedge, *Carex pendula*, wood small-reed, *Calamagrostis epigejos*, and purple moor grass, *Molinia caerulea*, was noted.

In accordance with new directives on stream corridors, the trees are being removed from a zone 15-20 m. wide on either side of the stream. This has the incidental effect of letting in more light and heat which is essential for many of the breeding moths and butterflies. Coppicing of shrubs on the valley floor is undertaken at intervals of three or four years as the young coppice growth does not dry out the ground too much and is beneficial for the breeding of the rate clearwing moths whose caterpillars burrow into the young coppice wood of birch, *Betula pendula*, and alder, Alnus glutinosa. Other shrubs and trees in this area include alder buckthorn, *Frangula alnus*, hazel, *Corylus avellana*, rowan, Sorbus aucuparia, sallow, *Salix caprea*, ash *Fraxinus excelsior*, and blackthorn, *Prunus spinosa*. In parts of the wet ground two flowering plants of particular interest are found the bog pimpernel, *Anagallis tenella*, and the marsh helleborine, *Epipactis palustris*, both of which were recorded from the site in about 1890 and are found in only a few places in Herefordshire today.

Tufa occurs in parts of the valley floor and it seems that the thin covering of Downton Castle Sandstone, which underlies the plateau surface, has been penetrated in the valley to expose the Upper Ludlow Shales below and these, being more calcareous, could be the source of the redeposited lime. In the vicinity of the tufa formation Dr. Bod-dington took a number of pH readings with the following results. During a drought period in 1997 stagnant pools gave a reading of pH 8.9-9.2. This year in wetter conditions with the stream flowing the rainwater registered 5.2-5.3; recently formed rainwater pools on the stone track gave 7.4 whilst water over the tufa and stream water 70m. downstream from the tufa, also pools in the marsh after a heavy burst of rain all registered 8.4. Water in the footholes at various points in the marsh gave readings of 7.3, 7.6, 8.5 and 7.9. (All results were obtained by taking the average of three readings from the same site.)

On the night before our visit Dr. Harper had set a moth trap in the marshy area and its contents were examined. Species found during the visit included a number of micromoths *Ancylis laetana* which feeds on aspen, *Coleophora taeniipennella* which feeds on jointed rush, *Juncus articulatus, Epiblena uddmanniana*, a bramble feeder and *Udea fuscalis* which feeds on cow-wheat, *Melampyrum pretense*. Those in the trap included:-

The Satin Lutestring	-	Tetheela fluctuosa
Mottled Beauty	×	Alcis repandata
Common White Wave	-	Cabera pusaria
Common Wave	-	C. exanthemata
Light emerald		Campaea margaritata
Lobster Moth	-	Stauropus fagi
Coxcomb Prominent	-	Ptilodon capucina
Brown Rustic	_	Rusina ferruginea
The Fan-foot		Herminia tarsipennalis

A second reserve which was visited has only been relieved of its conifer cover for about two years and the conifer brash was cleared during the winter of 1996-7. Most of the remaining broadleaved trees have been coppied. Now, after only two seasons of growth, the new coppice is up to 6-8 ft., more than 2 m. in places, but small quantities of herb Paris, *Paris quadrifolia*, and betony, *Stachys officinalis*, were also present.

The final stop of the day was at a large reserve which runs parallel with the M50 motorway. Coppicing began here some fifteen years ago. The regrowth in the early coppiced areas is very great and in the area as a whole there are now coppiced stands of various ages with consequent variety of wildlife. Daffodils, which survived but probably failed to flower under a dense conifer cover have reappeared and flowered well whilst birds, especially warblers, have greeted the new management with a spate of song and breeding success. Dormice are present but also rabbits which are taking their toll of coppice regrowth. Elsewhere in a managed area harvest mouse nests have also been found.

In managing the reserves there is a problem of disposing of the cut material. The overgrown coppice poles are of limited interest to woodland craftsmen, although a few have been sold to that outlet. The brash of small twigs is of no value and is stowed away in inconspicuous corners where it will eventually rot down and also in drainage ditches where it inhibits rapid drainage. The large poles are cut into lengths of 6-8 ft./c. $2-2\frac{1}{2}$ m. and are stacked in a free-standing wigwam or eco-heap. These have become the proud hallmark of the volunteer working group and they also attract their own wildlife. Mammals and birds appear to use them for shelter and possibly for breeding sites, and some insects revel in them especially if oak poles are stacked on the S. side of the heap.

(Account thanks to Peter Thomson in the Field Secretary's absence.)

23 July. A visit was made to Tregaron Bog to see a rare example of a raised bog. This was led by Hugh Culyer, warden of this National Nature Reserve.

On a clear, bright day the terrain visited was seen to consist of three raised bogs covering some 200 acres/120 hectares. It became a N.N. Reserve in 1955 and was purchased in 1977 so it still has some farming tenancies but sheep grazing is avoided if possible with pony and cattle grazing encouraged.

To the W. side of the bog flows the river Teifi and to the E. at the edge of the wooded hill-sides was the old railway from Aberystwyth. The line closed in the 1960s but the track ballast of limestone gives a good base-rich surface for lime-loving plants in turn providing flowers attractive to butterflies and dragonflies. Overall on the reserve here are eighteen species of dragonflies many of which breed in the pools left by old peat cuttings. At an old kettle-hole lake near the valley edge five herons were seen and also Little Grebe which often breed there.

12,000 years ago a post-glacial lake was formed in the area dammed by a terminal moraine, where the village of Tregaron is now. Sectioning and pollen analysis through the bog shows this as a clay layer with phragmites remains. This stage lasted for c. 1,000 years then gradually moving into a transitional phase of reedbeds with no more phragmites and slowly silting to become a fen with meadow sweet, water dropwort and willow carr. 800 years ago with climatic warming succession led to woodland giving a closed canopy within

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the valley floor. 4-5,000 years ago in the Neolithic and Bronze Ages woodland clearance, combined with cooling climatic conditions, allowed sphagnum moss to accumulate leading to acid bog formation. The species of sphagnum found at the lower levels no longer occur. Thus a record has been obtained of the environmental climatic changes over time.

Today there is little lag-fen remaining peripherally but it is hoped to recreate this habitat enriched by the nutrients from the surrounding hillwash. In the central bog areas the only water received is from rain which is nutrient-deficient giving an acid-loving flora such as the primary plant species of sphagnum, bog asphodel (which gave a wide sweep of yellow-orange colour to the landscape with white tufts of cotton grass and red patches of the insectivorous sundew) amid the bright green sphagnum. All three species of sundew can occur especially *Drosera intermedia*. *D. anglica* can be found but is rare for that part of the country occurring mostly in the north and in Scotland. Bog rosemary was found also throughout the whole bog and also liverworts such as *Odontaschisma denudatum*. *Sphagnacola* species with *Kurzia panciciflora* which is not so common and a moss *Atrichum crispum* which is not found in Herefordshire or Shropshire. There was not much variety in the sphagnum species found and *S. bolticum* has not been seen since 1967 and now only occurs in four sites in Britain.

The bog is dome shaped at its centre rising to 24 m, over the old layers of sphagnum peat. The moss decays at its base with the stems and leaves continuing upward growth absorbing the rainwater through their cellular structure rather than through root hairs. Farming tenants had turbary rights so significant amounts of peat have been removed by hand - never mechanically. Ninety-five per cent of lowland peat mires or bogs have been lost in the country during the last century from peat cutting or drainage.

At Tregaron Bog no further cutting occurs but drainage on adjoining farmland poses a problem. This is being counteracted by the building of banks downslope of the bog edges to maintain water-levels within the site. It will still take another five years to continue the damming of all three mires so there is regular monitoring of both the water-levels and plant species change. In the drier parts purple moor grass, *Molinia caerulea*, could take over - so far no introduction of the preferred plant species has occurred. Management of the reserve must avoid the flooding of neighbouring farmland as their agricultural needs take precedence over those of conservation.

No burning takes place on the reserve but sparks from the railway caused fires in the past. In such areas the bog vegetation was lost and heather has since predominated. In drier patches heather, *Calluna vulgaris*, and crossed-leaved heath, *Erica tetralix* can also grow with random patches of crowberry, cranberry and several Cladonia lichen species. The micro-climate below the mosses is warm and adders are very frequently found amid the tussocks.

Frogs, toads, palmate newts and small mammals are abundant, so too are their predators, foxes, weasels and polecats. Buzzards and short-eared owls also occur in numbers - most of the neighbouring farmers have been provided with barn owl nesting boxes which are being used. Red kites are also to be found and both curlew and plover next there.

The river has been straightened in the past. It was the last beaver hold so the water authorities are considering its re-introduction. Water-voles inhabit the banks but are subject to mink predation. Otters too can be seen but their holts are where the river banks are less exposed and near tree-cover.

Flanking the bog towards the river is a wide sweep of purple moor grass forming very large tussocks 60-120 cms. high, between these shelter can be obtained for many animal species but walking through the grasses proved to be both difficult and tiring and even tiresome.

23 July. An expedition was made to look at the geology and evolution of the landscape at the Stiperstones and in the Shelve area which was led by Peter Thomson. This was very similar in content to a similar trip to the area in 1993 and little further can be added to the notes make then - see *Transactions* 1993.

17 September. An examination was made of the pond at the new H.N.T. reserve at Waterloo, Letton.

This is in a low lying area of glacial clays and other deposits trapped behind one of the terminal moraines of the Wye glacier and forming the present-day ridge of c. 139 m. running S. from Norton Canon towards Staunton-on-Wye and westwards to Bredwardine and now cut through by the present course of the Wye. Within the Letton Lake area the flat land often floods in winter giving alluvial deposits also.

Waterloo reserve, not a S.S.S.I., was part of common land with strip grazing in the past until enclosed at the time of the tithe map, so the hedges being post-tithe are not very rich in species. Depressions in the field are the result of digging for clay for a small brickworks nearby leaving marshy hollows until the summer, one of the largest is a pond.

Two earlier visits in March and July gave sightings of brimstone butterflies and snipe near the hollows in March. Surface sweeps of the pond gave a number of pondskaters, water boatmen (Notonecta species), copepods and abundant mayfly nymphs. Bottom sweeps showed leeches, water louse and caddisfly larvae utilising stick cases. In July there were quite a few small grasshoppers and butterflies such as the meadow brown, the large-white, comma, large skipper, gatekeeper, 6-spot burnet and fritillary moving too fast to identify which species. Also Red Darter damselflies. Sweeps gave volvox (tiny balls of colonial green algae), and samples of pea mussel, water louse, mayfly nymphs, Gerris water beetles, Chironomid larvae, Anopheles mosquito larvae and quite a few newt larvae which had recently hatched.

The main visit in September gave no results for surface or bottom sweeps which belied the amount of life previously seen. The water-level had dropped especially as there had been little rain in July and August. Most aquatic larvae had completed their life-cycles and left the pond while others were in an encysted state awaiting the return of more water. Many small frogs were still moving from the pond and needing careful avoidance on our part. As the reserve had remained ungrazed all summer its hummocky landscape was masked.

The group then moved to another newly-acquired reserve nearby - The Sturts. This is an S.S.S.I., it was not enclosed so the hedges are older and species-rich with an average of 6-7 per 100 m. In the first field faint ridge and furrow marking is still visible.

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The Sturts is an important acquisition as it comprises 16 hectares/40 acres of wet pasture land and meadow at Letton. It has been notified as a S.S.S.I. because it is defined by English Nature as the 'largest area known in Herefordshire of MG4 *Alopecurus pratensis* - *Sanguisorba officinalis* grassland, a Nationally Scarce Habitat of species-rich unimproved wet pasture and meadow' i.e. a rich grassland predominated by meadow fox-tail and great burnet with their associated flora.

Within the Letton Lake low-lying basin is an extensive series of such relic wet grasslands, both improved and semi-improved with a pattern of ditches, streams and ponds and where unimproved is of prime bio-diversity importance which is increasingly rare in the Herefordshire countryside and particularly threatened.

In addition to mature hedges a range of large pollarded trees suggest a rich invertebrate variety as well as a habitat for many farmland bird species. Buzzard, curlew, snipe, moorhen, mallard, heron and reed-bunting are to be found amid the ponds and damp patches.

The group walked the whole reserve. Many of the smaller ponds had also dried up but the largest gave more interesting results than at Waterloo. Hares have been recorded although none were seen that day. A few cattle were summer-grazing the grassland.



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