

Recent Excavations in Christ Church and Nearby

By DAVID STURDY

with sections by N. P. Bayne, H. J. Case and G. H. Weaver

I. CHRIST CHURCH

A NUMBER of small excavations were undertaken from 1954 to 1961 in Christ Church, a college the site of which covers about a tenth of the area of Oxford within the Town Wall and encloses the ancient Church of St. Frideswide, by tradition founded in the 8th century, the nucleus of the city (FIG. 1).

Excavations in a college are exceptionally advantageous since the stratification observed may command very full documentary interpretation.

Termini ante quos can often be deduced, when town houses are found stratified below extensions of college buildings and gardens. Also in their archives, colleges have preserved by vested interest the records of an earlier urban life. These sources which illuminate an early medieval town, as it was before any college or the university itself existed, have been exploited more by pens in the muniment room than by pick-axes in the quadrangle.

The recent excavations in Christ Church have brought to light prehistoric flints and have revealed occupation of the late Saxon period sealed under a 12th century road. They have shown a large ditch or watercourse immediately to the south of the Saxon town, silted up and built over in the 12th century, the Town Wall being later built at its northern edge.

The pits of medieval houses were explored. Many more recent structures, subsequent to the foundation of the College in 1546, were also found, and the stone footing in the Cloisters, a notorious architectural puzzle, was shown to belong among them.

The sites of two parish churches, the synagogue, four roads, a long stretch of the Town Wall and many well-documented domestic and academic sites capable of producing much information also lie within the college

EXCAVATIONS IN THE GARDEN OF THE SOUTH-WEST LODGING (1954-5)

Six cuttings were excavated in the winter of 1954-5 in the garden of the Canon's lodging at the south-west corner of Tom Quad, occupied from

PART OF OXFORD IN THE 12TH CENTURY

OXFORD



CHRIST CHURCH, OXFORD

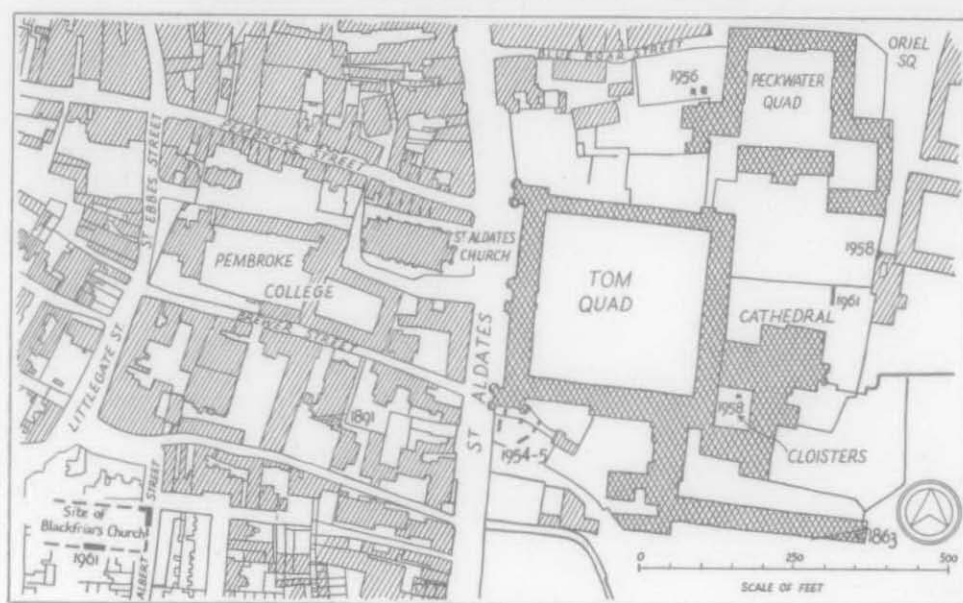


FIG. 1

The relationship of Christ Church to medieval Oxford. River gravels are shown by stippling in the top left-hand map; the top right and bottom maps are at the same scale.

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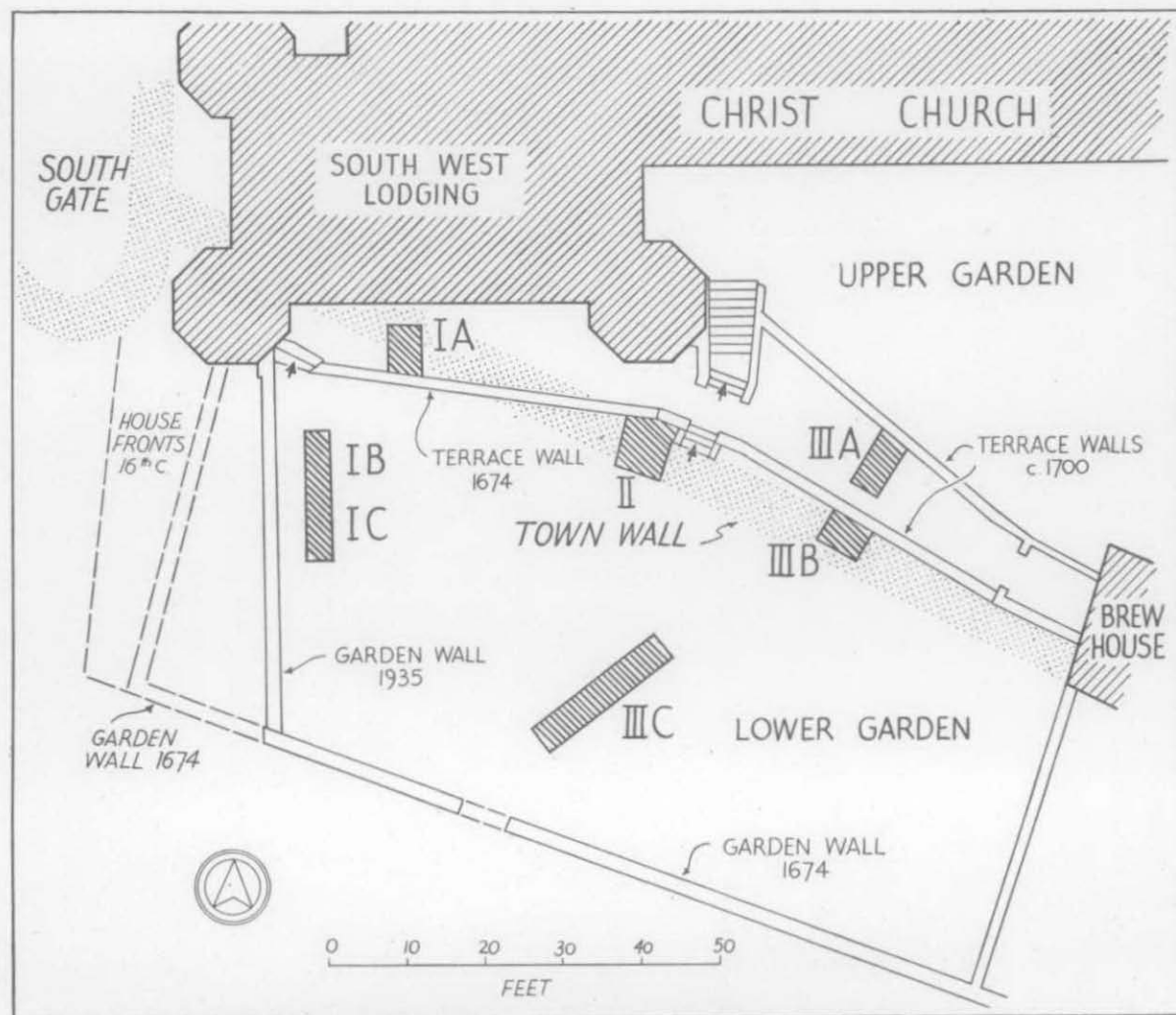


FIG. 2

Plan of excavations in the garden of the South-west Lodging (1954-5). Scale 1 : 288. Pp. 19-27.

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1632 to 1959 by the Regius Professor of Hebrew as holder of the Sixth Stall.¹ The siting of the cuttings was governed to an unusual degree by the existing trees and modern drains (FIG. 1, 1954-5; FIG. 2).

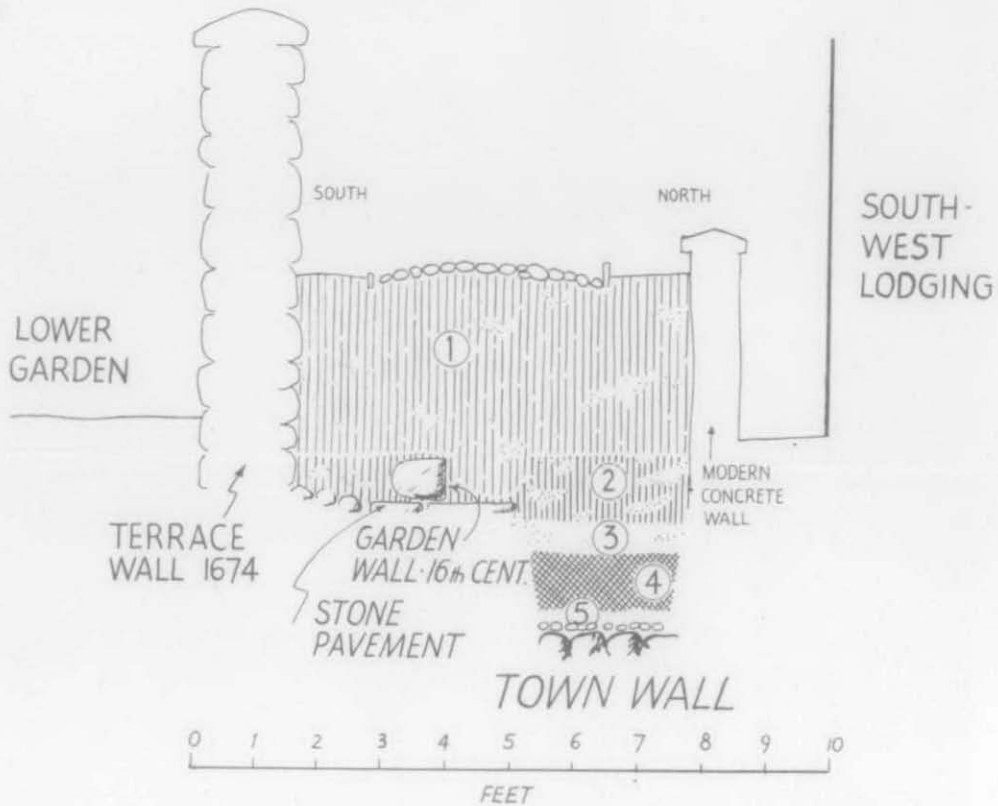


FIG. 3
Cutting 1 A, west section. Scale 1 : 36.

CUTTING 1 A (FIG. 3)

Layers	Finds
1. Cobbled path, black garden loam and brown gravelly loam.	Pottery, 18th century.

¹ An Elizabethan Canon's family in the lodging is charmingly evoked by Elizabeth Goudge, *Towers in the Mist* (1938).

EXCAVATIONS IN CHRIST CHURCH

- | | |
|---|---------------------------------------|
| 2. Dark brown gravelly loam.
Rubble footings of wall built on layer 3. | Pottery and glass, late 17th century. |
| 3. Stone pavement and clay with gravel. | Pottery, 16th century. |
| 4. Dark brown loam with charcoal. | |
| 5. Clay with cobblestones.
Rubble with loam. | |

At the base of the cutting was the core of a massive wall at least 5 ft. thick, of rubble set in clay and loam, revealed also in cuttings II and III B with a roughly coursed rear face of large stones up to 1 ft. 6 in. square and 6 in. thick. This is very probably the Town Wall running on a line south of the direct route from Southgate to Bastion 21, so as to include the monastic buildings of St. Frideswide's.^{1a}

On the north and east of the town the wall was rebuilt in stone early in the 13th century.² No evidence of date was found in our cuttings. Southgate itself survived until 1617 between two of the octagonal turrets of the South-west Lodging built with Tom Quad by Wolsey in 1525-30.³ The Town Wall between Southgate and cutting II was demolished at this time, with the Church of St. Michael at the South Gate, to make room for the Lodging.

South of the Lodging was a paved yard whose first cobbled surface, layer 5, proved to be too low and was raised perhaps in the mid 16th century by layers 3 and 4. About the mid-16th century when houses were built on the land to the south, which had been vacant for the previous century, the yard was reduced and a wall built on the pavement. Later, perhaps in 1674, the present terrace wall was built.

CUTTING I B and C (FIG. 4)

<i>Layers</i>	<i>Finds</i>
1. Black garden loam and brown gravelly loam.	Pottery, 18th century.
2. Brown gravelly loam and a gravel path.	Pottery, glass and clay pipe, late 17th century.
3. Light brown clay with gravel.	Pottery, 15th century ⁴ ; Key, 17th century.

^{1a} RCHM, *City of Oxford* (1939), 159-61.

² H. E. Salter, *Records of Mediaeval Oxford* (1912), 76-7.

³ H. E. Salter, *Oxford Council Acts 1583-1626*, O.H.S., LXXXVII (1928), 264, 411.

⁴ *Oxoniensia*, XXIV (1959), 28, FIG. 12, no. 7.

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C4. Pink clay laid against a rubble wall-footing.

B4. Gravel.

5. Brown loam containing a rough rubble wall-footing.

B6. Charcoal with loam.

C6. Gravel with dark brown loam.

7. Gravel.

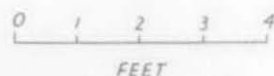
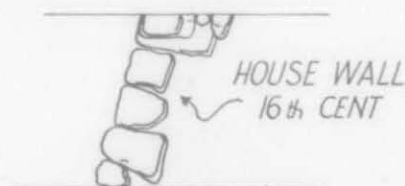
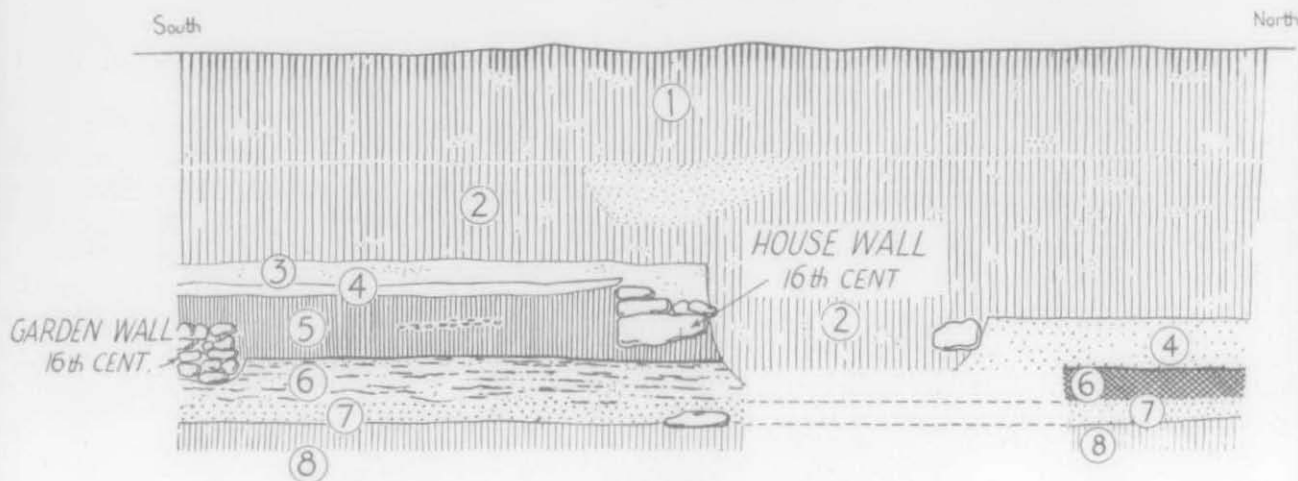
8. Grey silt.

Pottery, 16th century, and much oyster-shell.

Pottery, 12th to 15th century.⁵

Pottery, 11th and 12th century, see below, p. 35, FIG. 10.

SECTION



PLAN

FIG. 4
Cutting I B (to North) and I C (to South), west section. Scale 1 : 36.

⁵ *Oxoniensis*, xxiv (1959), 28, FIG. 12, no. 8.

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The fine grey silt, layer 8, shown by probing to be at least 5 ft. deep, were deposited by a large stream running east and west, which was perhaps the only defence of Saxon Oxford on the south. The bed of this stream had been previously discovered to east⁶ and to west⁷ of the excavations (FIG. 1). This stream was probably disused late in the 11th century when Grandpont, a long causeway and bridge leading to the south, was built.

Trill Mill stream, with its pair of mill-leats running one each side of Grandpont, was most probably excavated at about this time,⁸ the large natural stream being left to silt up. From the evidence of this cutting the stream had silted up completely by the late 12th century, when a clean gravel floor or yard (layer 7) was laid over it. This layer represents a reclamation of waste land for development, at a time when much land in Oxford was being split up and new roads opened for new housing. By 1190 arrears of rent were being claimed from houses on this site.⁹

In cutting 1c the floor or yard, raised with infrequent new spreads of gravel, layer 6, continued in use until the 15th century. For part of the 16th century the land lay open as a garden or rubbish tip (layer 5). Later two small houses were built.¹⁰ Their floors were found (layers 3-4), together with the footings of the dividing wall. In 1674 the houses were demolished to provide a garden for the Canon of the Fifth Stall, housed in Tom Quad Staircase 8 by the Cathedral.¹¹

CUTTING II (FIG. 5)

The top of the Town Wall was revealed in this cutting beneath 3 ft. 6 in. of brown gravelly loam with early 18th century pottery and glass. Above and astride it were the footings of a wall containing re-used medieval stones, built probably under Wolsey as a face for the butt end of the Town Wall, to link it with the nearby turret of the South-west Lodging. The Town Wall had been demolished from South Gate to this point probably to reveal the main south façade of the Lodging. The Town Wall eastward to the Brewhouse was retained as a terrace wall, shown in Loggan's engraving of 1675,¹² and finally destroyed early in the 18th century, to be replaced by the present terrace wall and steps linking the upper and lower gardens.

⁶ *Proc. Oxford Arch. Soc.* (N.S.) I (1860-4), 218.

⁷ H. Hurst, *Oxford Topography*, O.H.S. xxxix (1899), 33.

⁸ D. B. Harden, *Dark Age Britain* (1956), 238, 244.

⁹ S. R. Wigram, *Frideswide's Cartulary* i, O.H.S. xxviii (1894), 158-9.

¹⁰ H. E. Salter, *Oseney Cartulary* iii, O.H.S. xci (1931), 10-11.

¹¹ H. E. Salter, *Survey of Oxford* i, O.H.S. N.S. xiv (1960), 233.

¹² David Loggan, *Oxonia Illustrata* (1675), PL. xxvii.

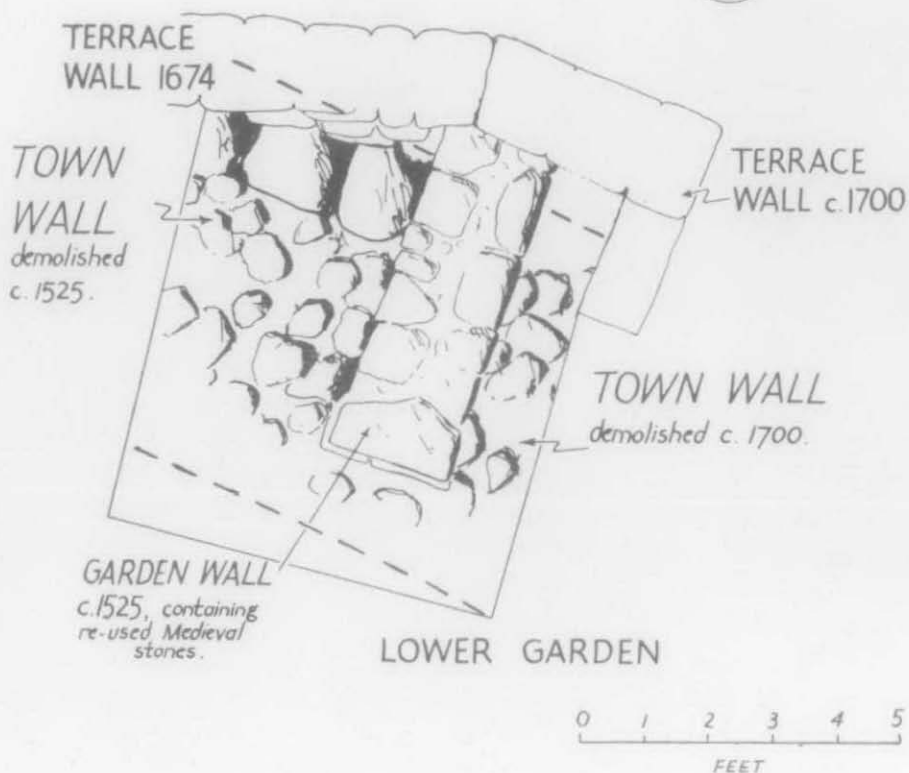


FIG. 5
Cutting II, plan, p. 25. Scale 1 : 36.

CUTTING III A (FIG. 7)

Layers

1. Black garden loam and brown loam.
2. Brown loam with clay.
Three walls of coursed rubble bonded together.

Finds

Pottery and clay pipe, late 17th century.

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3. Gravel floor over gravel with stones. Medieval tile and bronze clasp.
Two walls of coursed rubble, not bonded.
Undisturbed gravel.

CUTTING III B (FIG. 7)

1. Black garden loam and brown gravelly loam. Pottery, 16th century, utilized flint (p. 33, FIG. 9).
Massive rubble wall.
2. Brown loam with clay.
3. Dark brown loam.
Undisturbed gravel.

Cuttings III A and III B were excavated to the natural rock, gravels of the Summertown-Radley terrace, on which the ancient town stands, here found sloping steeply to the south at the edge of the terrace. In cutting III B the Town Wall (see above, p. 23) was found, constructed on the slope. A wall remained on this line until early in the 18th century (see above, p. 25).

In cutting III A, portions of two walls were found directly above the gravel and are perhaps part of the Church of St. Michael at the South Gate. In the 16th century they were demolished (layer 3). Above them was built a stone rubbish pit or sump. Early in the 18th century the upper terrace was set back from the Town Wall to the present line to the north of the sump which was demolished.

Cutting III C was excavated to a depth of 6 ft. through brown loam with much animal bone, oystershell and pottery of 18th century date with many earlier sherds.

Similar accumulations of the late 17th and 18th century from 2 to 4 ft. deep were observed in all the cuttings.

EXCAVATIONS ON THE SITE OF EAGLE HALL (1956)

By N. P. BAYNE

In the land west of Peckwater Quadrangle and south of Blue Boar Street, now a car park, two cuttings were dug in 1956, to examine ancient levels. The site is that of Eagle Hall, a haunt of Welsh lawyers in the 15th century¹³ which fronted on to St. Edward Street or Vine Hall Lane, of which the

¹³ H. E. Salter, *Oseney Cartulary* i, O.H.S. LXXXIX (1929), 333.

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northern half survives as Alfred Street. The following were discovered in cutting I which was 7 ft. 6 in. square (FIG. 6) :

Layers and pits

1. Loam and mortar.
2. Black garden loam.
3. Brown gravelly loam.
- Pit 1. Brown gravelly loam and sand.
- Pit 2. Black loam.

Finds

- Pottery, 18th century and much medieval.
Pottery, 16th and 17th century.
Pottery, 15th century.
Pottery, 15th century.
Pottery, 12th century.

Pit 1 had been dug from layer 3 into pit 2. Pit 2 had been dug into undisturbed gravel, which was found only at the east end of the cutting at a depth of 7 ft. 6 in.

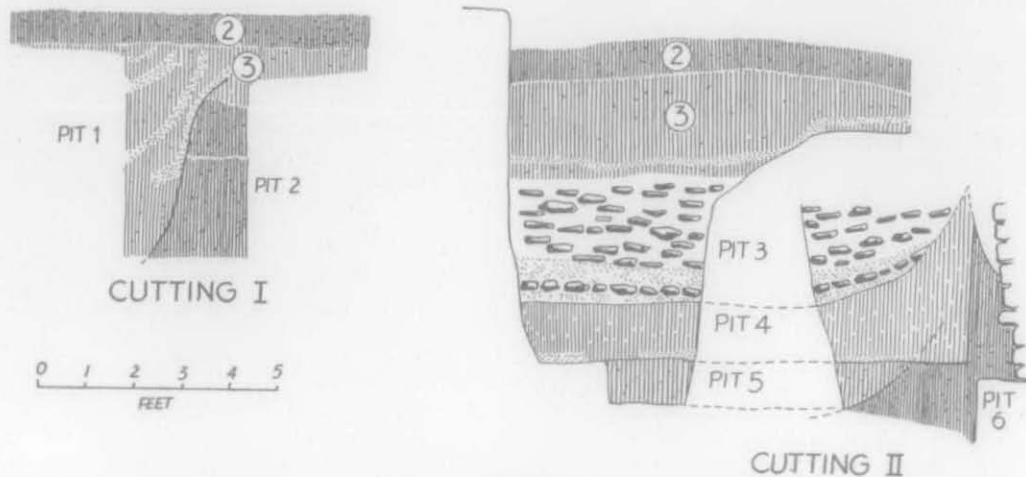


FIG. 6
West section in cutting I, and east and part of south section in cutting II on the site of Eagle Hall (1956). Pp. 27-9. Scale 1 : 48.

In cutting II, 10 ft. square, an 18th century drainage-sump of unmortared rubble with a brick barrel-vault was found. This was opened and one wall removed to reveal the same three upper layers as in cutting I. Below were found the following :

Pits

- Pit 3. Brown loam, stones and spreads of gravel.

Finds

- Token, glass, thimble, sickle-blade, pottery, 15th century.

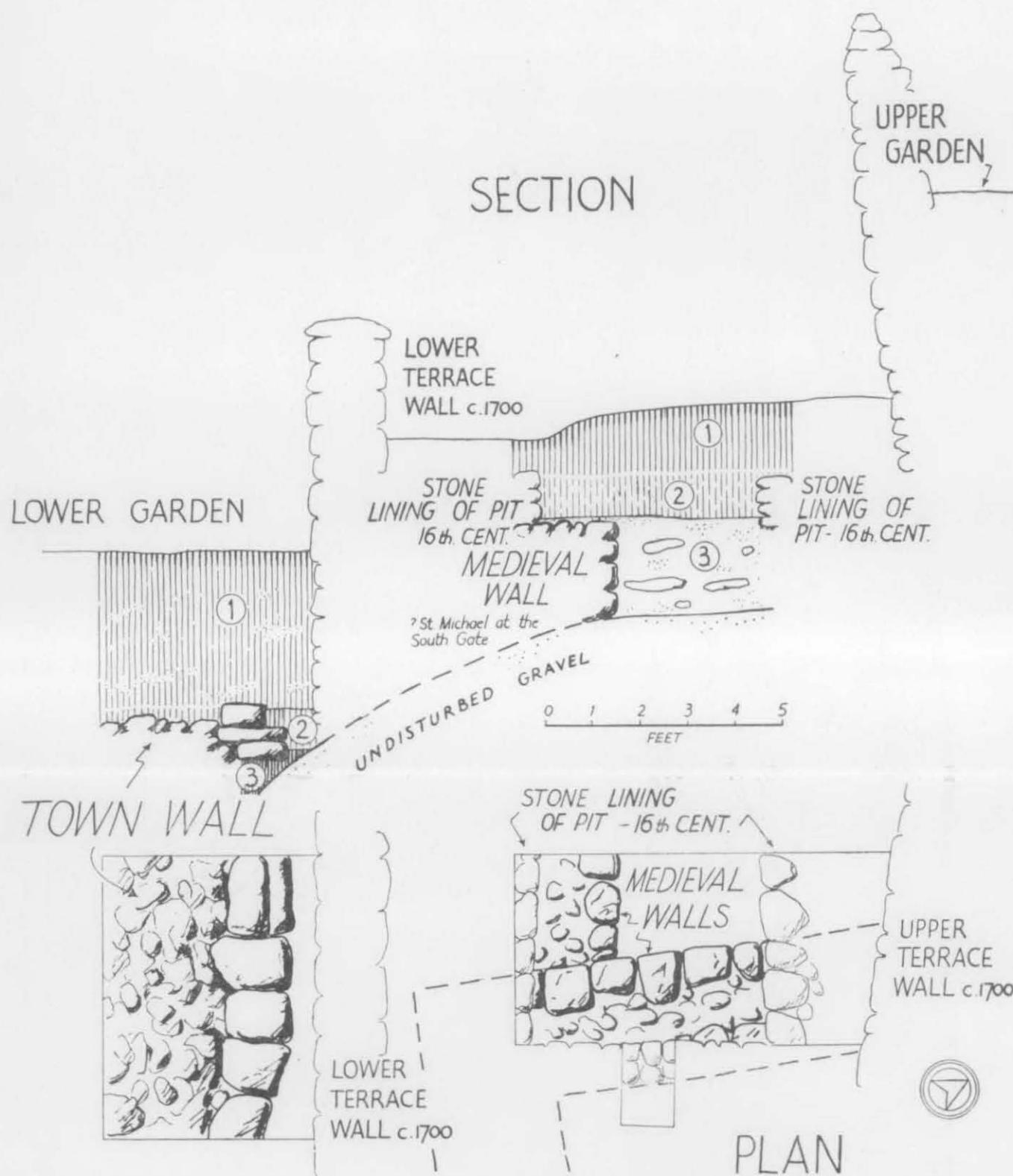


FIG. 7
Cuttings II 1A (to North) and III B (to South), west section and plan. Pp. 26-7. Scale 1 : 36.

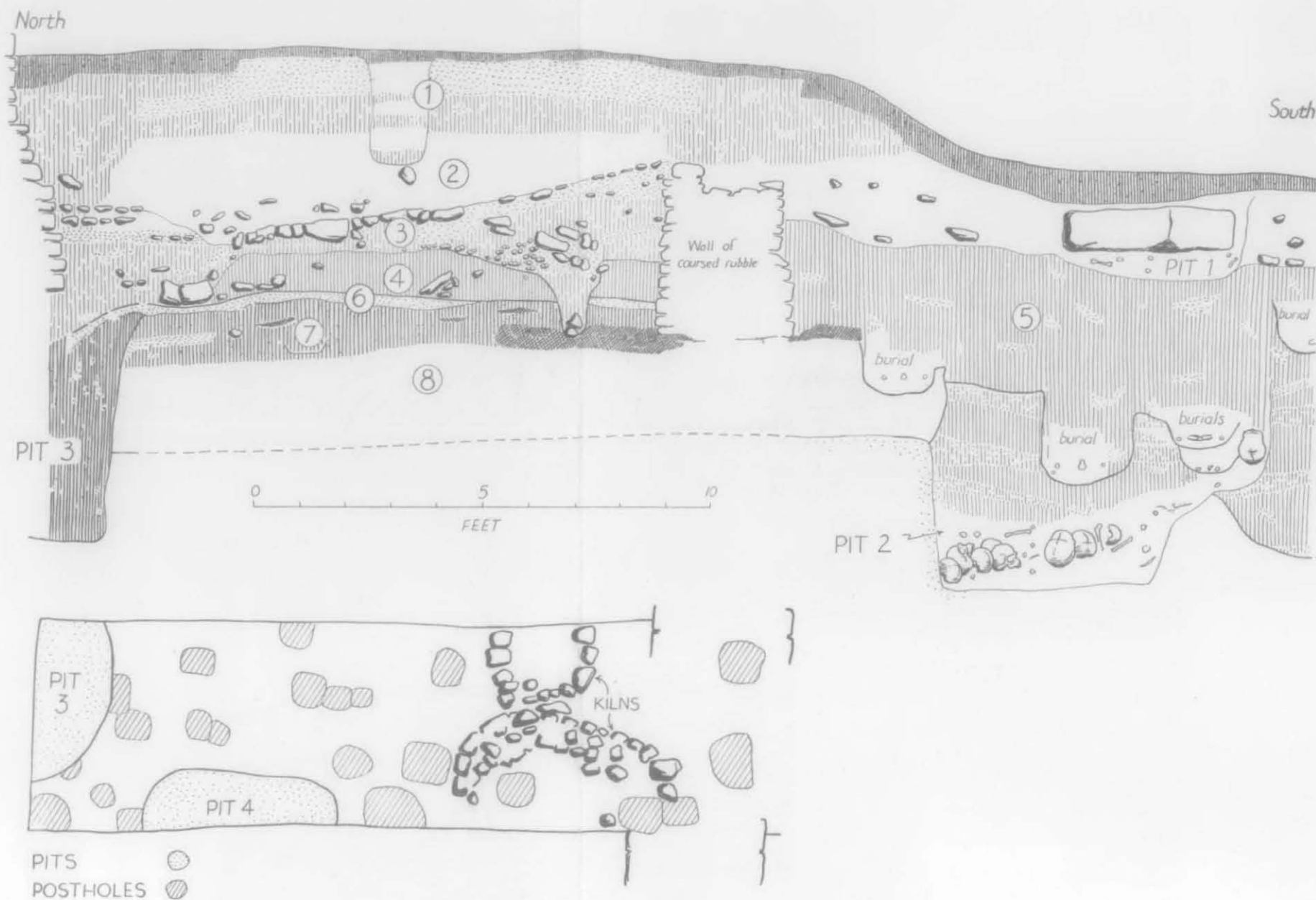


FIG. 8

Section of cutting and plan of layer 7 in the Cathedral Garden (1961). Pp. 30-1. Scale 1:36.

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Pit 4. Light brown loam.	Pottery, 14th century.
Pit 5. Dark brown loam.	Pottery, 14th century.
Pit 6. Black loam.	Pottery, 12th and early 13th
Undisturbed gravel.	century (see below, p. 35, FIG. 11).

Pits 3 to 5 had been dug successively through each other within pit 6, and provide a sequence of Late Medieval pottery. In neither cutting was the original red loamy topsoil observed *in situ* on undisturbed gravel. It had been entirely removed in digging for pits 2 and 6, but has been observed less than 50 yd. to the north at a depth of 5 ft. 9 in.

The area was the College timberyard in the 16th century¹⁴ and a Canon's garden in the 18th century (layer 2).¹⁵ The great depth of later deposit (layer 1) was probably dumped during the excavation of cellars in the rebuilding of Peckwater Quadrangle in 1706-13.

EXCAVATIONS IN THE CLOISTERS (1958)

A cutting 6 ft. by 3 ft. in connection with the relaying of heating pipes was sunk in 1958 in the Cloisters of the former Priory of St. Frideswide against the north end of the rubble footings which have the shape of a Cross of Lorraine. These footings were exposed in the centre of the Cloisters in 1871 and had formed a puzzle to historian and architect, with date and purpose both unknown.¹⁶

Undisturbed gravel was found at a depth of 2 ft. 6 in. A number of medieval graves had been dug up to a foot into the gravel or lay in the brown loam above. A large pit was cut, perhaps in the 16th century, through the graves and the natural gravel to a depth of over 6 ft., and refilled with the same material, brown loam with much gravel containing many human bones, some of them broken from bones in the graves and representing at least 11 skeletons. This excavation was perhaps a charnel-pit. Into the filling of this pit a trench had been dug 4 ft. 8 in. deep, in which the stone footings were constructed of mortared rubble containing fragments of stone window-heads cusped in 15th or 16th century style.

The footings are of 16th century date or later. They can perhaps be connected with Wolsey's building of Cardinal College, now Tom Quad, in 1525-30. On the other hand, they may represent an abortive scheme of rebuilding in 1669 after the east range of the cloisters, now the Priory House, was largely destroyed by gunpowder to halt a fire in the buildings to the south.¹⁷

¹⁴ N. Denholm-Young, *Medieval Archives of Christ Church*, O.H.S. xcii (1931), 197.

¹⁵ W. Williams, *Oxonia Depicta* (1733), PL. xli.

¹⁶ S. A. Warner, *Oxford Cathedral* (1924), 38.

¹⁷ A. Clark, *Wood's Life and Times* ii, O.H.S. xxi (1892), 175-6.

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EXCAVATIONS IN THE CATHEDRAL GARDEN (1961)

The garden attached to the Canon's lodging north of the Cathedral lay vacant following the recent suspension of a Canonry. The garden comprised the greater part of the parochial churchyard north of the Church of St. Frideswide and also the road bounding it on the north. A cutting 30 ft. by 5 ft. was excavated to section the road and extend into the churchyard to the south. The following layers were found (FIG. 8) :

1. Black garden loam, a gravel path and brown loam with gravel. The upper footings and existing north garden wall were built in a trench dug through this layer.

2. Lime mortar with stones. Pit 1 was dug from layer 1 and filled with human bones.

3. Floors of stones set in gravel and loam, and loam with gravel and stones, with late 16th century pottery and a token. The lower footings and stump of the previous north garden wall, below the present one, were built in this layer.

4. Brown loam with 14th century pottery.

5. Brown loam with gravel and many extended inhumation burials. Pit 2 was cut from layer 5 through the natural loam and gravel, and filled with layers of red-brown loam and brown gravelly loam containing many human bones, piles of skulls and long-bones, and also extended inhumation burials with 12th and 13th century pottery and tile.

6. Compacted gravel with streaks of black loam. A massive wall of coursed rubble, across the centre of the cutting, appeared contemporary with this layer.

7. Spreads of gravel, loam and clay in which were excavated a number of postholes, some extending into layer 8, and also portions of two kilns or ovens (Plan, FIG. 8). Among these, 11th and early 12th century pottery and objects were found. Pit 3 had been excavated from layer 7 through the natural loam and gravel. The filling was brown gravelly loam with pottery of early 12th century date.

Pit 4 appeared to have been dug also from layer 7 and was filled with dark loam containing 11th century pottery (see below, p. 34, FIG. 10).

The natural loam, layer 8, was paler than usually found under Oxford; its unusual depth indicates dumping. It was not fully excavated; struck flints were found in it and also in all the upper layers (see below, p. 33). It is worth noting that the site resembles that of the causewayed camp at Abingdon, standing on the extreme southern tip of a gravel peninsula between two streams. Find of Neolithic date has been made nearby (FIG. 1).

EXCAVATIONS IN CHRIST CHURCH

Areas of Late Saxon occupation found in Oxford have usually been greatly disturbed by later medieval pits and structures. And here, to the south, layer 7 had been destroyed in digging medieval graves, many of them of infants (layer 5), and by the large charnel pit, pit 2. To the north too in the Dean's garden, little probably remains under the 12th and 13th century house fronting south on to the road. But layer 7 was sealed under a road in the 12th century and retained, visible through its layers of clay and gravel, postholes filled with brown gravelly loam. The postholes represent at least three successive structures. Portions of two kilns or ovens of local limestone rubble set in clay and burnt red, attest some industrial activity, such as baking or smelting. Samples taken by Mr. G. Weaver of the Research Laboratory for Archaeology and the History of Art, indicate a date before the 12th century (see below, p. 37). Sections were also excavated of two pits of 11th and early 12th century date, dug from these levels. The careful clearing of a large area here will provide much information on late Saxon Oxford.

Layer 6 is the thin gravel surfacing of a road cut through the earlier houses in the early or mid 12th century, when much of Oxford was replanned. A single layer of gravel metalling on the road may be compared with three at Logic Lane on a road in use from the 12th to the mid 15th century (see below, p. 46). On the south side of the road the churchyard wall, found in the centre of the cutting, was probably also built in the 12th century. At the same time the churchyard was extended over sites of earlier houses. The work here was perhaps connected with the re-foundation of St. Frideswide's church as a Priory of Augustinian Canons in 1122 and with the rebuilding of the church, planned probably in the middle and achieved in its present form towards the end of the 12th century.

Layer 4 represents accumulation on the surface of the disused road. The road was closed probably in the 14th century and incorporated into the garden of Vine Hall on the north. Stables were probably built here after the foundation of the college in 1546; their floors, resurfaced with hard use, remain as layer 3. The wall at the north of the cutting was first built at this time. At the beginning of the 17th century the road leading to the stables was closed for Corpus Christi College (see below, p. 32) and about this time the stables and the churchyard wall were demolished.

Layer 2, of mortar or disintegrated limestone is the debris of the stables. The site was then formed into a terrace for the garden for the Canon of the Fourth Stall, with the gravel path visible in Loggan's view of 1675.¹⁸ The wall at the north end of the cutting was rebuilt in the 18th century on the stump of the old.

¹⁸ David Loggan, *Oxonia Illustrata* (1675), PL. XXVII.

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II. CORPUS CHRISTI COLLEGE (FIG. 1)

During the rebuilding of the President's Lodging at Corpus Christi College in 1958 a small section was observed under the boundary wall with Christ Church on the line of the new façade. Here the houses fronting east on Shidyerd Street had decayed and were enclosed by Canterbury College in about 1365.¹⁹ This site is now part of the Deanery Garden at Christ Church. The road was enclosed by Corpus to build the President's Lodging early in the 17th century.²⁰ The wall of 1365, now between Christ Church and Corpus, was set back 2 ft. from the road, and rebuilt in the 18th century, with the south wall of the Deanery Garden (see above, p. 31). Layers of gravel road-metal appeared to be 3 ft. thick at a depth of 3 ft. 6 in. Under the wall, at the same depth, occupation layers of the houses with 12th and 13th century sherds continued to a depth of 7 ft. Natural gravel was not found.

III. BRASENOSE LANE

In 1961 a drainage trench at the east end of Brasenose Lane revealed the following layers :

1. Tarmacadam, clay and stones.
2. Dark brown compacted gravel with clay and late medieval tiles.
3. Loose brown gravelly loam.
4. Red to dark green compacted gravel at a depth of 4 ft.
5. Brown gravelly loam with Late Saxon pottery (see below, p. 35, FIG. 10).
6. Red-brown loamy topsoil over undisturbed gravel at a depth of 6 ft. 3 in.

Over the natural loam, about 2 ft. of loam (layer 5) accumulated during the Late Saxon period. Layers 2-4 represent a medieval road. Here too, a side road was laid out after Late Saxon times ; houses are first mentioned in the road in about 1188.²¹

¹⁹ W. A. Pantin, *Canterbury College* iii, O.H.S. (N.S.) viii (1950), 10.

²⁰ H. E. Salter, *Oxford City Properties*, O.H.S. lxxxiii (1926), 118-9.

²¹ H. E. Salter, *Survey of Oxford* i, O.H.S. (N.S.) xiv (1960), 63.

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THE FINDS

UTILIZED FLINT (FIG. 9)

By H. J. CASE

Cutting III B

A two-edged flint flake-knife (no. 1), with fine scaly unifacial retouch at both edges, was found in layer 1 in the excavations in the garden of the South-west Lodging in 1954-5. This implement is appropriate to a Neolithic industry, such as at Abingdon.

The Cathedral Garden (1961)

21 pieces of utilized flint were found, including 2 fragmentary pot-boilers. 4 other pieces show fire-reddening or pitting, possibly to some extent due to Late Saxon activity. The raw material, where determinable, appears to have come from derived deposits; a black and a brown variety were used. 6 pieces were glossy and unpatinated; 4 had speckly to dense white patina, one showing unpatinated rechipping; 7 were indeterminate. 5 pieces, besides nos. 2 and 3 below, show marks of use.

Noteworthy pieces are:

2. A hollow-based arrowhead of unpatinated brown flint. An uncommon form, occurring in Early Bronze Age context in Wiltshire:²² but its range cannot be dated confidently. If lacking retouch on one edge or the other, this specimen could have been classified among so-called transverse derived or *petit-tranchet* derivative arrowheads, which have a Late Neolithic—Early Bronze Age range.²³

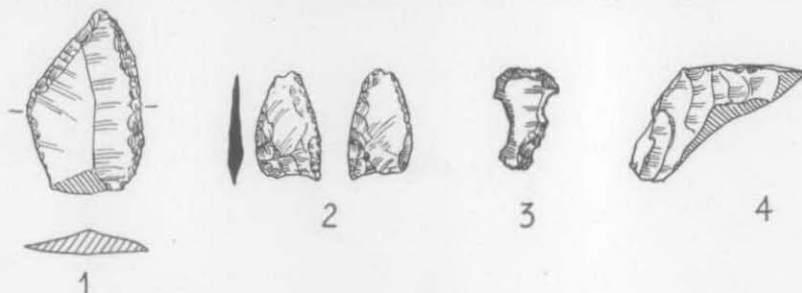


FIG. 9

Utilized flints. 1, 2, 4: Scale 1:2. 3: Scale 1:1.

3. Microlithic piercer of unpatinated brown flint, very small but not typically Mesolithic.

4. Core-changing flake with intermediate patina, long facets, Mesolithic or Neolithic.

The assemblage may be mixed and cannot be dated precisely, but is important as showing the densest concentration of prehistoric finds in Oxford (for other finds, see below, pp. 39-43).

²² Aldbourne: *W.A.M.*, xxviii (1895), 262-3.

²³ *Arch. J.*, xci (1934), 50-5.

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11TH CENTURY POTTERY (FIG. 10)

Excavations in the Cathedral Garden, 1961, pit 4 (nos. 1-5)

The pottery from this pit was of fairly hard shelly ware with grey core and light red to dark grey surfaces, much blackened by fire on the outside (nos. 1-4). This ware was made locally and is probably derived from the St. Neots ware, a smoother shelly ware (see below, p. 54). One sherd of Stamford ware was found, of very fine hard light grey ware with a thin crackled olive glaze. There was also part of a small bowl of fine sandy pale buff ware with on both sides a thick purple glaze which has many bubbles and lumps (no. 5). On the outside is a stamped pattern

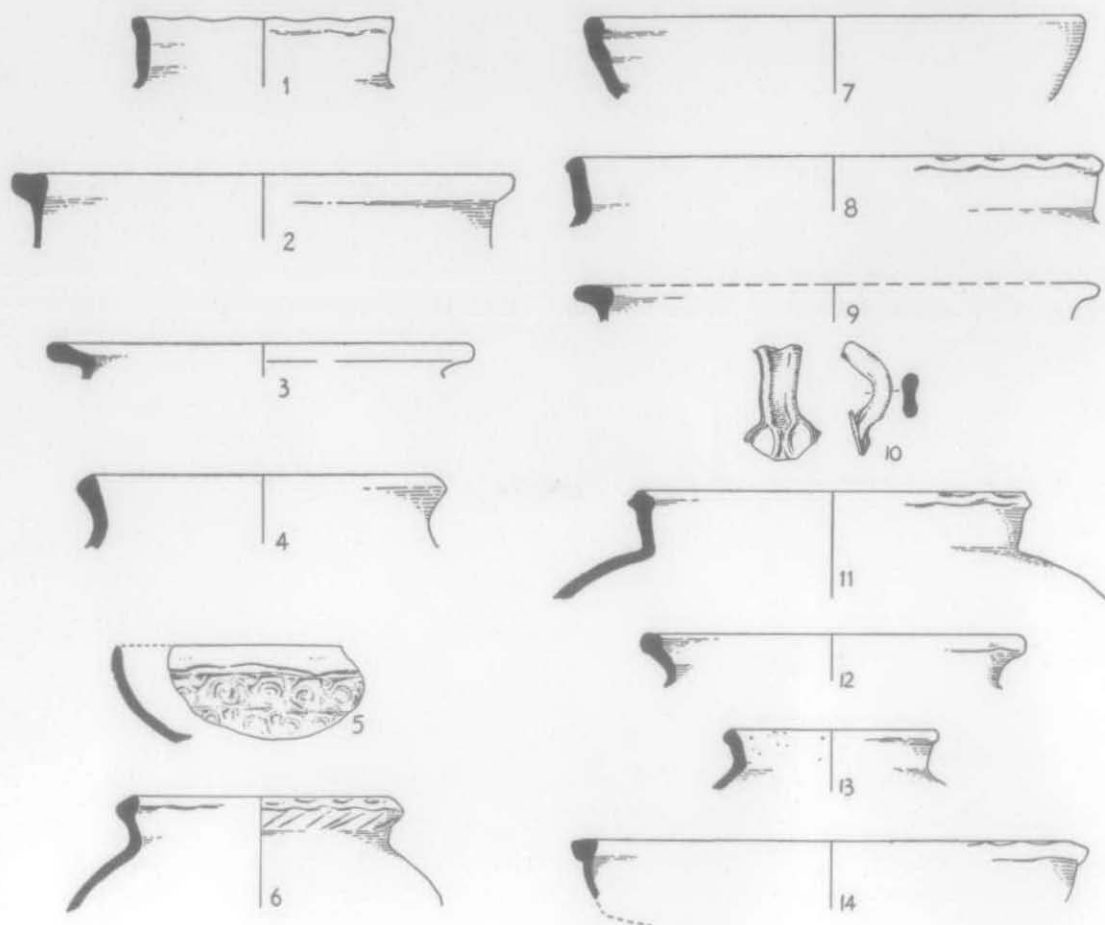


FIG. 10
11th and 12th century pottery. Scale $\frac{1}{4}$.

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repeated continuously. Bowls of a similar type have been found at Crowland Abbey, Lincs.²⁴ and in Aldermanbury, London.²⁵ A date about the middle of the 11th century is indicated for the filling of this pit.

Brasenose Lane, 1961, layer 5 (nos. 6-10)

The sherds which appeared to come from this layer were mostly of the hard shelly ware discussed in the previous section (nos. 6, 8, 9). There was also a fragment of a bowl of hard grey sandy ware (no. 7) and a handle of a pitcher of Stamford ware of very fine hard ware, off-white in colour with a fine pale yellow glaze.

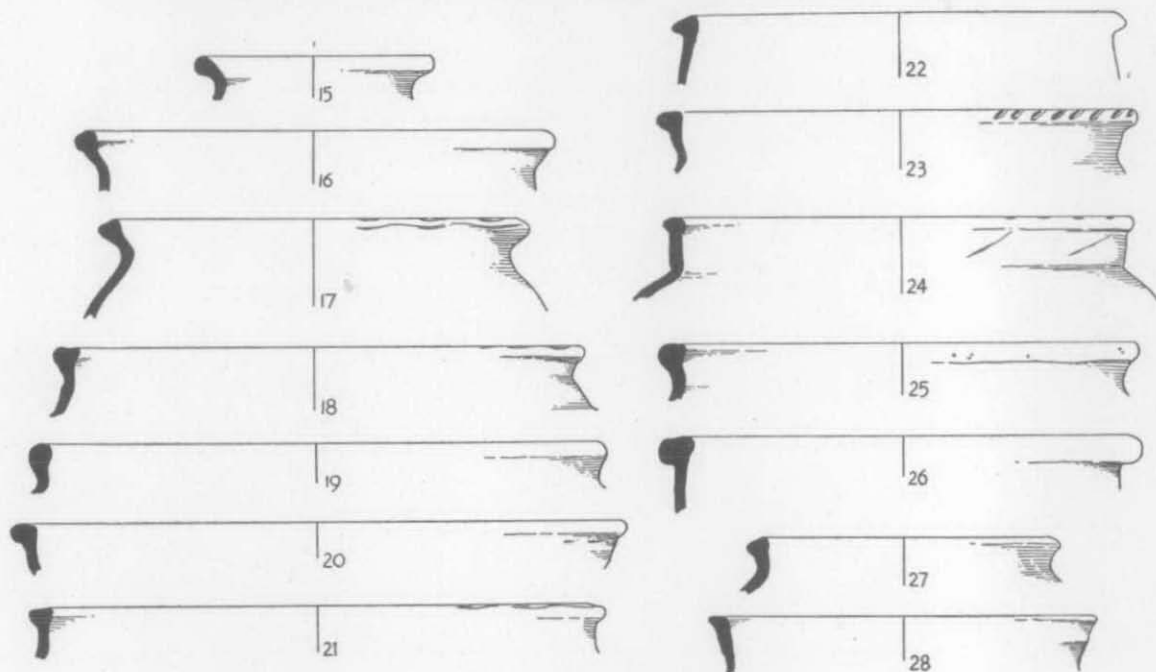


FIG. 11
12th century pottery. Scale $\frac{1}{4}$.

12TH CENTURY POTTERY (FIG. 11 see below, pp. 60-2)

Groups of pottery from 12th century contexts were found in cuttings 1 B and c, layer 8, in the garden of the South-west Lodging in 1954-5 (p. 24) and in pit 4 in the Cathedral Garden (p. 30). The former group comprised two sherds of tripod pitcher, 10 of hard shelly ware (no. 13) and 19 of unglazed hard sandy ware (nos. 11, 12, 14). In the latter were two sherds of tripod pitcher, 15 of hard shelly ware

²⁴ *Cambridge Antiq. Soc.*, LI (1957), PL. v, p. 54.

²⁵ R. E. M. Wheeler, *London Museum Catalogues*, VI (1935): *London and the Saxons*, 187; FIG. 44, no. 2.

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and 31 of unglazed hard sandy ware. Pottery of late 12th or early 13th century date was found in pit 6 in the excavations on the site of Eagle Hall (p. 29). Three sherds of tripod pitcher were found and also three sherds of hard sandy ware with green speckled glaze, 28 of very hard shelly ware (nos. 17, 19, 20, 22-6, 28) and 35 of unglazed hard sandy ware (nos. 16, 18, 21, 27). A few sherds of St. Neots ware also occurred.

MAGNETIC MEASUREMENTS OF LATE SAXON KILNS OR OVENS

By G. H. WEAVER

Eleven samples were taken from the structures for magnetic dating (see above, p. 30). The directions of magnetization were measured on the spinning magnetometer at the Research Laboratory for Archaeology and the History of Art.²⁶ The following results were obtained:

Sample Number	Inclination Degrees	Declination Degrees East of True North	% Viscous Magnetization
CC 1	70.2	29.7	2.4
2	63.7	30.1	10.0
3	67.5	18.3	3.8
4	65.5	20.0	0.6
5	61.4	27.5	3.1
6	65.7	13.3	15.5
7	65.0	39.0	1.5
8	68.1	29.1	3.8
9	63.2	34.3	4.9
10	71	0.4	18.0
11	-54.0	100.6	7.6

The viscous magnetization of the samples was measured by storing the samples first in the same position relative to the earth's magnetic field, as when *in situ* in the kiln and then, after measurement, so that the samples' magnetization and the earth's magnetic field were opposed. Each storage lasted three weeks. The average change in intensity was about 5%. There is no correlation between the deviation of a given sample from the mean direction, and its magnetic viscosity. The effects of viscosity on the mean have consequently been ignored.

In subsequent calculations samples 10 and 11 were omitted, CC 10 was too weakly magnetic to give consistent results and CC 11 was apparently not found *in situ*.

The mean direction of magnetization of the remaining nine samples is given

²⁶ M. J. Aitken, *Physics and Archaeology* (1961), 144-7.

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by an inclination of 65.8° , and a declination of 27.0° East. The 95% confidence limits on these angles are respectively $\pm 2\frac{3}{4}^\circ$, and $\pm 5\frac{1}{2}^\circ$ i.e. there is only a chance of 1 in 20 that the true mean inclination for the magnetization of the structure lies outside the range 63° to $68\frac{1}{2}^\circ$, and that the true mean declination lies outside the range $21\frac{1}{2}^\circ$ E. to $32\frac{1}{2}^\circ$ E. This accuracy represents an overall period of about 80 years, assuming a similar rate of change of the earth's magnetic field direction, as has been observed during the past 400 years.

The structure cannot be dated at present owing to the lack of data on the field direction in the era 400 A.D. to 1200 A.D., but one may assert with reasonable confidence that the structure is contemporary (to within 80 years) with a kiln containing wasters of Thetford ware, excavated at Ipswich, by Mr. N. Smedley, in 1961, and sampled by the Laboratory. This assertion is based on the assumption that both structures were undisturbed when sampled.

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