The Infirmary and Hall of the Medieval Hospital of St. John the Baptist at Oxford

By BRIAN DURHAM

with contributions by JENNIFER ALEXANDER, PAMELA GRAVES, JULIAN MUNBY, MAUREEN MELLOR, RICHARD MORRIS, MARK ROBINSON and NICOLA ROGERS

SUMMARY

When Oxford's Magdalen College prepared to move its kitchens in 1987 it provided a chance to study the medieval hospital which occupied this site from 1231 to 1457. The old kitchens were in a stone building which has been confirmed as one of the last survivors of the hospital structure, although its roof proved to date from the time of the main college building campaign c. 1474–80. Rescue and salvage excavation on the site chosen for the replacement kitchen showed it to be the eastern part of the hospital's infirmary, a major twin-halled structure which was previously unsuspected.

The infirmary and probably the whole of this south-east corner of the hospital proved to have been built on its own artificial embankment at the edge of the river Cherwell. The arrangement of excavated pier-bases was so complex yet so deliberate and unified that it has prompted speculation on the objectives of those who planned and built this centre-piece of the hospital, not least in the provision of a culverted water supply so close to the river Cherwell at what may have been the chapel end of the infirmary.

The infirmary formed a right-angle with the south end of a riverside range (the later college kitchens), shown by survey to have been a medieval open hall with superior features, and tentatively identified as accommodation for the head of the hospital community. The narrative account describes its conversion through several stages of college kitchen and eventually to its present status as junior common room.

CONTENTS

1	Introduction	19	
2	Acknowledgements	21	
3	Documentary background		
	3.2 The Property of the Hospital of St. John, Oxford, by Julian Munby		
4	The Field Investigations (inc. Orientations): 4.1 Kitchen Yard Excavations 4.1A Trial Trenches	26	
	4.1B Trenches IV V and VI		

Rescue Excavation Stage A

Rescue Excavation Stage B: Hospital Levels Rescue Excavation Stage C - The Primary Structure of the Infirmary 4.1C The Infirmary Culvert F90 etc. 4.1D Excavation Stage D - Watching Brief 4.2 Survey of the Old Kitchen 35 4.2A Architectural Background 4.2B The Survey 4.2C The Roof and Tree Ring Dating 4.2D The Walls and Below-ground Archaeology 4.2E The Medieval Doorway 4.2F Below-ground Deposits in the Kitchens 4.2G The Kitchen Survey: Discussion of the College Phases 5 The Finds 49 5.1 Development Phases 5.2 The Pottery, by Maureen Mellor 5.2A Pottery from the Pre-hospital Dumping 5.2B Pottery from the Hospital Levels (Phases 3a and 3b) 5.2C Early College Levels (Phase 4) 5.2D Appendix: Petrology of New Fabric-types 5.3 Coin finds, by Nicholas Mayhew 5.4 The Metal Finds, by Nicola S.H. Rogers 5.4A Ironwork 5.4B Copper Alloy 5.5 The Tiles, by Maureen Mellor 5.5A Floor tiles 5.5B Roof Tiles 5.6 Clay Pipes, by Maureen Mellor 5.7 Window Glass, by C. Pamela Graves 5.8 Human Bone. Identifications by Mary Harman 6 Plant and invertebrate remains from 13th-century silt beneath the hospital buildings, by Mark Robinson 60 7 Discussion and Conclusions 60 7.1 Land outside the East Gate in 1231 7.2 The Hospital Site 7.3 Construction Sequence of the Hospital (Phase 2) 7.4 Construction of the Infirmary 7.5 Speculation on the Design Objectives indicated by the Infirmary Layout 7.6 The Water Supply 7.7 Infilling the Infirmary Floors 7.8 The Hospital Hall 7.9 The Life of the Infirmary (Phase 3) 7.10 Hospital Buildings in the College Period (1458 onwards, Phase 4)

INTRODUCTION (Fig. 1)

To the care of the sick and the benefit of poor students and other miserable persons

T hese words translate the objectives of the hospital of St. John the Baptist, the most important charity of medieval Oxford.¹ It was established on its second site by Henry III in May 1231, at a formative time in the development of the town: less than four months previously the king had issued the first grant of privileges to the scholars of Oxford and thereby confirmed them as a 'university';² the Franciscan and Dominican friars had chosen the town for some of their earliest houses in England; and the murage grants show that there was a big investment in improving the town walls. The known architecture of the friaries and the city walls is on a grand scale, and the hospital of St. John may have followed their lead. Until recently however there was no way of visualising the complex as a whole to show its place amongst its local peers, or amongst similar institutions elsewhere.

This was a time of major hospital-building programmes in many parts of England. Knowles drew a distinction between the three hundred-odd hospitals which are first heard of at this time, and those which were being 'refounded' in place of some of the two hundred-odd charitable institutions of other types which had existed in the 12th century.³ The statutes of the new hospitals suggest that they had a stricter rule, and perhaps a function which we would regard today as more 'medical' as opposed to the 'shelter' function of the 12th-century hospices, but there is little firm evidence and the most obvious source of confirmation will be from the architectural design. Hospitals of the reign of Henry III include the earliest surviving examples of 'medical' architecture in England outside the monasteries; the study of a major house like St. John's might indicate whether this flowering reflected a real change in the social conscience of the day, or simply an extension of the new architectural momentum into the area of community service.

Oxford already had a hospital of St. Bartholomew founded by Henry I as a leper house, it had infirmaries in the priory of St. Frideswide and in Oseney Abbey, and by the mid 13th century the Greyfriars and Blackfriars would have had their own infirmaries too (Fig. 1). There is also evidence of parish care in the medieval period, namely a hospital of St. Giles and another of St. Peter, which underlines the assumption that most people would look first to the parish church for medical care. But the only 'general hospital' in the town was St. John's, and the size of its property ownership would have made it one of the most important religious houses in a town of religious houses.

The early history of St. John's Hospital at Oxford is described by H.E. Salter in Volume III of the hospital cartulary, and the architecture as then known is discussed by R.T. Gunther in the same volume.⁴ Most of our knowledge of the buildings is due to J.C. Buckler, who took care to record any antiquities which were exposed during his own work as an architect for the college in the early 19th century. The 'gleams of historical enlightenment' which he captured have provided a framework of fact and interpretation for the present study, and although archaeology in the late 20th century has the

¹ H.E. Salter, Cartulary of the Hospital of St. John the Baptist (hereafter CHStJB), vols. i-iii, O.H.S. lxvi (1914); lxviii (1915); lxix (1916).

² M.B. Hackett, 'The University as a Corporate Body', in J. Catto (ed.), History of the University of Oxford, i, 43, 49.

³ D. Knowles and R.N. Hadcock, Medieval Religious Houses (1971), 40-42, 310-41; M. Rubin, Charity and Community in Medieval Cambridge (1987), 1.

^{*} CHStIB, iii, pp. v-lii, Appendix III.



Fig. 1. Medieval hospitals and infirmaries in Oxford: 1. Oseney Abbey; 2. St. Giles's; 3. St. Frideswide's; 4. St. Peter's; 5. St. John the Baptist; 6. St. Clement's; 7. St. Bartholomew's.

advantage of being able to carry out its own investigative work in productive directions, many of those directions spring from the private work of Buckler himself.⁵

Knowledge of the hospital buildings had brought the OAU into the college on two previous occasions. In 1976 we photographed the 'charnel' in the High Street range as the insertion of a new floor concealed the bases of the vaulting, and at the same time noted a group of unarticulated human bones found by a contractor in the corner of Chaplain's Quad adjoining the charnel (PRN 3599(II)). In 1983 we investigated the floors of the old kitchen at the time when new smoke hoods were being installed, a stop-gap arrangement designed to put off the inevitable day when the old kitchen would have to go altogether, and in the same year the County Museum recorded the roof of the kitchen as part of a survey of four college kitchens.⁶

The standard works on the architecture of medieval medicine are by Rotha Mary Clay and W.H. Godfrey.⁷ It seems that, despite a range of hospital plans and fragments, there

⁷ M. Rubin, op. cit. note 3; R.M. Clay, The Medieval Hospitals of England (1909); W.H. Godfrey, The English Almshouse (1955).

⁵ A transcript of Buckler's 'Notes' (B.L. Addit. MS. 27962) is kept in the college; for a commentary see T. Boase, 'An Oxford College and the Gothic Revival', *J. Courtauld and Warburg Inst.* xviii (1955), 145–88.

⁶ J. Steane, 'Roof of Magdalen College Kitchen', South Midlands Archaeology, CBA 9 Newsletter 13 (1983), 78-9.

is little to show by way of functional comparisons, no rules by which one can predict what a medieval hospital might look like, or by which one can interpret the larger institution from a surviving fragment, as can be done with most monastic houses.

This sense of improvisation in hospital design is scarcely lessened by the extraordinary remains found under Magdalen College. As the fieldwork progressed a series of questions began to formulate into a research design. Was there evidence that Henry III's new hospital was already short of space when the infirmary was built? Why did infirmaries like Oxford and Ospringe in Kent need a water supply? How was the roof of the infirmary built, in the 'aisled' monastic style or the 'twin-halled' style of the charitable hospitals? Was it possible to reconstruct the life of the infirmary and the installation of cubicles, and what was the part played by the culvert and its steps down to the water?

As the study progressed, it became clear that other more fundamental questions could also be addressed, and the scope of the research was widened to question what the builders and their clients may have believed was important at the time of building, the extent to which they were prepared to deviate from the pattern of Gothic architecture as it was developing in the Oxford of their day, and the reasoning which might have motivated them. Was this really the architecture of healing, or should it be seen as an example of 'conspicuous waste' resulting from the availability of superfluous funds in 12th- and 13th-century England, as identified by Miri Rubin for the Cambridge hospitals? Should the building work be seen as the prelude to an inexorable process of decline, leading to the unopposed dissolution of the hospital as Oxford's charitable energy was channelled into increasingly elaborate ritual, with the poor and sick as innocent and helpless onlookers?⁸ This dismal scenario is one of the more fundamental questions which should be asked of the remains beneath Magdalen College.

ACKNOWLEDGEMENTS

The fieldwork and survey was supported financially by English Heritage, Magdalen College, the Manpower Services Commission and Oxford City Council. The Oxford Archaeological Unit is grateful to the President and fellows of Magdalen College for allowing us access to operational areas of the college, and particularly the Senior Bursar, Mr Keith Wills, the Senior History Fellow, Dr Gerald Harriss, and the Clerk of Works, Mr Alan Mount, for their cooperation. Throughout the preparation and execution of the project we were grateful for advice and encouragement from English Heritage and particularly the Inspector A.J. Fleming. Architectural and historical advice was generously provided by John Ashdown, John Blair and Julian Munby.

The writer is particularly grateful to excavation supervisors Gerry Wait, Mike Pinkney and Mark Roberts, surveyors Leigh Turner and Danyon Rey, and to George Lambrick for assistance with the salvage recording. He would like to record his thanks to Paul Hughes and Danyon Rey for preparation of the illustrations for this report, and to Ellen Macadam and Simon Townley for patiently reading the draft, and to each of the contributors. The cost of preparing this report was generously borne by English Heritage, Magdalen College and the W.A. Pantin Charitable Trust.

⁸ M. Rubin, op. cit. note 3, 289-99.



Fig. 2. The eastern suburb c. 13th century. The aqueduct from Crowell existed by 1246. The later aqueduct from above Holywell Mill replaced it in 1267.

DOCUMENTARY BACKGROUND

THE EASTERN SUBURB (Fig. 2)

Most of the medieval town of Oxford is covered by the documentary survey by H.E. Salter, but this does not extend to the suburbs in the east and west, where the absence of a clear sequence in the Hundred Rolls makes it much more difficult to assign documents to properties.⁹ So although Salter's own published version of the hospital cartulary contains deeds of most of the property in the east suburb as far as the Cherwell, we do not have the benefit of any sort of map to show how he believed them to fit together. Our best access to his ideas is through his commentaries on each charter group and the very fulsome preface to Volume III; the plan of properties around the hospital is based on a critical reading of his work (Fig. 2).¹⁰ Tenements are referred to in this report using a variant of Salter's notation for the charter groups in the printed cartulary. In the extramural part of the parish of St. Peter-in-the-East, tenements south of the main road include 2.1–2.11, those north of the road being 3.1–3.20.

A traveller leaving Oxford on the London road in the early 13th century would have passed through the east gate and out into East Bridge Street. On the left was the road to Holywell (now Longwall Street) passing by the earlier site of the hospital, close to the city wall opposite the east end of St. Peter's-in-the-East.¹¹ Much of the land in this area was the manor of Peter Boterel (3.1), extending north to the houses along Benseval Street, the old route to Kings Mill. The mill itself may at that time have been known as Holywell Mill or Headington Mill, or conceivably both because it was a double mill.

Returning to the main road, beyond Longwall Street there were fourteen tenements fronting onto East Bridge Street, perhaps closer to the main road than the modern building line which leaves the width of Gravel Walk in front (3.17–3.4). This frontage was totally rebuilt by the college around the 1480s and again in the last century. Beyond it was the second hospital. Salter showed that the garden site had been acquired by the Jews of Oxford for their burial ground (3.2). It was a roughly square plot, about the size of the medieval parts of Magdalen College. Salter recognised one tenement on the site of the college's gatchouse, but felt that there may have been others whose charters are no longer recognisable because the succession ended with the building of the hospital.

On the south side of the road was a lane leading to the barton of St. Frideswide, newly opened through an existing tenement, and now Rose Lane.¹² Beyond were ten further properties including Paris Mead to the south (2.1), and a plot measuring 300 ft. by 80 ft. whose history is bound up closely with that of the hospital (2.5). The alignment of the latter property was not defined by Salter, and the reason for its siting in Fig. 2 is discussed separately below (Discussion: Land Outside the East Gate).

All this property belonged to St. John's Hospital. Salter identified 211 charter groups, which could represent as much as one fifth of the 898 tenements in Oxford, so the hospital ranked as a major landowner within the town. In order to place its Oxford revenues in context, Julian Munby has reviewed the evidence for the non-Oxford property.

⁹ H.E. Salter, Survey of Oxford, i, ii, ed. W.A. Pantin, O.H.S. n.s. xiv, xx (1960, 1969).

¹⁰ CHStJB, i, 19-146; iii, pp. i-li.

¹¹ CHStJB, iii, p. xii.

¹² H.E. Salter, Survey of Oxford, i, 197 (SW 56).

THE PROPERTY OF THE HOSPITAL OF ST. JOHN, OXFORD by JULIAN MUNBY (Fig. 3)

Although the many and well-documented hospital properties in Oxford comprised a substantial part of its endowed income (despite the difficulties in collecting rent) there were also extensive estates outside the town, and those which survived in 1457 passed to Magdalen College on its foundation. In the absence of administrative records of the hospital estates, evidence for the properties outside Oxford has to be sought in a number of sources.¹³ The earliest is the 1246 royal charter of confirmation which recites earlier grants, to which can be added the Hundred Rolls of 1279 that contain extensive descriptions of Oxfordshire holdings.¹⁴ The hospital cartulary, dated about 1279, contains many deeds of rural properties; only that part referring to Oxford has been printed, but the remainder has been calendared and collated by Denholm-Young.¹⁵ The large collection of original deeds was calendared by Macray, and the individual estates are listed in Woolgar's *Catalogue of Estate Archives.*¹⁶ From these sources it has been possible to map all places where the Hospital held property at any time since its foundation (Fig. 3).

The holdings ranged from a few acres to substantial parts of manors, and extended from Dorchester to Banbury, with outliers in Buckinghamshire, Northamptonshire and Warwickshire, in Coventry, Bristol and London. There were several properties immediately east of Oxford, and the concentration of land in the middle Cherwell valley is interesting, as is the sole holding in north Berkshire (East Hanney, now in Oxon.). It is possible that the competing attractions of Abingdon, Eynsham and perhaps Bicester formed a distinct focus for charitable grants, but the extensive field of the hospital's influence is nevertheless remarkable.

As with the urban property, the years of active donation in the 13th century were not continued into the 14th; except where a series of local grants made a holding of some value, small properties may have been sold or exchanged, and many do not appear to have survived to be handed on to the college at its foundation. An unusually late grant was that of Horspath church by Henry VI in 1451, only a few years before the hospital was suppressed in 1457, but there is virtually no evidence for the later years of the hospital, and no survey of the lands passed to Magdalen College.

Harder still is any attempt to discover the annual rent income of the hospital, which in any case fluctuated according to what could be collected. This was not dissimilar from the experience of St. John's hospital in Cambridge,¹⁷ and was indeed the same with many of the secular colleges and their estates, which never managed to realise their full income from estates.¹⁸ The annual value of the hospital lands to the college at its foundation has been estimated at about £75 (about 13% of the initial income of the college).¹⁹ A general *valor* of the college estates in 1485/6 reveals hospital estates

¹⁴ Cal. Chart Rolls 1226-1257, 296-304; Rotuli Hundredorum (Rec. Comm. 1812-18), ii.

¹⁵ CHStJB; Magdalen Archives, MS. 92 (Cartulary); TS. Calendar of Medieval Deeds, Vols. I-II.

¹⁶ Magdalen Archives, Macray Calendar of Deeds; copy of Woolgar Catalogue also in the Bodleian Library.

¹⁸ See chapter on the college estates in J. Catto and R. Evans (eds.), The History of the University, ii, (forthcoming).

¹⁹ J. Mills, 'The Foundation, Endowment and Early Administration of Magdalen College, Oxford', unpublished D. Phil. thesis, Magdalen College Library MS. 635.

¹³ There are rentals and court rolls for Thornborough (Bucks.), and Westcote in Tysoe (Warks.); while the Oxford rentals of 1293–4 and 1302 contain some rural income; see C. Woolgar, *Catalogue of Estate Archives of St. Mary Magdalen College, Oxford* (1981). A list of the sources checked in the present work has been deposited in the archive room at Magdalen College, including a checklist of manors in the counties of Avon (1 manor); (old) Berks. (1); Bucks. (2–3); London (1); Northants. (1); Oxon. (52–65); Warks. (2–13); uncertain (3).

¹⁷ M. Rubin, op. cit. note 3.



Fig. 3. Properties of St. John's Hospital outside Oxford. (County boundary as post-1974).

bringing in over £87 a year (though this is neither complete, nor distinguishes any post-foundation additions). In Oxford the college had a theoretical rental of £72 but cleared only £17 (20% of the actual income); the Warwickshire estates brought in £37 clear, Thornborough (Bucks.) £10, Headington and South Newington £5–7 each; Bloxham, Garsington, Oddington and Wootton £1–2 each.²⁰ So even allowing for changes since the suppression of the hospital, it would appear that the theoretical income of the hospital was not inconsiderable, and despite the inability to realise its full potential, it must always have had a moderately comfortable income.

THE FIELD INVESTIGATIONS (Fig. 4)

In a time of financial stringency the prospect of a large excavation can be disconcerting to a landowner. The college, it must be said, behaved impeccably. When their architects and engineers gathered to inspect their own trial trenches, within an hour they were telephoning the OAU to say they were finding ancient leatherwork. A further trial trench was agreed, this time hand-dug to confirm the archaeological potential, and this only added to the mounting interest by exposing ashlar stonework of remarkable quality and of obscure purpose. Again there was pressure on the college to allow a full excavation, to include the entire area of the former bath-house, i.e. nearly half the ground plan of the proposed kitchen, and again the college was able to accommodate the proposal.

By this stage it was apparent that the work was going to make a substantial contribution to knowledge of the medieval hospital. The package agreed between English Heritage and the college therefore included proposals for work elsewhere in the kitchen yard, and a watching brief on the entire groundwork programme of the main building contract. Proposals for refurbishing the former kitchen and preparation rooms would affect the most conspicuous survival of the hospital period, and in due course a proposal was put to the college for a thorough archaeological survey of the structure of the buildings during conversion to a junior common room, which thus became the fourth and final stage of the fieldwork.

The following section is a highly abbreviated account of these investigations, intended to highlight the strategy as much as the discoveries, which can themselves be illustrated better in a historical narrative form (see Discussion and Conclusions below). All medieval deposits and most of the later ones are mentioned, but by no means all are illustrated on plan or section drawing because of the dissected nature of the site, and a mention in the text report is intended mainly as a reference to the archive of site records to be deposited with the Ashmolean Museum.

(*Orientations*: The college and hospital buildings are mostly orientated at about 45 degrees to north, and for the purposes of the field recording we followed the *RCHM* in adopting an arbitrary 'site north' which is in fact nearer true north east. This had the advantage that the hospital and college chapels could be referred to by their standard liturgical orientations, i.e. altar at the east end, and this convention is followed in the following report.)

²⁰ Magdalen Archives, Lib. Comp. I (LCE/1), ff. 78-89.





KITCHEN YARD EXCAVATIONS:

A. Trial Trenches

With the consent of the college a small area of the bath-house floor 1 m. square had been excavated archaeologically in advance of demolition, without encountering anything medieval (Trench I). Later the architect's trial hole (Trench II) showed that there was recent fill to a depth of 1.9 m. Ordinarily this would have been the end of the project, but by chance the engineer decided to go deeper to look for a firm subsoil, and in digging 0.3 m. into a sandy river bed, he brought out what appeared to be a late medieval turnshoe. In fact this proved to be part of a 17th-century welted shoe, but at the time it prompted a meeting between the Unit, the college and English Heritage to make arrangements for an archaeological trial trench.

The trial trench III was 2 m. \times 6.5 m., across the line of the demolished bath-house. It encountered the same fill L32, L33 as had been seen in the architect's hole, which proved to be the upper fill of the robber trench F35 of a major wall F39. The unrobbed courses of the wall had a chamfered plinth on its east face towards the river, and a vertical ashlar face on the landward side. Behind it, i.e. away from the river, was another ashlar face F41 and a flight of stone steps F131, forming what was initially identified as a 'watergate' in a yet earlier river front.

There were inconsistencies in this interpretation, however, notably the flooring of ashlar slabs F90 between the supposed two phases of river wall, but the quality of materials was enough to demand further investigation and, as it transpired, the trial trench had hit the most extraordinary and enigmatic part of the hospital structure, the steps into the water culvert.

Fortunately the trial trench also demonstrated medieval floors L34 and L34/1 which indicated the level at which hospital floors could be expected. These were also represented to the south, and meant that it was possible to define the areas of backfill, and excavate them mechanically to create Trench IV, the principal excavation area.

B. Trenches IV, V and VI: (Figs. 5, 6)

Rescue Excavation Stage A

Bulk excavation with a large digger and pneumatic drills removed the remains of the bath-house footings, modern pits, recent college floors and fill levels L1–3, F4, F31–33, L42–47, L51, L53, L65–67, L71, L72, L73, F92–93, L97. It was also possible to remove most of the robber trench fill F35 of the big Cherwell river wall, which must have been replaced by the existing boundary wall probably in the 17th or early 18th century. Between the two was extensive dumping of rubble L21–23, L36–37. There was also a robber trench F64 suggesting the renewal of a wall F57 on roughly the line of the present south wall at a similar date.

Inside the former furniture store the upper levels of Trench V were dug by hand from the top. Here Gerry Wait encountered a cobbled floor L501 and a partition wall F503, and various internal floors, successively L504, L506, L510–L512. They all scaled the partly robbed (F517) top of an east-west wall F505, and must be the internal floors of the building which first appears on Agas' map and survived until perhaps the early 19th century. There were signs that a privy existed on the Cherwell bank perhaps within this building, re-using the outfall of a side branch of the medieval culvert in the hospital infirmary F113, F118–F119, F173. Otherwise deposits of this time were seen in Trench V both north (L507, L508, L514) and south (L573, L521–524, L526–7) of the surviving infirmary wall 517, and also in Trench VI (L601/1, L602–L606, L607–L611). Floor layers L512 and L602 each produced unusual pottery assemblages (see below).

Rescue Excavation Stage B: Hospital Levels

By removing the bulk of the infill of robber trenches and the floors and yard surfaces of the college kitchen yard as described above, the top of the medieval building structure was exposed. It was in a highly dissected state — the stonework of the river wall F39 scarcely survived above water level, the internal floors of the hospital building were cut into small squares by the foundations and drains of the bath-house cubicles, and trenches to the west were restricted to small areas to avoid destabilising the remaining buildings. It promised to be very difficult to reconstruct a building from this sort of evidence, and it was also impossible to follow floor deposits from one cubicle to the next with any assurance.

The excavation strategy was therefore to concentrate on recording the columns of deposits left between the disturbances. In no square was it possible to distinguish floors which might relate to the use of the building after 1458, i.e. the college levels, and only where there were stone footings of the infirmary was it possible to make a distinction between the earlier hospital floors and the sandwich of construction levels and reclamation infill underneath (see below). With these provisos there follows a contracted account of the excavated deposits in the rescue trenches, working clockwise from Trench III to Trench VI.

Trench III showed the most useful detail of the internal floors, with stony gravel L34 overlying successively a floor L60, makeup L40 and a deeper floor L61. All these layers sealed the reddish loamy gravel L62/L167, L89, which was the bulk infilling of both culvert and stairwell (F90, F131). This identifies them all as floors in the later life of the infirmary, and it was interesting to see that they abutted the foundation stones of a partition F68, which may have been a barrier around the top of the stairwell, but which clearly survived its infilling, perhaps functioning as a partition like F53 to the south.

The north-west end of Trench IV included a series of infirmary floors around a column base F114 of the infirmary annexe. Layers L95–96, L98–102 and L105–106 were fragments of alternate sandy floors and thicker gravelly makeup layers. Beneath was a silty sand layer L103 with charcoal suggesting domestic activity, and which could be paralleled with similar layers L61, L107, L116, L139, L146–149 in other cubicles. They may indeed all belong to the horizon of L60–61 described above as overlying the culvert fill, which would here be represented by gravelly makeup L108, L117, L145, L155.

The domestic activity was not represented further south, where a wall F53 was flanked by gravel layers L54. It had a general resemblance to the 'partition' wall F68 beside the stair (see above), but was laid on a mortar floor L56 and was probably therefore not an original feature of the infirmary; its position suggested it was a partition wall running from pier F701 eastwards to join the outer wall above culvert arch F41/3.

At the south end of Trench IV there were no hospital floors surviving amongst the later disturbances, and similarly in Trench V where the comparable levels were found to contain 16th-century pottery down to the silty loam L525. The last of the 'rescue' Trenches, Trench VI, did however produce a useful sequence of internal floors L613 and L614, being grey and ashy with resemblance to the L103 series in Trench IV (see above). Beneath was a gravelly makeup layer L612–L616 paralleling L108 etc. elsewhere (see above).

This brief account therefore shows that it is practicable to link together the separate islands of deposits in the later life of the infirmary. The earlier floors, inasmuch as they could be distinguished from the complex building levels beneath them, tended to be cleaner, less ashy. They were exposed as mortar floors L123 in Trench IV and L617 in Trench VI, in each case with a gravelly makeup beneath (L124, L618, L618/1). Beneath was an earlier mortar floor horizon, L56, L75, L121-2, L126, L129, L152, L619-621. This perhaps represents the original surface within the infirmary, and was associated with the only upstanding structure, column base F114. Also to be noted at this stage were the lower silts L90/1, L168-9 of the culvert, which were presumably accumulated during its brief period of use.

Rescue Excavation Stage C - The Primary Structure of the Infirmary

As the internal floor deposits were being excavated, so the main structure of the infirmary was appearing. However it was only in the final stages of the investigation that the so-called 'natural' layers beneath the infirmary floors were recognized as man-made infill. This therefore made sense of the complex of laminated surfaces beneath the earlier mortar floors, i.e. L125, L127–8, L132–6, L138, L159, L160, L162, L166, L622, L624–5, L624–5, L627–8, which were often inseparable from the layers of gravel and other fill L79, L142–3, L163–5 beneath them. They began to be seen more clearly in the contractors' excavation (see below), when it became clear that the infilling had been done after the stone foundations were in place in every example where a relationship could be seen.

The stone structures against which this infill had been dumped included the culvert west wall F41, which was continuous with the associated steps F131 and the thickenings F70/1, F80, F133 behind the arch abutments. Its lowest course overlapped the slabs of the culvert floor F90, as did the culvert east wall, i.e. the inner ashlar lining of the river wall F39.

The culvert itself is described in more detail below, but it will be appropriate to mention other structures which appeared at this stage. The river wall showed signs of rubble repairs to its outer face, with the loss of long stretches of the chamfered plinth stones. There were also signs of repairs to the south wall near the culvert outfall, where an oblique rubble structure F172 was out of keeping with the overall symmetry of the building, and may have been a repair.

The Infirmary Culvert, F90 etc. (Fig. 17; Pl. 3)

The watercourse at St. John's Hospital included some of the best-quality medieval stone excavated in Oxford for many decades, and it deserves special mention. Reasons for its design and location are discussed below, and the following account tries to avoid prejudicing those arguments.

The stone was undoubtedly of high quality, and similarly the dressing of it, although in some cases the face was not strictly square. In construction the first job would have been to lay the rebated floor stones which were clearly designed to minimise leakage, but were thinner than the c. 0.15 m. of the drain slabs illustrated by Buckler outside the college north range.²¹ Their gradient was uneven, but averaged 1:100. Next presumably

²¹ CHSt/B, iii, pl. 1.



Fig. 5. The Kitchen Yard trenches II-VI and the salvage area trench VII: mainly medieval levels.



1 0 1 2 3 4 5 m.

Fig. 6. Kitchen Yard excavations. Above: Trenches II-III, E.-W. section across east end-wall of infirmary; below: Trenches V-VI, N.-S. section across S. wall of infirmary F544, with a pier base F623 of the heavier arcade.



Plate 1. High level view of Trench IV from north. At lower right note the base of arcade column F114, and stair F131 into culvert.



Plate 2. Trench V from south, showing external buttress of south wall F544 of infirmary (left), and blocking F535/1 of the second relieving arch.

came the first course of lining stones on each side, which were bedded on the gradient of the floor (rather than horizontally). There was no conspicuous change in mortar through the rubble core of the river wall F39, despite the appearance of straight joints, and it will be assumed that the whole wall together with its ashlars on both faces was raised at one time.

With the inner wall of the culvert the mason must have faced a dilemma, because it needed to be self-supporting until the core of the infirmary was infilled. This seems to have been solved by packing small rubble against the back face, and reinforcing this with larger stones at intervals to buttress the thrust of the small culvert arches. Each of these arches had been built on timber centering, the horizontals of which were cut into the fourth course of lining ashlars.

The elevation of the west side of the culvert is instructive for the way the lining ashlars are laid. Each stone of the second course overlaps the stone beneath it, leaving no 'straight joints'. The same is true of the third course, but when the fourth course was laid its mortar joints coincided with those beneath it in no less than eight places. These straight joints are carried further up into the fifth course in six places. In the seventh the stones are missing and only in one place is the joint bridged. It is interesting to find that of the six 'triple straight-joints' two and possibly a third coincide with the north side of culvert arch abutments, suggesting that the mason was using quoin stones to mark out the positions of the abutments at an early stage, and then infilling southwards to the next prepared position. They show that abutments F41/3, /4 and /5 were spaced at 2.9 m. intervals, which probably meant 9 ft. 6 in. to the mason. A fourth straight joint 9 ft. 6 ins. to the south probably therefore indicates the north side of the missing abutment 'F41/2'.

Each of the arch springings was c. 70 cm. wide, probably 2 ft. 3 ins. to the builder. If we therefore project the 9 ft. 6 ins. spacing one stage further south of the putative arch 'F41/2', we can conjecture that the last arch on the culvert was much thicker, 1.2 m. (4 ft.), as would be expected from its role in supporting the outside wall.



Plate 3. Southern outfall of the infirmary culvert, from south-east.

We then see that the remaining four straight joints each fall between 3 ft. and 3 ft. 6 ins. north of an arch abutment, and the corner of the access stair adds a fifth. There is therefore some sort of module. The culvert arches would make sense if they were supporting responds to the piers, or partition walls, but the blocks immediately north of them do not fit a symmetrical pattern. In one case it is clearly a stairwell, and in an attempt to explain the remainder the block north of F41/2 was completely dismantled at the end of the dig to make absolutely certain that it was not infilling a second stairwell. There was no structure behind it, and the explanation of these blocks is unresolved, but alternative suggestions are offered below in the discussion section.

Excavation Stage D - Watching Brief (Fig. 5)

By courtesy of the college's contractors Messrs E.W. Beard it was possible to observe as much of the ground disturbance as was practicable within the framework of the Unit's other activities. The proposed kitchen required a basement along its east side, and the college's engineer had chosen to use mass concrete footings elsewhere, all of which was likely to cause major disturbance to the medieval deposits. The areas shown open on Fig. 5 represent those excavations seen by the OAU, although they are not the full extent of ground disturbance.

The contractors tended to work erratically from the south-east corner round towards the gate. In the early stages there were fascinating details of the eastern annexe, such as the stone piles F703 beneath the south wall F70, linked by radial rubble arches seen in two places. This was in stark contrast to the north wall F704, which showed as a continuous stone construction like the river wall F39. Culvert F41 was seen to continue up to and through it, with one last arch abutment as expected, just north of the stair.

It had been anticipated that further column bases like F114 would be repeated opposite each culvert springer, but there was only one (F701), making an arcade of three equal bays running north-south along the river, and open on its west side into another building. A further revelation was the discovery of a layer of peat L702 at a level corresponding to the base of the river wall, and which was shown by pottery to be no earlier than c. 1150. This meant that the clean gravel above it must have been deposited subsequently, and it was

plain to see that it was man-made reclamation of part of the river-bed after the main foundations of the infirmary had been built. In retrospect it was therefore clear that the light-weight pier bases F114 and F701 were exactly in phase with the heavier base F623 to the west, and with the culvert and north wall too, because they all predated the gravel infill.

During the period 2–13 August the watching brief was taken over by George Lambrick. He was able to record parts of two more of the big pier bases F707 and F708 forming a four-bay arcade with F623, and a third to the west (F724), which for the first time began to suggest an east-west arcade between twin halls. There was even a suggestion that the pier F707 which was common to both heavy arcades was elongated E.-W. to take the thrust of the twin-hall arcade. Mr Lambrick identified the rebates of a north-east door leading out of the infirmary (F704/1) and the butt end of a wall F710, built of small rubble bonded with red-brown loam, which turned out to be the south end of the assumed warden's hall (see Survey below).

Daily observation of the contractors' work had therefore provided a sound basis of evidence for an east-west infirmary, with an arrangement of piers totally different from the eastern annexe. It was also clear that the internal deposits of the infirmary would be much better preserved here than in the annexe, and the observations can be most easily described by following round the contractors' trenches in sequence anticlockwise from the north east.

One of the contractors' foundation trenches showed the west face of a stone footing F705 just east of pier F708, partitioning off part of the annexe, and with a later stone structure at its south end where it joined the elongated pier base F707. Within this trench were 0.3 m. of mortar, gravel and loam floors, with no stratigraphic relationship to the masonry. Foundation trench A4–6 showed two partitions, F709 to the west having been robbed and being possibly earlier than F711 to the east. Again there was a 0.3 m. depth of internal deposits L714, which in this case appeared to change character roughly on the line where an east-west robber-trench F712 coincided with a change in character of F711, the impression being that the northern floors L713 were within a cubicle which had been modified.

Foundation trench A3 exposed an even thicker deposit of internal floors L715, 0.45 m. deep, including a shallow pit which formed one edge of a heavily burnt area F716, presumably the site of a hearth over a long period. Again there was much later disturbance which had destroyed the relationship of these floors to the twin-hall arcade base F724. A smaller trench A2 showed floors in all sections, some burnt *in situ*, others simply accumulations of ash. Further south again, Trench A1 showed the south wall of the infirmary F723 on a relieving arch as elsewhere (c.f. F544, F703). Its top here was faced with ashlar, there was a south return F722 and there were cobbles adjoining both, with clay pipes which suggest that the reworked infirmary wall survived into the 17th century. Finally the drain connection through the gateway was observed, but showed only the metalling of the post-medieval entry L725 and perhaps the line of the infirmary wall F723.

SURVEY OF THE OLD KITCHEN (Figs. 7-10)

In advance of the refurbishment of the old kitchen as a junior common room, the college had commissioned Robert Selwood to make a survey of the entire range of buildings east of the great hall, i.e. including the 'Oscar Wilde' rooms, the kitchen and the food preparation rooms. Mr Selwood very kindly returned to help with the investigation of parts of the building which had been inaccessible to him, particularly the roof structure. We are also grateful for the help and advice of John Ashdown, and to Julian Munby who kept an oversight of the recording work.

The college muniments include several 19th-century plans of the buildings, prepared in advance of proposed alterations in 1848 and 1880–81, and we are grateful for the assistance of Mrs J. Cottis (archivist) and Alan Mount (Clerk of Works) for providing copies of these.

Architectural background

A medieval building east of the great hall was taken down in the first half of the 17th century to make way for a new four-storey block for Gentleman Commoners built in 1635. It is typical of new accommodation which was being provided elsewhere in the

university at this time, some of which appears to have been speculative development by college servants.²² It accords with the appearance of a building on Loggan's map of 1675 not present on Agas' map in 1578. The ground floor of this building adjoining the hall was perhaps the buttery cellar, later provided with a brick vault, and access to the upper rooms was by way of a stair rising from the present kitchen lobby on the north side.²³ This was changed after two alternative schemes had been considered by the college in 1881, and the narrow passage linking the kitchen lobby to the kitchen yard came into being for the first time.²⁴

The medieval buildings east of the hall referred to above are seen dimly on Agas' map. The kitchen building itself does not appear to be there however, although it is clearly present a century later on Loggan's map. Here it is shown in two sections, and the northern section which extends as far north as the through passage in the east cloister range is presumably the Divinity Reader's lodgings which were replaced by the so-called 'West's building' in 1783, an elaborate Gothic latrine. Interestingly one can almost plot the shape of a continuation of this range on Agas' map, which would take it the full length of the east side of the cloister at the same distinctive skew angle. By 1750 Isaac Taylor shows much the same as Loggan, but with a small courtyard appearing at the south end, apparently where the surviving fragment stands. A further century later Hoggar's map of 1850 confirms the 1848 map of the college, showing the medieval buildings as they now stand.²⁵

What are we to make of this topographical evidence? The absence of the surviving building on Agas' map is surprising but not in itself a conclusive argument against continuity of use of the building. The open space on Taylor's map is much more worrying, but in view of the clear structural evidence of continuity of use this must result from difficulties in visualising the tight complex of buildings.

The Survey

Given the above background knowledge, the objectives of the archaeological survey were:

- 1. to investigate the form and date of the present roof;
- 2. to discover the nature and extent of the medieval building;
- 3. to record details uncovered in the kitchen fireplaces;
- 4. to record any alterations in the 17th-century building to the south.

The Roof (Figs. 7, 19, Pl. 4, 5)

The surviving parts of the roof include three trusses and part of a fourth, each with queen struts supporting collars and a crown strut supporting an upper collar. It was surveyed by John Steane in 1982.²⁶ For the present survey Robert Selwood's drawing was taken as the base, and augmented with details of the jointing etc. which had previously been inaccessible. The trusses were numbered 1–4, working south from the fragments surviving in the north gable.

²² J. Newman, 'New Building and Adaptation', in J. McConica (ed.), History of the University of Oxford, iii, (1986), 623-4.

²³ J. King plan of 1848: Bodl. MS. Top Oxon/a/23 (R).

²⁴ Magdalen College plans 1881.

²⁵ J. King plan of 1848: Bodl. MS. Top. Oxon/a/23/ (R),

26 J. Steane, op. cit. note 6, 78-9.



Fig. 7. Old Kitchen Survey: Composite section of the medieval range, including Truss 3, illustrating the hospital window openings and the refenestration of the E. Window. Based on R. Selwood survey.



Plate 4. Kitchen roof, W. end of Truss 3, showing the principal and three common rafters exposed above the upper purlin.



Plate 5. W. end of Truss 2, showing iron strap repairing the lower collar and opening cut through the lower collar, with king-post missing.

A small area of plaster ceiling was removed above the west upper purlin north of Truss 3. This confirmed that the principal rafter continued up to the ridge in a diminished form, now hidden beneath the plaster. The purlin was clasped by the upper collar which was itself secured to the rafter by an (angled) tenon and single peg. The purlin showed a simple splayed scarf joint with two pegs, as elsewhere in the roof. The wind-brace was let into the purlin with an unsplayed notch and fixed with a single iron nail. The common rafters were at 0.44 m, to 0.53 m, centres.

There was nothing to support the RCHM's suggestion that the queen struts were later insertions, although in Truss 2 the collars had been altered as if there had been an attic room here at some stage. The north ends of both trusses 3 and 4 had been cut away, apparently to accommodate the buttery, and the principal rafters are now supported on short ashlar posts rising from a substantial replacement wall-plate.

This is clearly only part of a roof which was originally longer; at the south end the purlins rest on corbels on either the south chimney stack (1018) or the wall adjoining, which are shown below to be later additions. At the north end there is a scarf joint in the lower west purlin tight up against Truss 1, which must indicate that there was originally at least one more bay to the north.

Tree ring dating

In order to satisfy interest in the date of the roof a series of tree-ring cores were taken by David Haddon Reece and Dan Miles of the Ancient Monuments Laboratory of English Heritage. One from the east purlin north of Truss 3 did not give a clear match with the available curves. However the lower collar of Truss 3 gave a date of 1417 for the last heartwood ring, with 11 sapwood rings, and the tie beam showed heartwood rings in a range 1368–1462, again without sapwood. Mr Miles suggests that after allowance for the missing sapwood, a date after 1475 would be acceptable for the tie beam, which fits very well with the main college building campaign of 1474–80.²⁷

The Walls and Below-ground Archaeology (Figs. 7-9; Pl. 6-8)

The college's contractor for the groundwork was again Messrs E.W. Beard, for whose cooperation we are very grateful. Their method of operation was to break up the floors and store the hardcore, reduce the level beneath and refill with the core. This meant the destruction of any archaeological deposit in the top 0.9 m., hence the need for a watching brief. The on-site observations followed the progress of the contractor's work, and for ease of comprehension the results are reorganised here in a historical sequence.

Careful analysis of the inside face of the east wall of the medieval kitchen after plaster stripping showed that there was a matrix of small rubble set in a red earth which survived everywhere not disturbed by later features such as doorways, a fireplace (F1006) or areas of repair. This fabric was identical to the butt end of this building as seen in the excavation watching brief (see above, Excavation Stage D, F710), and it was clear that the original medieval structure would be distinctive.

Further plaster stripping of the east wall revealed ashlar quoins of the rere-arches of two window openings F1007 and 1008, heavily disturbed by the Victorian windows, but providing an indication of the medieval bay-spacing. Ordinarily these features would only have been seen in elevation, but by chance a new doorway opening coincided with F1007 and made it possible to study it in section. This showed the remains of a central multion with hollow chamfers, rising from a sill 1.75 m. above datum (OD 57.32 m.), all within the recess of the ashlar window splay. The wall immediately below this sill, so different from the red-earth hospital walling, the new mouldings which match the early college windows, and the sill level of around 0.75 m. above that of the rise in ground level associated with the college phase everywhere on the site.

Elevation drawings were made of the stripped areas of both east and west inside elevations, including in the west wall a third window arch F1020 surviving to its full height and with much of the head reconstructable. It was becoming clear that we were seeing the remains of a substantial hall or ground-floor chamber of the hospital period. A chamfered quoin low down in the south-west corner of the kitchen prompted an investigation of the external face in the kitchen passage, where the head of an elaborate doorway F1012 was found just above modern floor level (see below). The wall south of this was inspected wherever there was any new exposure, but there was no sign of a further medieval window opening.

²⁷ The dates and t values are quoted in D. Haddon Reece et al, 'Tree ring dates from the A.M. Laboratory', *Vernacular Architecture*, 20 (1989), 47.



Plate 6. Three-centred stone arch of the south fireplace from N. during building operations.



Plate 7. Elevation of kitchen west wall showing ashlars of S. jamb and part of arch of hospital hall window.

The Medieval Doorway (F1012, Figs. 9, 10; Pl. 9)

The college's engineers were prepared to allow part of the stone blocking to be removed from the outer elevation of the medieval doorway to investigate and record the mouldings. Since the south jamb had survived better from the cutting back of the outer mouldings, it was this side which was chosen to be more completely exposed. Danyon Rey recorded elevations and sections, and noted the contrast between the two capitals. The college decided that the more complete south side should remain exposed in a reveal which would be covered with clear plastic when the remainder was panelled, and it was therefore available to be inspected by R.K. Morris who has recorded it as No. 901 in the University of Warwick Mouldings Archive. Dr Morris writes that he has:

little doubt that the doorway lies in the date-range 1220–60 and most probably c. 1230–50. Most distinctive is the type of roll-and-fillet of the arch, beaked only on one side. This feature is typical of the above period, mainly in provincial works in the south of England: examples are rare after 1260, and then usually combined with more elaborate filleted mouldings as found for instance in the north transept of Hereford Cathedral, c. 1260–80. Other good examples of the period include St. Frideswide's at Oxford (Lady Chapel, c. 1230); the choir arcades of Pershore Abbey (by the same workshop as St. Frideswide's); Ely cathedral, Bishop Northwold's work on the east arm 1234–52; Glastonbury Abbey, the Galilee doors, c. 1230 (?); St. Albans Abbey, the west front N.W. porch; Worcester Cathedral choir 1224–1235/40. Of these, the examples at Ely, Glastonbury and Worcester are close to the Magdalen college example in style, combining the beaked roll-and-fillet with keel mouldings as in the Magdalen arch; and significantly, Ely and Worcester are firmly dated.

The mouldings on the upper part of the south capital, as far as they are recoverable, resemble monolithic limestone capitals (i.e. capitals not employing a Purbeck marble abacus) as found for example at Worcester choir, Pershore choir, both firmly dated as above, and in the undercroft of Wells Cathedral chapter house (c. 1240–60?). The nailhead ornament on the Magdalen capital is also typical of this period: a well-dated example used in a similar context is in the nave arcades at Ketton church (Northants), which are usually associated with a document of 1232 implying that work was in progress at that time, confirmed by the consecration date of 1240.

The lower parts of the capitals on both sides of the doorway seem to be shaped to take paired detached shafts, of which one survives on the south side. I have however been unable to find a parallel for the complex moulding on the south jamb of the doorway, which would seem superfluous if it was intended to be concealed behind a second detached shaft. Nevertheless the evidence that the surviving shaft had been fixed at the top with lead, and the 'blob' of lead in a mortar joint of the jamb behind the putative second shaft where it could have had a steadying function, tend to suggest that there was a second shaft.

The function of the doorway is an interesting question: the quality of mouldings and the use of detached shafts are both superior features and suggest a major door, such as the entrance to a hall. Since it has the remains of a solid relieving arch it is likely to be *in situ* rather than having been moved here at a later date, so it implies that the building was important to the hospital, perhaps a hall.

On the question of the use of lead in this doorway, the writer is grateful to Jennifer Alexander for advice. She describes how lead is used for a variety of different joints in stone construction, most commonly on the joints between capitals and endelit shafts where the capitals have been built in with the structure (as in a wall arcade). It is also used where the shafts have been introduced subsequently after the settlement of the building to avoid problems of buckling, but at Magdalen there must be a good chance that this is a repair, because the edges of the stones are abraded and the lead forms an irregular frill round the joint.

Use of lead further down a shaft, as seems to be implied by the 'blob' at Magdalen, can be for two reasons: firstly for a repair after a decayed shaft has been sawn off below



Fig. 8. Old Kitchen Survey: Elevations of east wall, illustrating the surviving ashlars of hospital windows F1007 and 1008, with a reconstructed section through the cupboard F1017 and corridors behind Stack F1018. Inset at right: Elevation of rere-arch window F1020 in opposing wall. Based on R. Selwood survey.



Plate 8. Internal elevation of E. wall kitchen showing ashlars of hospital hall windows in stripped surface, one being cut by new square-headed doorway (centre). A blocked fireplace of post-1635 kitchen shows at right.



Fig. 9. Old Kitchen Survey: plan of the salvage excavations, based on R. Selwood survey. Note the limited survival of 13th-century fabric.

the capital; secondly for a shaft made up originally of more than one length. In the latter case, modern masons prefer to make the mid-shaft joint with the shaft erected, rather than try to hoist it complete, which can be unwieldy. The shaft can then be rotated to conceal the pouring hole of the mid-shaft joint, before the top joint is poured to fix it permanently. Of the two, the repair of a shaft is the more likely to spill lead onto the wall behind, but any resulting 'blob' is unlikely to remain if the shaft is removed, even if it is in a slight ledge. At Magdalen the lead seems to be inserted in a bedding joint between two blocks of the jamb, and in this case it is much more likely that it was the attachment for a spacer which helped to support a shaft made up of jointed lengths from the start. Such spacers are used on shafts in the clerestory of the Angel choir at Lincoln Cathedral.

Dr Morris's and Mrs Alexander's comments seem to confirm that the doorway belongs to the early years of the hospital foundation, and that its 'superior features' were subject to considerable wear and tear. Discussion of its place in the overall development is reserved for the historical section below (see The Hospital Hall).

Below-ground Deposits in the Kitchens (Fig. 9)

The contractor was steadily turning over the below-ground deposits, but fortunately not deep enough to affect hospital floors which, as projected from sightings in the kitchen yard, would have been at a depth of about 1.4 m. Everything seen in the kitchen must therefore have been material either dumped to raise the ground level for the college, or subsequent accumulations. Within the main kitchen this included a well F1010, with the floor of a stone drain F1009 curving away from it. To the south was a partition wall F1001 built of massive stone blocks, with a small fireplace F1003 and perhaps the breast wall of a larger chimney stack F1002 on its south side, both facing the existing south fireplace of the kitchen. The digger driver reported what might have been an eastern breast wall, corresponding to F1002, close to the east wall of the kitchen.

There was some evidence to show the sequence of fireplaces here. The hearth level of fireplace F1006 was well above the hearth and floors associated with the partition wall F1001, and its position shows that it could only have been built after the partition had been removed. Similarly the existing southern fireplace F1018 had a foundation offset very close to modern floor level, which in the circumstances must mean that it was also later than F1001. This immediately begins to confirm that the existing kitchen fireplaces were later additions, and suggests that the early college kitchen might have been in this partitioned-off south section of the hospital range immediately east of the new hall.

There was a suggestion of another partition within the building, a line of similarly massive stones F1011 beneath the north fireplace F1019, which stood on a footing of small stones in red earth F1011/2 and might have been a stage in the development of the northern end of the college building. Inspection of the interior of the existing north wall showed a window at a high level, but nothing resembling the three modern blocked lancets on the exterior face which the RCHM assumed had been restoration of late 13th- or 14th-century openings; the Clerk of Works showed a drawing relating to the most recent refacing of this wall which showed that there had been no ancient features in it.

In the preparation rooms to the east of the kitchen the floor clearance and plaster stripping showed the outside of the hospital building, but the whole wall had been refaced in brick in the 1880s alterations. Across the floor the stone footings F1013 and F1014 of the walls shown on the 1848 drawing were detectable, and one of the ovolo-moulded windows survived in its original position in the river wall, the remainder having been reset in brickwork of the 1880s.

To the south the pastry kitchen floor received the same treatment as elsewhere, and showed the footing of a north-south partition F1015 in bond with the south footing of the 1635 building. Drainage trenches here went deeper than anywhere else, and exposed ashy, gravelly and mortar levels L1016 from 0.81 m. down to 1.35 m. (OD 56.05), some of which may have been floors of the hospital period.

On the north side of the pastry kitchen was a cupboard F1017 with a round head carrying the weight of the main north wall of the 1635 building, and with a false back F1017/1 0.4 m. in front of the original. The cupboard backed onto the back of the south kitchen fireplace with a 0.4 m. void between the two, which by 1848 had already been blocked off with an oblique wall at the east end. It initially seemed possible that the cupboard had been pushed back to utilise the space of a passage between the kitchen stack and the 1635 building (as exists on the first floor), but the survival of the hospital doorway F1012 shows that there could



Fig. 10. Old Kitchen Survey: Doorway F1012, reconstructed elevation and sections. The lead plug is visible just above infill level on S. jamb.



Plate 9. Detail of doorway of hospital 'hall' as exposed in kitchen passage.

never have been access to such a passage from the west, and it must be assumed that this was simply a void created by the need for a corridor at first floor level to reach the various rooms. The void would have helped to insulate the cupboard from the heat of the stack.

The Kitchen Survey: Discussion of the College Phases

The survey has corrected several misunderstandings about the college's oldest building: the kitchen roof clearly belongs to the college period, and it had been added to a building which was almost certainly not a kitchen in its original form. Enough survives of the early fabric and original features of the hospital building to make a case for a large spacious hall, and the way it is shown on the 16th- and 17th-century maps makes it look like the survivor of a medieval riverside range extending along the whole of the east side of a large hospital courtyard.

Further analysis of the hospital phase is reserved for the general discussion below, and the following comments relate to the later use of the building. Immediately after the founding of the college in 1457 the range was presumably still as it had been during the life of the hospital, until the time of the main rebuilding campaign of 1474–80 when it was reroofed. This was perhaps when it was fully refurbished, with new windows in the existing splays (e.g. F1007) to bring it up to the college standard. Was it also at this time that the south part of the range was partitioned off to make a college kitchen directly adjoining the east end of the new great hall? The evidence is circumstantial: the remarkable but very real curve in the line of the partition wall F1001 suggests that its west end was meant to take the thrust of the north wall of the hall, but then to curve back

to admit at least a proportion of the light from a newly refenestrated window (F1007), even though part of the window splay had to be blocked. This partition has the remains of fireplaces at a low floor level on its south, which could have been part of the kitchen. Certainly the newly-built college needed a kitchen close to this end of the hall, and it is fair to visualise the new partition as the north side of the first college kitchen, re-using the southernmost three bays of the old hospital hall. Some of the ashy floors seen against the south wall may therefore also have belonged to this early kitchen (L1016).

The rest of the medieval range may at this stage have had attic rooms inserted, as shown by the alteration to Truss 2 (Pl. 5). But this arrangement had almost certainly been reversed by the 1630s, with the existing south kitchen chimney facing onto what was broadly the kitchen we now see. Thereafter the upstairs rooms are at the south end of the range, with the ground floor being used for food preparation and communicating with the buttery to the west.

How did this change come about? The survey illustrated the sequence of events relating to a blocked fireplace in the east wall (F1006, Fig. 8), which could only have been installed after the partition wall forming the north side of the early kitchen had been removed (F1001). This would fit as part of a major remodelling of the range in 1635 to create space for new rooms for gentleman commoners as described above, for which the college may have been prepared to move its kitchen northwards. If so we should be looking for evidence that the present two great fireplaces could both be of this date. Certainly the south fireplace with the curious void behind it can best be explained as having been built just far enough away from the 1635 building to accommodate the present corridor at first floor level, which provides a necessary link between the rooms and the kitchen stair. This suggests that the stack and the rooms were planned as one. and the arch of the south fireplace might well be 17th-century (RCHM describes it as '3-centred' rather than elyptical, but either might fit the date in Oxford). The large cambered oak lintel of the north fireplace could be explained as a repair of a similar stone arch, or it may have been built this way simply because a suitable cambered timber was available.

So it is possible to visualise the main kitchen as having taken its present form by the mid-17th century. It included a well on the river side (F1010) and a stone drain leading out of the same side, presumably opening into the Cherwell before the 18th-century preparation rooms were added. It is possible that during this period the main source of daylight was still through the splays of the old hospital windows (F1007–8). To the south it is likely that the ground floor of the commoners building was already the pastry kitchen. *RCHM* noted a 'cupboard' with a four-centred doorway in the north wall, which is now seen to be part of an oblique passage behind the stack which had been blocked by 1848 and has now been reopened by Maguire and Murray. Was this area a lobby with a small stair beside the stack? It could have led up to the corridor on the first floor, and might explain the arrangement of doorways between the kitchens, but no evidence survived in 1988 and there will be even less now.

To attempt an interpretation of the 18th- and 19th-century kitchen arrangements from archaeology alone would probably be very naive. It is therefore proposed to consign the evidence to an archive in the hope that a culinary historian will be able to interpret the detail in the light of the present general conclusions. It seems then that the east range of the medieval hospital has now survived three great reorganisations. The first was in the late 1470s when its south end was made into a kitchen, acting as a structural and functional extension of the new great hall, which left the northern part of the range for rooms. Around 1635 the kitchen was moved bodily northwards along the old range, and for the first time since the 13th century a new structure was built, providing kitchen

facilities at ground floor level with rooms above. This arrangement was certainly modified and extended in the following three and a half centuries, but the third great reorganisation is what we have just witnessed, the kitchen having leapfrogged southwards to the old yard area, and the medieval building having been converted to a more recreational function.

THE FINDS

As would be expected with a deeply stratified site dug in small areas, the finds are limited in number and spread over a wide range of deposits. For ease of presentation each category is described under the arbitrary framework of development 'phases', which reflect changes occurring in the east end of the infirmary. Finds from the hospital phases were given priority over those from the later period at the instigation of English Heritage, but there are very important pottery assemblages of the 16th–17th centuries, etc.

The development phases are as follows:

Phase 1	to AD 1231: Pre-hospital
Phase 2	c. 1230s: Construction of the Infirmary
Phase 3a	1230s to 1260s: Early Infirmary
Phase 3b	c. 1260s to 1474: Later Infirmary
Phase 4	1474 to early 19th century: college buildings
Phase 5	Modern

THE POTTERY by MAUREEN MELLOR (Figs. 11–13)

The pottery from these two important institutions revealed valuable detail about this corner of Oxford.

Some 752 sherds were associated with the excavation. 70% was associated with the college buildings of post-AD 1474 (Phase 4), but following the priorities of the funding body only two assemblages are discussed in this paper. 3% was associated with the pre-hospital build-up (Phases 1 and 2) while 28% was contemporary with the life of the hospital (Phases 3a and 3b).

Pottery from the Pre-hospital Dumping

The earliest levels contained material brought from elsewhere for raising the ground level. Apart from a residual Romano-British and an early Saxon sherd they contained early coarsewares and finewares from the vicinity of Brill/Boarstall in Buckinghamshire (Group III AW1 and AW2) (see Appendix for petrology report). Pottery from an area to the south-west of Oxford (Fabric AG, Group III) was also present.

The assemblages from Phases 1 and 2 were of very similar date, and surprisingly they included no Oxford Early Medieval Ware (Fabric AC, Group IB) as might be expected in an assemblage of the first half of the 13th century.²⁸ This may mean that the makeup material was contemporary rubbish, and therefore did not include the residual early finds which one would expect of soil dug out of the built-up areas in the town. If, as seems likely, the infirmary was one of the first buildings at the time of the hospital's foundation on this site in 1231, then this is the earliest occurrence of material of the Brill tradition. The previous earliest sealed group was from makeup beneath a domestic building at the Oxford Blackfriars, dated to c. AD 1250.²⁹

²⁸ M. Mellor in G. Lambrick, 'Further Excavations on the Dominican Priory, Oxford', Oxoniensia, 1 (1985), 175, Table 1, Phase 1.

²⁹ Ibid. 177.

Pottery from the Hospital Levels (Phases 3a and 3b, Fig. 11)

The levels contemporary with the hospital contained domestic and tablewares from East Wiltshire (Group II Fabric AQ). 'Cooking pots' of this type have been found in garderobe assemblages at Witney Palace³⁰ and Netherton, Hampshire,³¹ and it may be that in this context they were not used as containers for food. Smaller 'cooking pots', a double-shelled lamp and a variety of jugs were found downstream from the infilled culvert, suggesting perhaps that they broke while being filled with water at the steps, and this may help explain the purpose of the water supply. Some highly decorated fragments were found, while others were not well executed, such as a small baluster-type with applied white strips with alternating red slip and mottled green glaze,³² and plainer jugs with mottled green and a thin layer of green glaze (Fig. 11, Nos. 2, 3). By comparison with other assemblages from Oxford they would be consistent with a date in the second half of the 13th century.

This ceramic trend continued into Phase 3b, but with jugs and pitchers becoming more popular; again a double-shelled lamp was present together with a bottle.

These assemblages were typical of the pottery found in domestic tenements in Oxford,³³ except that a wider variety of production centres might have been expected. There was no evidence of smaller vessels such as bowls or bottles which might have been used as containers in an infirmary, either for medicines or as bleeding bowls. Nor were there any residues in the jugs to suggest that the contents had been heated, or evidence of urine encrustation.

Pottery from the Early College Levels (Phase 4, Figs. 12, 13)

The destruction phase of the infirmary produced 529 sherds comprising pottery of the 16th and 17th centuries, the dating of the 17th-century assemblages being confirmed by the clay pipe evidence (see below).

There are few published groups of pottery from Oxford dating to the first half of the 17th century, and even the major excavations from St. Ebbes produced little of this date.³⁴ A short note on the city ditch excavations for the Bodleian Tunnel does not do justice to the finds from the site.³⁵ The material is available for study in the Ashmolean Museum, however, and it included 'bellarmines and other stonewares, jugs, mugs, pipkins, pancheon dishes, household crockery of all kinds, with black, yellow and green glaze; drug-pots in Lambeth and Bristol Delft, besides a few fragments of imported Italian wares'. The ditch was probably filled in at the slighting of the Royalist defences in 1651, and the material is very similar to some of the assemblages from Magdalen College.³⁶

Two assemblages are illustrated. The first, F602, with no clay pipes, was interesting because it was dominated by local earthenwares from Brill, with jars, jugs with a splash of mottled green glaze on the belly (Fig. 12, No. 1), and thistle-shaped cups, some glazed light green or black (Fig. 12, Nos. 4 and 3, the latter with thick encrustation internally and light green glaze). These local wares were supplemented by: a South Netherlands jug (Fig. 12, No. 8) with 'HBS' hand painted in blue, the abbreviation of the name Jesus in Greek;³⁷ another probable South Netherlands jar (Fig. 12, No. 9) perhaps with the same inscription in blue; a large sherd from a costrel of Merida type ware (Fig. 12, No. 5) made either in Portugal or Western Spain;³⁸ and

³⁰ B. Durham, T. Allen, 'Excavations at Mount House, Witney', in preparation, typescript at Oxford Archaeological Unit.

³¹ J. Fairbrother, Faccombe Netherton: Archaeological and Historical Research, unpublished M. Phil. thesis, University of Southampton.

³² B. Durham, 'Thames Crossing at Oxford', Oxoniensia, xlix (1984), Fig. 7 No. 14, 68-71.

³³ B. Durham, 'Archaeological Investigations in St. Aldates', Oxoniensia, xlii (1977), Phase 8, 134; M. Mellor in N. Palmer, 'Medieval Tenements in the Hamel, Oxford', Oxoniensia, xlv, (1980), Figs. 8, 11-13.

³⁴ T.G. Hassall, C.E. Halpin and M. Mellor, 'Excavations in St. Ebbes, Oxford, Part II', Oxoniensia, xlix (1984), Figs. 13, 16-17, 187.

³⁵ E.T. Leeds, in J. Daniel, 'The City Ditch', Oxoniensia, iv (1939), 159-60; B. Durham et al, 'Northern Defences of Oxford', Oxoniensia, xlviii (1983), 31-2, 36-7, 39-40.

³⁶ M. Mellor in B. Durham et al, op. cit. note 35, 30-2.

³⁷ I am very grateful to John Ashdown for introducing me to Hall's Dictionary of Subjects and Symbols in Art.

³⁸ J.G. Hurst et al, 'Pottery Produced and Traded in North-West Europe, 1350-1650', Rotterdam Papers, vi (1986), Figs. 31, 69.



Fig. 11. Medieval jugs and floor tiles from the infirmary: 1. P/89/0/1 AW; 2. P168/0/1 AW; 3. P89/0/2 AM; floor tiles: 4. T521/0/1 IV; 5. T519/0/1 IIIB. Scale 4.

a small whiteware strap handle (Fig. 12, No. 10) with pierced diamond pattern along the centre and mottled green glaze, which is unparalleled from recent excavations from the city of Oxford, and John Hurst was unable to identify the source. A large storage jar with a distinctive bifid rim (Fig. 12, Nos. 6, 7) cannot be paralleled with Brill jars of this period, and a source in the Midlands should be sought. The base of a salt in red earthenware, thumbed around the base, and glazed orange (Fig. 12, No. 2) is probably not local. No Surrey whitewares nor Rhenish stonewares were present and the date of this assemblage is likely to rest in the first half of the 16th century.

The second of the selected assemblages, F512, was dominated by Frechen type stonewares, followed by tinglazed earthenwares; only two sherds of Surrey whiteware and red earthenware were found. The Rhenish stonewares were mainly globular tankards (Fig. 13, Nos. 11–14, 22) with a variety of impressed decorations on the rim (Fig. 13, Nos. 1–9) and fake medallions (Fig. 13, Nos. 15–19); only one drinking jug³⁹ and one fragment of bellarmine were noted. No. 11 had a cap hole at the top of the rod handle. Tinglaze earthenwares included

³⁹ Hassall et al, op. cit. note 34, Fig. No. 6, in fiche.



Fig. 12. Early post-medieval pottery (Phase 4): 1. P602/0/1 BX; 2. P602/0/2 REW; 3. P602/0/3 BX; 4. P602/0/4 BX; 5. P602/0/5 MER; 6. P602/0/6 ZZ; 7. P602/0/7 ZZ; 8. P602 and 604/0/8 TN; 9. P604/0/9 TN; 10. P602/0/10 ZZ; 11. PU/S/1 WHW; 12. P603/0/1 RST; 13. P603/0/2 RST; 14. P603/0/3 RST. Scale 4.



Fig. 13. Early post-medieval pottery and clay pipes (Phase 4): 1. P512/0/3 RST; 2. P512/0/4 RST; 3. P512/0/5 RST; 4. P512/0/6 RST; 5. P66/0/1 RST; 6. P512/0/7 RST; 7. P512/0/8 RST; 8. P512/0/9 RST; 9. P512/0/10 RST; 10. P512/0/1 TN; 11. P512/0/2 RST; 12. P512/0/11 RST; 13. P512/0/12 RST; 14. P512/0/13 RST; 15. P512/0/14 RST; 16. P512/0/15 RST; 17. P512/0/16 RST; 18. P512/0/17 RST; 19. P512/0/18 RST; 20. P512/0/19 RST; 21. P512/0/20 TN; 22. P512/0/21 RST; 23. P512/0/23 PP; 24. P512/0/24 PP. Scale Nos. 1-22 :‡; Nos. 23-4: 1:1.

cups, glazed white internally and externally (Fig. 13, Nos. 20–21) and a drug jar, hand-painted in blue and manganese purple (Fig. 13, No. 10) for the storage of dry stuffs.⁴⁰ The two clay pipes were of the range c. AD 1630–1655, and an early to mid 17th-century date seems likely, perhaps around the time of the building of the Gentleman Commoners' rooms nearby. This assemblage would seem not to be a domestic culinary assemblage but one associated with drinking – the social rather than the mundane life of the college.

Other fragments of intrinsic interest included an unstratified Surrey whiteware costrel, glazed mottled green; a naturalistic beard from an early bellarmine (Fig. 12, No. 12); and a Rhenish stoneware drinking vessel of a type not paralleled from local excavations (Fig. 12, Nos. 13, 14) dating to the first half of the 17th century.

The early post-medieval ceramic assemblages from Magdalen show considerable contrasts with those assemblages from tenement sites excavated by the Unit in the south-west of the city,⁴¹ and future work from college sites for this period would probably continue to highlight valuable detail and strong social variations.

Appendix: Petrology of New Fabric-types

OAU has made a practice of updating the corpus of fabric types which were originally published in 1977, and qualified in 1980.⁴² The present site includes examples of the two variants of Oxford Fabric AW as distinguished petrologically by Alan Vince, which can be recognised visually as follows:

Fabric AW1: Medieval Coarseware

Sub-angular quartz up to 0.8 mm., ill-sorted, sparse rounded quartz. Clay matrix: fine clay pellets, some coating, laminated.

Fabric AW2: Medieval Fineware

Abundant sub-angular quartz up to 1 mm., sparse rounded quartz up to 0.6 mm., iron coating, sparse red iron ore. Fine clay pellets.

COIN FINDS by NICHOLAS MAYHEW

- Very worn fragment, possibly showing [] DG [] NR. Probably a half groat of Elizabeth or Mary, 1553-1603. If so the period of use would extend to the end of the 17th century, but less likely after 1650 (SF40, L512, Ph 4).
- Two 15th-century jettons, one of Burgundian type, the other of French type⁴³ (Both SF 612, L604, Ph4).
- James I Lennox Farthing, 1614–1625, possibly in use to 1644, very corroded, identified from X-ray (SF 38A, L37, Ph 4).

THE METAL FINDS by NICOLA ROGERS (Figs. 14-15)

This report concentrates on the finds associated with recognisable structures, which on this site means the medieval hospital (Phases 3a and 3b). All iron objects apart from nails were X-rayed, and similarly those copper alloy objects which were heavily corroded. Many of the copper alloy finds had been cleaned and conserved, but none of the ironwork, and the identifications are therefore only provisional.

The writer is grateful to Dave Hooley and Arthur MacGregor for their assistance with this report.

Ironwork (Fig. 14)

- 1. Strap-hinge fragment, perforated at one end (SF36, L75, Ph3a).
- 2. 18 fragments, possibly from a barrel padlock spring (SF56, L89, Ph3a).
- 3. Strap-handle or binding, thick, slightly curved with two perforations at each end (SF35, L60, Ph3b).
- 4. Sheet fragment, square, perforated at each end (SF47, L116, Ph3b).
- 5. Hinge pivot or wall bracket (SF54, L91, Ph3b).
- 6. Possibly part of a keyhole escutcheon (SF57, L61, Ph3b).

⁴⁰ F.H. Garner and M. Archer, English Delftware (1972), 4, pl. 2C; R.L.S. Bruce Mitford, 'The Bodleian Extension', Oxoniensia, iv (1939), pl. XV.3; early 17th-century.

⁴¹ Hassall et al, op. cit. note 34.

⁴² M. Mellor in B. Durham, op. cit. note 33; M. Mellor in N. Palmer, ibid.

43 C.f. F.P. Barnard, The Casting Counter and the Counting Board (1919), pl. VII, 79.



Fig. 14. Iron finds. Nos. 1 and 2 are from the early levels of the infirmary (Phase 3a), Nos. 3–8 from the later infirmary (Phase 3b), and No. 9 from a college level (Phase 4). Scale ¹/₂.

- 7. Nail, and fragment of curved strip (SF58, L62, Ph3b).
- 8. Chisel, head broken off (SF59, L40, Ph3b).
- 9. Nail, large, round headed, X-ray suggests plating (SF48, L44, Ph4).

Copper Alloy (Fig. 15)

1. Chape, probably from a dagger sheath. Formed from sheet, one edge overlapping the other along the join, and perforated at the back, towards the top, which has a decoratively scalloped edge. The front is



Fig. 15. Copper alloy finds. The chape and buckle are from the later infirmary levels (Phase 3b), the remainder from college levels (Phase 4). Scale $\frac{1}{2}$.

decorated with bands of incised transverse lines, and with four perforations cutting through a saltire of double incised lines. A chape would only be used on a sheath for the more elaborate knife or dagger. This design with the indented upper edge seems to be a late 14th-century form (SF33, L40, Ph3b).

- Buckle with sub-rectangular plates, pin missing. Fragments of leather strap remain within the plates, which are secured together by five rivets. The upper plate is decorated with two lines of rouletting around the edge. An almost identical buckle comes from Leadenhall Street, London. Probably mid 13th-early 14th century in date (SF31, L34, Ph3b).⁴⁴
- 3. Book clasp consisting of two rectangular plates riveted together and splayed out at one end, where fragments of leather strap remain. The larger front plate is hooked at the narrow end, and close to this two holes perforate both plates. The front plate is decorated at this end with an incised double ring and dot, and below with a circle divided into quadrants, each of which is perforated. Its splayed end is decoratively indented.

Similar, though usually smaller, clasps have been found on many medieval and particularly monastic sites.⁴⁵ This particular example closely resembles one from the Oxford city ditch north of the Bodleian Library, dated c, 1550–1650 (SF50, L21, Ph4).

- Weight. Discoidal, with incised rings on upper face close to circumference. It is stamped on upper face with a crown slightly off-centre. Weight 895 g. (1.973 lb). Heavily scratched on both surfaces as if used as a cutting base (SF601, L601/1, Ph4).
- 5. Irregular fragments of thin sheet (from Phase 3b: SF46, L116; SF52, L117: from Phase 4: SF611, L608).
- 6. Possibly a vessel fragment, one edge folded over on one face and lightly ridged (SF53, L527, Ph4).
- Two lengths of chain of triple loops, one of more than 70 links, joined by a binding of round wire (SF43, L521/2, Ph4).
- 8. Ferrule, U-shaped, of thick sheet, edge roughly cut (SF605, L602, Ph4).
- 9. Possibly the lobed head of a stud, identified from X-ray (SF38, L37, Ph4).
- Pins; these are all wire-drawn and all from the college levels. Two had spherical heads, one large (SF42, L512; SF38, L37), while two had wire-wound heads (SF51 L36; SF616, all Ph4).
- 11. Lace tags; each made of rolled up sheet, with closed lower end, and a transverse perforation at the open end to take a securing rivet. The two from hospital levels were smaller (average 27 mm, long, 2.4 mm, diam. SF620, L615; SF621, L616) while those from college levels included one as large as 52 mm, long, 5 mm, diam. (SF49, L35; others SF608, L602; SF613, L604; SF626, L601/1).

THE TILES by MAUREEN MELLOR

Some 310 ceramic tile fragments were found from these excavations. This analysis covers both the floor tiles and roof tiles; no other roof furniture was noted.

Floor tiles (Fig. 11)

The medieval floor tiles (some 70 sherds) were all recovered from college levels, which means that they provide no new evidence for the period of use of the designs. In Phase 4 they included only 17 decorated tiles, and all nine styles can be paralleled locally.⁴⁶

All except two were of the 'Stabbed Wessex' tradition, c. 1280–1320, made in the same production centre (Fabric IIIB). Two of these fragments however are unparalleled, one triangular with inlaid six-petalled floral design (Fig. 11, No. 5), glazed orange, and one printed with curvilinear design (Fig. 11, No. 4). Only two other fragments of printed tiles, with blurred designs, were found (Fabric IVC).

One assemblage contained: four plain floor tiles, three being glazed with mottled green, the fourth with white slip and orange glaze; one rectangular tile, with white slip and orange glaze; and four triangular tiles, made by diagonally scoring and breaking the squares, two having white slip with yellow glaze and two with mottled green glaze. All were from the same production centre as the inlaid tiles.

44 C.f. I. Fingerlin, Gurtel des hohen und spaten Mittelalters (1971), 394, No. 240.

⁴⁵ C.f. M. Biddle (ed.), Object and Economy in Medieval Winchester, ii (1990), 755-8.

⁴⁶ L. Haberly, Medieval English Paving Tiles (1937), Types XXIII; XXIVa/XXIV; XXIV/XXV; XXV; XXXVI; XXXVII; XLIV/XLVI; LXI; LXXII.

Roof Tiles (not illustrated)

422 roof tiles were found. Phases 1 and 2 contained some 25 (6%) tiles brought from elsewhere with infill material. Only seven tiles were found in the reflooring of Phase 3a. The later life of the infirmary and the abandonment contained 38 (9%) tiles (Phase 3b), the remaining 352 (85%) being in Phase 4.

Visual comparison of the tile fabrics against a reference collection at OAU suggested that two production centres had been supplying the hospital (Fabrics III and IIIB), and that another workshop supplied the college (Fabric IIIC) in the early post-medieval period. The production areas may well be local. Two familiar Oxford fabric types (IB and VIIA) were completely absent at St. John's, and two others (Fabrics IIID and VIIB) were barely represented.

Small numbers of ridge tiles from the Brill/Boarstall kiln sites (Fabric IIIA) were present in Phase 3a and 3b.

There was no sign of refurbishment within the infirmary and there were no external medieval deposits with roof tiles which might have helped to confirm the building alignments, e.g. the direction of the roof pitch of the infirmary hall.

CLAY PIPES by MAUREEN MELLOR (Fig. 13)

The clay pipe fragments from Magdalen College included 23 datable bowls of the first half of the 17th century, and some later types.

The bowls were classified according to Oswald's Oxford typology⁴⁷ and his simplified general typology.⁴⁸ Of particular interest were another John Tayler pipe (1660–81, F504/3),⁴⁹ and an unparalleled incuse hand or foot of a bowl Type 3 (F521). Another bowl with 'H' incuse on the foot parallels one from St. Ebbe's.³⁰ Two pipes are illustrated with the contemporary pottery assemblage (F512, Fig. 13, Nos. 23, 24), one an Oxford Type A, the other of Type 4G dating to the mid 17th century.

WINDOW GLASS by C. PAMELA GRAVES (Fig. 16)

The seventeen fragments are all, with one exception, opaque as a result of corrosion. Most are friable and laminating. The exception is SF55 L173/1, the vestigial transparent core from a piece of window glass whose outer faces have been completely lost through corrosion. The remaining glass contains lines of seeds, or air bubbles, indicative of the cylinder, or 'muff' method of glass manufacture. The fragment appears to have formed a triangular side piece from a lattice of quarries, and is probably later medieval, 14th–16th-century, consistent with its recovery from the post-1458 phase of the site.

Two of the painted fragments (SF 41/1-2 L519 Ph4) display pitting on the exterior (undecorated) face. Pitting is a form of decay characteristic of potash glass and provides evidence for corrosion whilst the glass was *in situ* in a window. As far as can be discerned, most of this glass was originally white, with the possible exception of SF60 (L59 Ph3b) which may have been a pot metal yellow.

Of five painted fragments, three are examples of white geometric grisaille glass. One shows the vestigial lobes of a trefoil on a cross-hatched ground, bounded by parallel lines; a second piece shows similar cross-hatching (SF41/1, /2, L519 Ph4; Fig. 16, Nos. 1, 2). A third piece shows the curling stem and lower lobe of a trefoil on what may have been a cross-hatched ground (SF602 L601/1 Ph4; Fig. 16, No. 3). The paint is a red/brown enamel, probably derived from a mixture of gum arabic, iron and lead, which would appear black against the light when placed in a window. The cross-hatching is fairly crude in execution. So little remains of the designs that precise comparison on the basis of style is impossible and consequently only a rough date bracket can be given. Grisaille of stylised trefoils against cross-hatching formed a common type of glazing between the 1230s and 1290s with a repertoire of motifs only recently brought under serious study.⁵¹ Although cross-hatching was less commonly used as a background in the second half of the 13th century, it is retained in the geometric grisaille at Stanton Harcourt, Oxfordshire, dated to between 1250–80.³² The foliage is small but

⁴⁷ A. Oswald in Hassall et al, op. cit. note 34, 251-62.

48 A. Oswald, Clay Pipes for the Archaeologist, BAR 14 (1975), 37-40, Figs. 3-4, 9.

49 Ibid. pl. VD.

50 A. Oswald in Hassall et al, op. cit. note 34, 33, Fig. 51, No. 2, 253, dated c. 1630-50.

⁵¹ J. Kerr, 'The Window Glass', in A. Streeten, *Bayham Abbey*, Sussex Archaeological. Soc. Monograph 2 (1983), 56–70; N. Morgan, *The Medieval Painted Glass of Lincoln Cathedral*, Corpus Vitrearum Medii Aevi, Great Britain, Occasional Paper 3 (1983), BA.

⁵² P. Newton and J. Kerr, *The County of Oxford : a Catalogue of Medieval Stained Glass*, Corpus Vitrearum Medii Aevi, Great Britain (1979).



Fig. 16. Window Glass: Nos. 1-3, white geometric grisaille glass (Phase 4); No. 4, roundel. Scale 1:1.

does not appear to bear fruit, as does that of Stanton Harcourt. Parallel painted lines may define the edges of grisaille quarries, or less rigid forms: e.g. fragments from the Dominican Priory, Oxford, second half of the 13th/early 14th century.⁵³

A small and unusual roundel was recovered (SF 45 L31 Ph5; Fig. 16, No. 4) which bears finer grozing marks than any of the other fragments. The paint was applied as a wash of a redder hue than that of the others and the decoration formed by picking out a series of lines. The glass bears no lead stains but may have been a 'jewel', annealed onto, or leaded into, the base of a crown or the edge of drapery on a figure. In high quality, expensive designs like that of the Beauchamp Chapel, Warwick (1440–62), holes for jewels or inserts were carefully drilled in the base glass. The technique was used in heraldic glass, but the only comparable non-armorial inserts in Oxfordshire are small roundels painted as flowers in the background of a St Thomas Becket panel from Woodstock, now in the Bodleian Library, Oxford, dating from the third quarter of the 15th century.³⁴

HUMAN BONE (Identifications by MARY HARMAN)

Mary Harman writes that the human bone finds comprised one patella (L34), one metacarpal and one metatarsal (L76) and one talus (L628). None showed signs of trauma, and none was especially abraded.

Both L76 and L628 were from early makeup levels for the infirmary floors, and L34 was itself a floor layer. The most likely explanation for small peripheral bones in this sort of deposit is that they come from a pre-existing burial ground which was disturbed during the quarrying of building materials for the hospital. It is important to remember that all the excavated area of the infirmary was made-up ground. The cemetery which was recorded in 1976 (see above) was 40 m. to the north-west, and that recorded by R.L. Poole in 1913 was in the middle of St. John's Quadrangle around 60 m. north-west.⁵⁵ Gunther records a Christian gravestone from this area, but it is not impossible that some of the burials here date from the Jews' burial ground which preceded the hospital.⁵⁶ The human material from beneath the infirmary could have been imported in spoil from this area, or indeed from anywhere within carting range of the 13th-century hospital.

⁵⁴ P. Newton, op. cit. note 52, 7, 216 and frontispiece.

55 CHStJB, iii, 426-7.

⁵⁶ C. Roth, The Jews of Medieval Oxford, O.H.S. n.s. ix (1951), 108.

⁵³ J. Kerr, 'The Painted Glass', in G. Lambrick, op. cit. note 28, 27, 131-208; esp. 170-2.

PLANT AND INVERTEBRATE REMAINS FROM 13TH-CENTURY SILT BENEATH THE HOSPITAL BUILDINGS by MARK ROBINSON

A small sample of water-laid organic silt L702 was examined from beneath the construction deposits of the 13th-century infirmary annexe. A total of 76 seeds and a small assemblage of mollusc shells and insect fragments were identified.

The molluses comprised a fauna of clean moving water including *Bithynia tentaculata* and *Valvata cristata*. Amongst the insect remains were cases of the caddis *Ithytrichia lamellaris* or *clavata*. Both species require running water. There is some doubt as to whether the land on which the building was constructed had been reclaimed from a fish pond or the bed or the river Cherwell itself. The invertebrate fauna suggests well-oxygenated flowing water as might be expected in the river rather than a stagnant eutrophic pond. However, the possibility that the sampe was from a pond which was sometimes flushed out by the river cannot be excluded.

The flora of the deposit included various waterside and aquatic plants such as *Callitriche* sp. (starwort), *Alisma* sp. (water plantain) and *Polygonum hydropiper* (water pepper). There were also remains of terrestrial plants. The majority were from plants which could have grown in damp grassland: *Potentilla anserina* (silverweed), *Leontodon* sp. (hawkbit) and *Gramineae* (grasses). There was a slight presence of tree and shrub remains, with a seed of *Fraxinus excelsior* (ash) and in bud of *Salix* sp. (willow).

Seeds from plants of various types of disturbed ground, for example Coronopus squamatus (swine cress) and Urtica dioica (stinging nettle), were present but not abundant. They included some species which are closely tied to arable agriculture such as Agrostemma githago (corn cockle) and Centaurea cyanus (cornflower). A little chaff of Secale cereale (rye) and a seed of Linum usitatissimum (flax) were also discovered. Finally, there were some possible garden plants: four seeds of Brassica nigra (black mustard) and two seeds of Fragaria vesca (strawberry). The seeds of F. vesca are relatively large, being comparable in size with reference material of cultivated 'alpine' strawberry rather than reference seeds of wild strawberry.

The sample did not contain the cereal bran which characterises sewage deposits. Therefore it seems likely that the arable weeds and cereal chaff were threshing waste which had been discarded into the water. *B. nigra* and *F. vesca* were commonly-grown horticultural plants in the medieval period. It is possible that they grew in a garden adjacent to the Cherwell. However, both readily escape from cultivation, *B. nigra* establishing itself on disturbed ground and river banks, and *F. vesca* self-seeding into semi-shaded places such as low grass under trees and at the base of old damp walls. Both plants would have probably found suitable habitats in the Jewish cemetery which preceded the hospital on the site.

DISCUSSION AND CONCLUSIONS

The fieldwork and specialist studies have touched on many aspects of a hospital which was one of the biggest landowners of medieval Oxford, with revenue from outlying estates which would have made it a major element of the town's economy. It is important to ask whether the quality of buildings matches these generous endowments, and whether the patronage which it clearly enjoyed made it possible to build the entire hospital in a single building campaign (as happened with the college two-and-a-half centuries later), or whether it was expanded in successive phases.

To answer these broad questions it is first necessary to review Salter's estimate of the extent of the precinct, and from this it may be possible to build up a picture of the entire precinct to show how St. John's compares with other 13th-century foundations. Even without an overall model of the hospital it is already clear that it has many features in common with the charitable hospital of Ospringe, and between them they may have lessons for the attitudes to and practice of community care in the 13th century, and the communities which provided these services.

Hospital plans of the medieval period were the subject of a comparative study by W.H. Godfrey, who discussed many features common to a wide range of these institutions: the infirmary; the chapel or chapels; lodgings for the master, the brothers and sisters; and lodging for guests and corrodians.⁵⁷ It is clear from his work that we

57 W.H. Godfrey, op. cit. note 7.

should not expect to find any regularity in the plan however, since in very few cases is there any recognisable formula, as for instance in the conspicuously monastic layout of Norwich's Great Hospital.⁵⁸

At Oxford the hospital lies beneath a 15th-century college with a very formal plan, which masks the 13th-century layout beneath it. We cannot therefore risk applying any generalized rules to the hospital, beyond suggesting a courtyard plan based on the fragments known to Gunther, with the newly-found buildings forming one corner. This is supported by the plan of the contemporary hospital at Ospringe in Kent, where one can see the shape of a courtyard on the east of the infirmary (subsequently encroached upon by medieval buildings) and a looser arrangement of lay or farm accommodation to the west.⁵⁹ The possibility of a similar formal courtyard at Oxford is, however, modified by the positioning of the excavated buildings, which must by any analysis rank high in status within the complex, and yet they extend onto a purpose-built embankment over an old waterway or fish-pond (see below). Were they later additions to a smaller plan, or part of an original plan designed on a scale which could not be adapted to fit the site without extensive infilling of the waterway, a waterway which would itself have had economic importance to the owner and possibly also strategic importance to the town? To decide these questions it will be helpful to look at what was here in 1231 at the foundation.

LAND OUTSIDE THE EAST GATE IN 1231 (Fig. 2)

The documentary background of the eastern suburb is summarised above. If Salter was correct in believing that the first Hospital of St. John existed by 1189 on a site close to the city wall east of St Peter's church, it was probably quite distinct physically from the site of the 13th-century replacement.⁶⁰ At this time the excavation area would have been still under water (L171, L702), and Mark Robinson's report on the environmental remains would fit best with part of the river Cherwell or a well-oxygenated pond. Some plants are indicative of garden-type cultivation, and this would agree with the description of 'garden' for the land alongside, which was the burial ground of the Oxford Jews. This property had recently come into the king's hands as protector of the English Iews, and he had now granted it to the hospital for its new buildings.⁶¹

Fig. 2 is an attempt to combine the documentary evidence with the archaeology and topography of the area. Salter seemed to feel that the hospital occupied the same roughly square plot into which the medieval parts of the college now fit, roughly 300 ft. along its east and south boundaries.⁶² There is therefore a *prima facie* correspondence with one dimension of a 13th-century plot on the opposite frontage, which is described as 300 ft. long lying 'along' the road, and which in 1294 became a lay cemetery of the hospital.⁶³

The surprising point here is that the road to East Bridge was so undeveloped. On the south side Salter identifies three tenements (Fig. 2, Nos. 2.2-4), but logically they must have been behind this piece of land, set back 80–90 ft. from the highway.⁶⁴ The

58 Ibid. 29.

60 CHStJB, iii, p. ix.

61 CHSt/B, iii, pp. xiv, xv.

62 CHSt/B, iii, p. xv.

⁶³ CHStJB, i, 38-40, Nos. 37, 39; note that on p. 19 Salter gives a different account of the alignment of this plot.

64 CHSt/B, i, Tenements 2-4, Charters 17-36.

³⁹ G.H. Smith, 'The Hospital of St. Mary of Ospringe', Archaeologia Cantiana, xcv (1979), 85, Fig. 2.

corresponding frontage on the north side clearly had enough room to build the new hospital, with only one existing house, while further west was Gravel Walk with the site of the later Greyhound inn set back up to 14 m. from the modern line of the High Street.⁶⁵ Similar frontages on the road to Oxford's South Bridge were already being reclaimed from the river and vigorously built up at this time, and Tenements 2.2–4 at East Bridge would seem to be losing out on the potential of passing trade.⁶⁶ Nevertheless the long vacant plot seems to have survived, and Salter was prepared to postulate that from the refoundation of the hospital until 1291 it functioned as a substitute cemetery or garden of the Jews,⁶⁷ replacing the much larger plot on the north side of the road which the king had granted to the hospital. He also implies that it was the residue of a property which was formerly on both sides of the road.⁶⁸

Could it be that the reason this road ran across part of an undeveloped plot was that it was a new alignment? The implication would be that the bridge had been rebuilt, and that Tenements 2.2–4 were in fact on an old street line 80–90 ft. to the south, but there is no documentary evidence of bridge-building in the 13th century, and the present bridge makes such a natural line between East Gate and St. Clements that such an argument must remain open.

THE HOSPITAL SITE (Fig. 2; Table 1)

A garden plot 300 ft. square (about 97 m.) at Oxford would have been big enough to accommodate all the hospital buildings which are known or suspected at the *Maison Dieu* hospital of Ospringe.⁶⁹ If however the excavated Oxford buildings, together with those recognised by Gunther in the north cloister range and the High Street range of the college, constituted three sides and one corner of a single hospital quadrangle, it would have covered twice the area of the claustral complex of the college, and three times the area of the principal quadrangle of buildings at Ospringe (about 50 m. \times 60 m.). At Oxford there is clear evidence of a structural succession where the east range is jointed onto the south range (F710), and possibly a hint that the north range is later still, assuming that the garderobe buttresses are accepted as evidence of a 14th- or

TABLE I: INITIAL SIZE OF COMMUNITIES AT OXFORD AND OSPRINGE

	Chaplain Brothers	Lay Brothers	Lay Sisters	Infirm	Corrodians etc.
Oxford 1246	3	6	6	8-10	68
Ospringe	3	4-	-6		

Sources: CHStJB, iii, pp. xvii, 395-6; M. Rubin, op. cit. note 3, 173; V.C.H. Kent.

⁶⁵ CHSt/B, i, 78; for the Greyhound (1526) see J. Munby, 'The Origins of Oxford Inns' in 'The New Inn', Oxoniensia (forthcoming).

66 B. Durham, 'The Thames Crossing at Oxford', Oxoniensia, xlix (1984), 95.

67 CHStJB, i, 38.

68 CHStJB, iii, p. xv.

69 G.H. Smith, op. cit. note 59, 61, Fig. 2.

15th-century date, as at St. Cross Hospital, Winchester, and elsewhere.⁷⁰ This would imply that building work progressed round the courtyard from south to north, working away from the road. With no evidence of structural modification to any single building, it seems fair to assume a single preconceived plan, much larger than the Kentish hospital. Admittedly the Oxford community at its refoundation was slightly larger than Ospringe (Table I), but there is nothing in the foundation statistics to corroborate such a disproportionally large plan. The size of Oxford's town population must have been a factor, because it would have greatly outweighed the number of residents of Ospringe even when swollen by pilgrims on the Canterbury road. It is therefore reasonable to visualise the overall layout at Oxford as larger than Ospringe, although perhaps with its functions similarly divided into formal courtyard and farm area, the farm at Oxford being perhaps the detached north range shown on the 16th- and 17th-century maps.⁷¹ The limiting factor in getting the largest possible rectangular plan for the formal courtyard would have been the south-east corner, where every yard won back from the water would have added a vard onto the potential overall dimension of the hospital courtyard. On this argument the evidence would favour an initial decision to build on a large scale, which took time to come to full fruition.

CONSTRUCTION SEQUENCE OF THE HOSPITAL (Phase 2)

Construction work on the first hospital buildings must have begun almost immediately after the foundation, because there is a grant of timber from Shotover in October of 1231.⁷² Two buildings were to dominate the south-east corner of the courtyard. The south range building is provisionally identified as the infirmary because of its twin-hall layout, with a special treatment of its eastern end, and because it is structurally the earlier of the two excavated buildings, which is what one would expect of a building whose function came so high in the priorities of the foundation statute.

A suggestion of experimentation in the design of the new foundations would also support the idea that the excavated building was an early part of the construction programme. The mason used a continuous footings for the east end-wall and the north wall, both built directly on the concreted sand under the river-bed (L87, L88, L549) before the channel was reclaimed. Each of the pier bases was treated similarly, but the south wall closest to the bridge was on rubble piles (F544/703 and F723) linked by foundation arches dug into existing fill material.

Foundation arches are typical of the Oxford mason's response to bad ground, and the logical conclusion is that there was already a good depth of dumped material in the waterway on this south side, enough to form the centering which is essential to support the stones of a relieving arch during construction. The presence of pottery typical of the early Brill industry would argue that the dumping was no earlier than the second quarter of the 13th century; in fact if this was indeed a 1231 building, this material would be the earliest sealed assemblage of Brill pottery known. There are two possible explanations:

1. the dumping could have been the mason's first attempt to reinstate the area;

⁷⁰ M. Wood, *The English Medieval House* (1965), 184, Fig. 58; Godfrey, op. cit. note 7, 45. The buttresses surviving on the north side of the cloister date of course from the rebuilding of 1824, but their massive size suggests that they were designed as replicas of those seen by Buckler. I am grateful to J. Munby for pointing out that their present spacing may reflect pre-college origins.

71 Agas (1578); Loggan (1675).

72 CHStJB, iii, p. xv.

2. it could be a pre-existing embankment, but very recently built, conceivably connected with new developments on the bridge or ford.

Under 'Land Outside Eastgate' (above) it was accepted that the notion of new bridgeworks on the Cherwell at this time was too speculative to be considered at present, and in view of the pottery in the dumped material it will be safest to assume that the dumping was no earlier than 1231, i.e. that it was related to the hospital. However the disparity between the various foundations would tend to suggest a lack of planning, or at the very least a measure of disorganisation, and in the writer's view this would fit best in the months immediately after the king had granted the land and his approval for the new hospital.

It will therefore be assumed that the building beneath the Kitchen Yard was amongst the first buildings after 1231, well before the 1250 date for the hall butted onto its north side as suggested by Dr Morris' dating of the doorway. The shape, the orientation, the dating and the experimentation all support the thesis that the complex pierbase structure was indeed the infirmary, and that the Brill pottery from the dumped material is truly the earliest known, in use before 1231.

CONSTRUCTION OF THE INFIRMARY

Without knowing the extent of the old waterway it is of course difficult to assess the scale of the mason's problems, but his first job may have been to build the east wall (F39) to shut himself off from the river. The way that its foundation widens progressively northwards suggests that he was deviating slightly from an established river line, which might have been a pre-existing embankment dividing the waterway from the river. The site must have looked strange at this stage, with workers paddling around to build piers in the mud of a drained pond, perhaps following the lines of setting-out strings above their heads. This image alone justifies the effort put into salvage recording, because it would never have been guessed from the formal excavation. Indeed the very disturbed west edge of Trench IV shows why it had been impossible to sort out the relationship of the culvert (F41) to its supposed river bank during the formal excavation. The realisation during the contractor's work that the culvert had itself also been constructed in the bottom of the waterway provides an explanation for the thickness of its west wall; the extra thickenings along its length (F70/1, F80, F162) would have provided essential support for the culvert arches and the stair (F41/1-/6, F131) until permanent support was provided by the infill behind.

The sequence of building and reclamation therefore leaves no doubt that the culvert was an integral part of the design of the east end of the infirmary, as integral as the arrangement of pier bases. It would have been easy to conclude that this annexe had been added to the twin halls as an extension, but since there was no previous phase of east end-wall, and since the culvert and the piers of both the annexe and the twin halls were all infilled by a single phase of dumping, they must all be contemporary and must have followed the careful planning of what would be needed. An important part of the archaeological reconstruction will therefore be to speculate what sort of building might have been envisaged, and how the mason might have planned to achieve it.

SPECULATION ON THE DESIGN OBJECTIVES INDICATED BY THE INFIRMARY LAYOUT

Medieval hospital infirmaries' halls tend to have a chapel nearby for the benefit of the inmates, normally adjoining the main hall, and often forming its east end where the hall

is lying roughly east-west. The main hall would normally have either one or two arcades, i.e. the twin-hall type with a single arcade down the middle, or the aisled type with an arcade each side of a central nave. Infirmaries in monasteries are almost always of the aisled type, but both types occur in the charitable hospitals, and the obvious rationale, which is attributed to an example as early as 1089, is that twin halls allowed males and females to be segregated more easily by a central curtain.⁷³ Their simpler roof carpentry would probably be seen as another advantage in a charitable hospital if it meant lower building costs, but it would create the problem of disposing of water from the very long central valley.

The Oxford community seems to have opted for a twin-hall infirmary (Fig. 18). There is perhaps a small concession towards giving it an east–west orientation (Fig. 4), but it has really been placed as close as possible to the road and ford. Otherwise what little is known of it is based on comparisons with other examples. It is 25% wider than St. Nicholas' at Salisbury (also 1231).⁷⁴ St. Nicholas' however gives a prime example of the difficulty of building a chapel on the same axis as a twin-halled building, because here there were two parallel chapels. The thrust of the central arcade was taken by a buttress in the east end, and this would have made it impossible to provide a central east window. Such an awkward arrangement gives a possible explanation for the curious pattern of pier bases at the east end at Oxford. There is good reason to think that the infirmary had its own chapel, because in 1245 the hospital kept a light burning in the infirmary, as had been done in its predecessor *c*. 1210.⁷⁵ Logically this light would have been in a chapel, and would strongly suggest that one of the *capellas* mentioned in 1245 was part of the infirmary; if so, then the most likely place to find it would be at the east end where we find the unusual architecture.⁷⁶

The conflict between the administrative and architectural convenience of twin halls and the aesthetic or spiritual satisfaction of a central east window may therefore have been solved at Oxford by a classic compromise: the infirmary was to switch from a twin-halled to an aisled layout for its easternmost two bays. Whether the master mason knew what he was taking on we shall never know, but the bases of the aisled bays were certainly built more lightly than those to the west, implying that the structure had been thought out in advance.

Two alternative roof designs are offered for the annexe in Fig. 18. They differ on whether there was to be a pair of longitudinal two-bay arcades, which seems the logical solution; or whether it was a three-bay cross-arcade, the roof line of which would have run into that of the 'warden's hall' which was apparently added on at this point without the need for its own independent gable wall. The latter would be very unconventional architecture, with the piers of the cross-arcade supporting the ridge of the roof, but it would avoid the awkward way that the 'aisle' arcades would have to spring from the arches in the gable end of the twin hall. One final consideration is the drawing of the Oxford hospital after Matthew Paris, which could be showing the infirmary. If so, it had a tower near its east end, and the eastern annexe beyond this had a lower roof in line with the remainder i.e. the aisled option.⁷⁷

⁷³ I am grateful to Tim Tatton Brown for discussions on a recent survey of the hospital of St. John of Jerusalem at Canterbury. It was founded by Lanfranc in 1084–5 for 30 old men and 30 old women, and Dr. Tatton Brown suggests that the symmetrical plan of the chapel, dorter and reredorters are for men on one side and women on the other; see also Godfrey, op. cit. note 7, 33.

⁷⁴ RCHM, City of Salisbury, i (1980), 54-6.

⁷⁵ CHStJB, i, 266; ii, 207.

⁷⁶ CHStJB, iii, 7.

⁷⁷ CHStJB, iii, 433.

The evidence, such as it is, seems so finely balanced that it would be unwise to draw a conclusion. The mason clearly had an objective in mind when he set out his foundations, and whatever he produced seems to have survived the lifetime of the hospital.

Much space has here been devoted to a discussion of the substructure and planning of the excavated east end of the infirmary, passing over the question of the shape of the building overall. Its length remains a matter of speculation, but considering the way the east annexe or chapel extends over the fish pond it is fair to assume that the mason had problems accommodating the length of the halls. In Fig. 4 it is therefore shown proportionate to the partly surviving six-bay infirmary halls of St. Nicholas' Hospital at Salisbury,⁷⁸ and at a right-angle to the axis of the kitchen. This gives a west end-well just short of the surviving 13th-century 'charnel' in the High St. range, with space for a small cemetery between, which is perhaps the most symmetrical arrangement one could hope for given the difference in alignment. The infirmary and indeed the entire plan of the south-east part of the hospital could therefore be seen as respecting a ramp down to the Cherwell ford next to the bridge.

THE WATER SUPPLY (Figs. 2, 17, 18; Pl. 1, 3)

It has been shown from the sequence of construction that the culvert was an integral part of the mason's plan. The Ospringe infirmary also had a culvert, but at Oxford the access stair shows that the culvert had a function within the building, and was not just following a convenient route to somewhere else. Assuming that the Ospringe infirmary was also making use of the culvert water, it is clear from the plan that it was getting 'first use' of a water supply which went on to feed the *necessarium* adjoining the kitchen and then the *garderobe*, and is therefore unlikely to have been used as a latrine within the infirmary. At Oxford the positions are reversed, and we cannot say what building if any may have had first use of this water; but the quality of the stonework, particularly the rebated floor slabs, and the open stair in what was arguably the infirmary chapel, suggests that the culvert was intended for clean water at least where it entered the infirmary, even if it was contaminated by the time it left. This is borne out by the lack of silting or staining when the channel was abandoned.

Before conjecturing why these two infirmaries needed water supplies it is worth considering the likely source at Oxford. In 1246 the Oxford hospital had an aqueduct from a spring at the corner of the town ditch known as Crowell, and there is no reason why this should not have been there from the foundation.⁷⁹ Alternatively there could have already been a leet from sufficiently high up the Cherwell to provide a year-round flow, perhaps a functional continuation of the waterway which was infilled at the time of construction. The latter would explain the location of the water at the east end of the infirmary, without the need to impute any special purpose there (see also below, 'The Life of the Infirmary', for the later water supply).

The culvert end of the building was postulated above to be the infirmary chapel because of the architectural plan of these eastern two bays, but the water supply may affect this conclusion; monastic houses have flowing water in sculleries, *lavatoria* and garderobes, not in chapels.⁸⁰ If this annexe was planned as a scullery, then it would

⁷⁸ RCHM, City of Salisbury, i (1980), 54-6.

⁷⁹ CHStJB, iii, p. xxiv; H. Hurst, Oxford Topography, O.H.S. xxxix (1899), 138.

⁸⁰ R. Willis, 'Architectural History of Christ Church, Canterbury', Archaeol. Cant. vii (1868), 196, pl. 1, 2.



Fig. 17. The infirmary culvert. Above, south elevation of outfall, with and without blocking; middle, inside elevation of west wall of culvert showing graffiti and straight-joints; below, as above, reconstructed to show the relationships of culvert arches and stair to the three-bay arcade bases.



Fig. 18. Two alternative roof reconstructions for the infirmary east annexe: above, the 'aisled' option; below, the cross-roof option.

surely be walled off from the infirmary with a communicating door; similarly with a *lavatorium* or garderobe where it might also be divided into male and female sides.⁸¹ There is therefore no inherent reason to discount the chapel hypothesis, and discussion of the use of the water has to take account of the possibly sacred location. If this was spring water from Crowell then it might have been intended for drinking purposes, but this is less likely if it was river water, because a well would be cheaper and more hygienic. A final option would therefore be for washing in the sense of ritual cleansing, as might be achieved by an inmate sitting on the steps at the side of the chapel and pouring, or having someone else pour, water over him. To the community which was specifying its requirements on the king's behalf, this may have seemed a thoroughly satisfactory way of providing special washing facilities for patients in an institution dedicated to the Baptist, and may have justified the extravagant use of freestone in constructing the culvert, only a fraction of which would ever be seen again.

Medieval infirmaries are very often placed close to a water supply, but there is little evidence to show what direct access they had to it. At Ospringe the culvert was too eroded to show whether the water was usable from within the infirmary. At Christ Church, Canterbury, the 12th-century illustrations show that the main piped supply, a distribution pipe and a waste pipe all ran under the infirmary hall and/or its kitchen, but the manuscript illustration shows no 'standpipe', trough or chute whereby any of this water could be used.⁸² At St. John's, Abingdon, it has always been known that the River Stert runs in a culvert under the hospital, and it is now apparent that this is a leet taken off the natural watercourse which has itself been lost to local memory for over a century, but there is as yet no evidence of an access within the hospital.⁸³ St. Nicholas' at Salisbury is beside Harnham Bridge on the Avon immediately south of the cathedral close, and would be well situated to receive a leet from the river, but again there is no evidence of any access.

These water sources would be providing river water, but there are plenty of accounts of the healing properties of springs and other special watering places. A well-authenticated example was John Trelille who in 1640 had been crippled for sixteen years, and was healed by travelling to Madron Well in Cornwall, and washing in the stream which ran from St. Maderne's well in the chapel there.⁸⁴ Trelille apparently recovered enough to become a soldier, but the consensus of modern opinion seems to be that such healing properties came mostly from the faith or conviction of the patient. If the medieval Cherwell or the Crowell spring provided that conviction then we should expect it to have been recorded in the literature, and it is not, at least not for the hospital period;⁸⁵ the little rhyme which was written above the door of the well-house at Crowell in Anthony Wood's time:

There's none that will hurt this well that's wise, For it hurts none but helps the eyes⁸⁶

⁸¹ C.H. Talbot, Medicine in Medieval England (1967), 146-7.

⁸³ A video recording made on behalf of the Vale of White Horse District Council illustrates how the Stert was progressively culverted by infilling with brick between groined stone bridge arches. Where the water runs beneath the nave of St. Nicholas' church outside the Abbey gate it is in a stone vault, which continues under the north part of the hospital. I am grateful to Mr. Horne of the Council for providing a copy of the tape.

⁸⁴ J. and C. Bord, Holy Wells and Water Lore in Britain and Ireland (1985), 46.

⁸⁵ I am very grateful to Dr. Margaret Pelling for discussion of the St. John's evidence in the light of recent research on the history of medicine, and for her invaluable guidance.

⁸⁶ A. Clark (ed.), Wood's City of Oxford, O.H.S. xv (1889), 385.

⁸² Willis, op. cit. note 80, 84.

only serves to rank it with the commonest type of healing waters, as identified in a recent study.⁸⁷ If there was a ritual cleansing by sacred water, i.e. 'lustration', it does not seem to figure in the medieval world, although A.E. Brown notes a strong local tradition that the leper hospital of Burton Lazars was sited to benefit from local healing springs, which were later used to feed an 18th-century baths.⁸⁸

Perhaps therefore we should avoid being biased by the quality of the construction. Perhaps this sort of freestone was being used elsewhere in the hospital, and perhaps the unusual architectural plan had no ritual significance. The water supply would be simply a matter of good hygiene, as one would find in a monastic *lavatorium*, and it had been brought into the building in this case largely because the users were to be the infirm. There is just a hint of this in the construction of the culvert, because eight straight-joints in the west wall have yet to be explained (see above, Field Investigation, The Infirmary Culvert). Is it remotely possible that at the time of building the mason had devised a modular treatment of the culvert, with a 3-ft. long bay upstream from each of the culvert arches, which in one of the modules was to be a stair, and in the others was to be some other sort of hygienic facility which was never built? This would surely weaken the argument that the annexe was planned as a chapel, but it needs to be borne in mind because it is one more of a series of inexplicable features in this remarkable building.

On balance there is therefore not quite enough evidence of the medieval use of non-sacred water as a healing medium for us to be confident that this is what was in the mind of whoever commissioned the design of the east annexe and its water steps.

For the later story of the culvert and its possible replacements, see below under Phase 3. The historical account must turn to events beyond the planning stage.

INFILLING THE INFIRMARY FLOORS

On completion of the stone substructure of the building, the old waterway deposits inside it were covered with 1.1 m. of dumped material, mostly gravel, to bring the floors up to level. This would have made it look much more like an ordinary building site; it is not possible to say whether the area to the north was infilled too, or indeed whether the waterway was just a local bay-like inlet related to the bridge and ford, little bigger than the infirmary itself. Either way, the mason had recognized that he must clear the silts to provide a firm bed for his load-bearing structures, but he was prepared to leave a thick layer of silt elsewhere, and there were certainly signs that the early floors had settled and cracked around the edges of one of the stone piers (F623).

Records from Trench VI show that there were successive layers of very hard-packed mortar and gravel under the big arcade, which were thought during excavation to be an old roadway, but perhaps in fact were an area for mixing mortar. There were no floor tiles with conspicuously early designs so it is possible that the original floors were simply of mortar.

This completes the story of the primary structure of the infirmary building as it can be deduced from archaeology alone. In the absence of any significant pieces of worked stone the architecture must remain a mystery, but it is clear from Buckler's drawings of the charnel and the recent survey of the kitchen that other hospital buildings were decorated. St. John's infirmary may in its prime have been a very elegant building.

88 Pers. comm.

⁸⁷ J. and C. Bord, op. cit. note 84, 88.



Fig. 19. Reconstruction of south-east corner of hospital courtyard, with the college roof trusses inset.

THE HOSPITAL HALL (Figs. 4, 7-10, 19)

Immediately north of the 'chapel' end of the hall was a 13th-century building which had been butted up against it, but built of materials which were so completely different that it must surely have been a separate contract (F710). Its south gable end was formed by the north wall of the infirmary chapel/annexe (F704), under which ran the water culvert, and through which was a communicating door (F704/1). Our survey has corroborated the suspicions of previous writers that the building belonged to the hospital period,⁸⁹ and we can now provide a date of 1230–50 for the decoration of its west doorway (F1012). The height of the rere-arch of the adjoining window seems to confirm that it was an open building (Fig. 7, 8 (inset)), and the bay-spacing (4.4 m.) is given by the ashlars in the east wall (Fig. 8). The east window has a wider rere-arch, 1.9 m. compared with an estimated 1.5 to 1.6 m. for the west window.

Given the quality of preservation of this building it is perhaps fortunate that the contractors' work never went deep enough to disturb its hospital-phase floor levels, but the penalty is that there is no evidence on its construction, nor on the line of the culvert, or any connection between the culvert and the later well F1010.

What was the function of this open building? The possibility cannot be ruled out that it was a replacement infirmary chapel, taking over the functions suggested for the east end of the infirmary, but it seems disproportionately large, its orientation would have conflicted with that of the High Street chapel, and the doorway communicating with the infirmary is very small and out of the way. If on the other hand it was a hall for the warden or the king's almoner, then the elaborate doorway from the courtyard might

⁸⁹ CHSt/B, iii, 425; RCHM, City of Oxford (1939), 74.

have led into a screens passage, with a *solar* at the north end, which might have been a *camera regis* to borrow a term from Ospringe. This would however assume that the functions of kitchen and buttery could be squeezed into about 7 m. length of the range to the south, and although this would be a generally similar functional arrangement to that at Ospringe, and would also be a remarkable story of continuity of the kitchen function, it is difficult to believe there is enough room. Again therefore the available concepts of hospital design do not provide any models which fit the evidence.

THE LIFE OF THE INFIRMARY (Phase 3, Figs. 2, 4, 5)

Evidence for the internal organisation of the building falls into three classes: the record of floors and internal partitions, both 'rescue' and salvage; artefacts from internal deposits; and external data from other known hospital sites.

Some twenty-five years after the introduction of the Winchester open-area system of archaeological excavation we had found ourselves forced to excavate St. John's infirmary on a 'Wheeler grid' of two-metre squares, not through choice but because it so happens that a college bath-house cubicle and an engineer's mass concrete footing are both, roughly, the size of a 'Wheeler box' and this was the extent of the hospital archaeology. Interpretation of such a fragmentary picture has to be based on a logical framework, and the writer is assuming firstly that the shape of the building and its load-bearing piers are accepted, and secondly that like other infirmaries it might ultimately have been divided into cubicles down each side, possibly with a different function at the east end.

We have speculated above on the design objectives of the infirmary, trying to imagine what the hospital community may have specified to their mason. They must also have given some thought as to how the internal space would be divided up, but if in the first instance it was to have been by means of curtains it need not have been an overriding factor of the design stage. Nevertheless one of the first fruits of analyzing the substructure of the east annexe was to detect a module of about 9 ft. 6 ins. (2.9 m.) in the spacing of the culvert arches, a similar dimension (3 m.) between the culvert and the 3-bay arcade and, thirdly, the foundation of something resembling a partition base aligned with one culvert arch. In the twin halls themselves the best we can do is to use the two pier bases of the central arcade to estimate the bay spacing, and the result of about 20 ft. (6 m.) would mean that a 9 ft. 6 ins. or 10 ft. module would fit comfortably down each side. This seems to be borne out by the position of the walls found in salvage work, and in one place it is possible to visualise a large part of one cubicle (F709, F711–712).

There is no way of knowing when the infirmary was partitioned, but it is clear that both inside and outside the 'cubicles' the infirmary floors were as grey as many domestic house floors of the period. The discolouration would have been charcoal and ash from fires or braziers, and in places there were the scorch marks of the fires themselves. The infirmary had stood through 250 winters, and it would not be surprising therefore to find that open fires had been made in many places. In one area, however, the floors were less discoloured and there was no scorching, this being the annexe east of the 4-bay arcade. This may be evidence that, for all its modular construction, this was never an area of private cubicles even after the abandonment of the culvert, and it supports the arguments that the annexe had a specialized function, i.e. a chapel.

The abandonment of the infirmary culvert is the major archaeological event within the life of the infirmary, and it has been used to indicate the end of sub-Phase 3a. It is assumed to have been a conscious decision, because otherwise one might expect signs of neglect, silting etc. Amongst the minimal bottom deposits a quantity of mid 13thcentury pottery included mainly jugs of a quality which would be regarded as tableware. They were concentrated just downstream of the steps, perhaps a hint that they had been used to collect the water for drinking or washing.

It is clear that the main culvert had given off, or more likely received, a side branch (F112). It is difficult to see how it worked, but since its opening to the main culvert was two courses up it must have been flowing in and not out. This inlet was now blocked by a rubble wall, perhaps with its original flow now reversed and directed out straight into the river, since it was not infilled until the 18th century.

Why should the infirmary culvert have been abandoned precipitately? The pottery dating is significant, because in 1267 Merton College was granted permission by the king to take water from above St. Cross chapel. The new conduit was to pass either above or below ground through the area of the chapel and courtyard of the hospital. across the great road, then south to the barton of St. Frideswide, skirting the city wall and entering the college through a gutter, leaving by another gutter.⁹⁰ The water was intended for cleansing the college's courtyard, so it may have been only river water, but above St. Cross chapel there is also the Holywell spring, which could have provided clean water. The archaeology at Magdalen would tend to favour the river water option. because this would explain the large ditch choked with fine silt along the south side of the infirmary, with just a few sherds and some ridge tiles. This was not a typical roadside ditch therefore, but it was a channel which had been allowed to silt up slowly out of neglect. The dating here was of the 14th and 15th centuries, and it seems possible that this was an outfall from a replacement water system shared with Merton College, which by its construction had disrupted the hospital's original supply. This may have been the source of the water which flushed the series of latrines recorded by Buckler in the north range of Magdalen's cloister, which Gunther assumed to be a relic of the hospital. It may also have fed the lavacrum in medio claustri which was repaired by the college in 1483, in which case the college was continuing to use the hospital supply, and it is possible that some of the ditches shown on Loggan's map are relics of this medieval system (see Fig. $2).^{91}$

HOSPITAL BUILDINGS IN THE COLLEGE PERIOD (1458 onwards, Phase 4)

When was the infirmary taken down? The twin halls must have mostly gone by May 1474 when the chapel and hall range was being built, and the college was largely complete by 1480. Whether the east end of the infirmary came down at the same time is not certain, but considering that the ground level at this corner of the college has been raised by 1.2 m. it is probable that there was whosesale destruction to create this quantity of fill. The lines of the south and east walls of the infirmary seem to have survived where they doubled as a boundary, although the rusticated plinth suggested that the south wall had been rebuilt (F505). Indeed if we risk taking Agas' map literally there was a building along the southern boundary by 1578. Archaeology gives very little information on the use of this south-east courtyard, except for a sequence of clay pipes of the 16th and 17th centuries, a half groat of Mary or Elizabeth (No. 1), and two exotic groups of pottery (Figs. 12–13).

A likely date for the destruction of these last echoes of the infirmary seems to be 1635,

⁹⁰ G.C. Brodrick, Memorials of Merton College, O.H.S. iv (1885), 304.

⁹¹ H.A. Wilson, The History of Magdalen College (1889), 27.

when the college began pushing out its boundary into the Cherwell to create space for the gentleman commoners' rooms and the food preparation rooms on the riverward side of the kitchen. The robber trenches of the infirmary east end give a date in the early 18th century however (F33), and it may be that the enlargement of the kitchen yard came later; certainly by 1750 Taylor's map is showing the area in its present form, with an L-shaped building in the south-east corner, of which the footings were seen in the machine excavation (F47, and stone-lined pit F92).

The kitchen was a different matter, a building which the medieval and later college could use and extend, in a uniquely convenient position to serve the new hall. The brief historical account above (Kitchen Survey: College Phases) gives the conclusions of the archaeological survey, down to the preparation of the last meals in 1988. This last recognisable hospital building has since become a ritual focus in the life of the college, a Common Room of great popularity amongst the fellows and junior members. None of the ashlar work is now visible, so it is not possible to appreciate the scale of the medieval window openings, but the great fireplaces give it a flavour of its antiquity, and one needs only to go outside into the kitchen passage to find the newly exposed head of the hall doorway, its jambs buried almost to the level of the decorated capitals.

Outside on the terrace of the new kitchen block, part of the facing is in 13th-century ashlar recovered by the college from the west lining of the hospital culvert. The blocks were cut to a standard 150 mm. depth by Messrs Joslin's to give the maximum display face irrespective of whether they were originally facing blocks or quoins, and while many of them have therefore ended up longer than in the original face and have therefore disrupted the pattern of straight joints, and while many of the arch springers and chamfered jambs have disappeared, the facing gives a flavour of the inside of the drain and its remarkable array of graffiti, much of it in its original relationship.

What has been learnt from this study of a college in transition? We now have almost half of the layout of a great hospital courtyard, which had been planned with care and considerable ingenuity to make the maximum use of an awkward site, suggesting that regularity was of considerable importance. We have seen a new and innovative way of finishing the end of a twin-halled infirmary which seems to be a considerable development on the Salisbury hospital; we have seen that the east end included a carefully built water supply system, with a unique access stair within an annexe to the infirmary which otherwise has all the signs of being a chapel; and we have seen a fine hall grafted onto the side of this annexe, seemingly the springing of a full east range to the great courtyard, but showing signs of being a separate building contract.

The more fundamental questions asked at the outset were whether this flowering of 'medical' architecture at Oxford reflected a real change in the social conscience of the day, rather than simply an extension of the new architectural momentum into the area of community service; and whether this was really the architecture of healing, or whether it should be seen as an example of 'conspicuous waste' resulting from the availability of superfluous funds in 12th- and 13th-century England, the prelude to steady decline. Certainly the ingenuity put into the culvert system did not prevent its early abandonment, which might argue that it had been an extravagance. But it was still in good order and clean when it was infilled in a very deliberate way, and it seems that it was replaced by another water supply in the same general area; and the way that the buildings progressed round the courtyard suggests that the will and the ability to invest in the fabric continued. Partitions appeared in the infirmary, the damaged shaft of the 'hall' doorway was repaired, and both the buildings seen by us seem to have survived the lifetime of the hospital. On balance therefore the archaeology would suggest that the community was able to transcend any extravagance there may have been at the outset.

Whether what we saw had anything to do with healing as such is a more difficult question, and one which will probably need to await the uncovering of other infirmaries of the period.

So the institution was probably maintaining its premises in a responsible way. As to the extent and layout of those premises, no medieval hospital building in England has been subjected to such close scrutiny both above and below ground in recent times, but one thing is clear: on this experience any future investigation of a hospital of this period must expect to come across so many contradictions that the rule will continue to be ... there is no rule!

The Society is grateful to English Heritage for a grant towards publication of this paper.