

The Carpentry of Seven Cambridge College Doors

by

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assisted by

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Seven massive doors, chosen from among the many in Cambridge, show a variety of methods of construction which unite great strength, to the rear, with impressive decoration, to the front. They range in date from 1443 to 1615 and demonstrate the change from medieval to Renaissance carpentry at the highest social level.

INTRODUCTION

Large doors for the gatehouses of palaces, churches and colleges were among the most demanding tasks required of the medieval carpenter. Not only were they required to be secure in a violent age but they also had to signify status, both in their solidity as well as in their decoration, using contemporary iconography.

Carpenters often incorporated various techniques taken from other crafts. The door of Hadstock church in Essex, made during the Anglo-Saxon period, has planks fitted to the round stiles by iron lozenge-shaped roves and rivets. This technique was used for the wales of early ships such as the Nydam ship made c. AD 200. This technique of using roves was still being practised for doors as late as 1597 in the rear portcullis frame of the door of Queen's Gate at Trinity College. During the Norman period portcullis frames were used in castles to protect an open doorway. These were made of strong squared bars, jointed as an open frame that can be seen through, but which presents a barrier to intruders. The carpenters found that the squared bars of such a frame made a good foundation for a planked door. Several Cambridge doors of the fifteenth century are of the portcullis type.

Big doors usually comprised two door leaves having two heads—or inner meeting edges—cut to a simple half-round tongue engaging in a matching hollow to ensure a good shut. In this arrangement the two doors can only be opened or shut together. It is not possible to discuss doors without mentioning their iron fittings, hinges, bolts and nails.

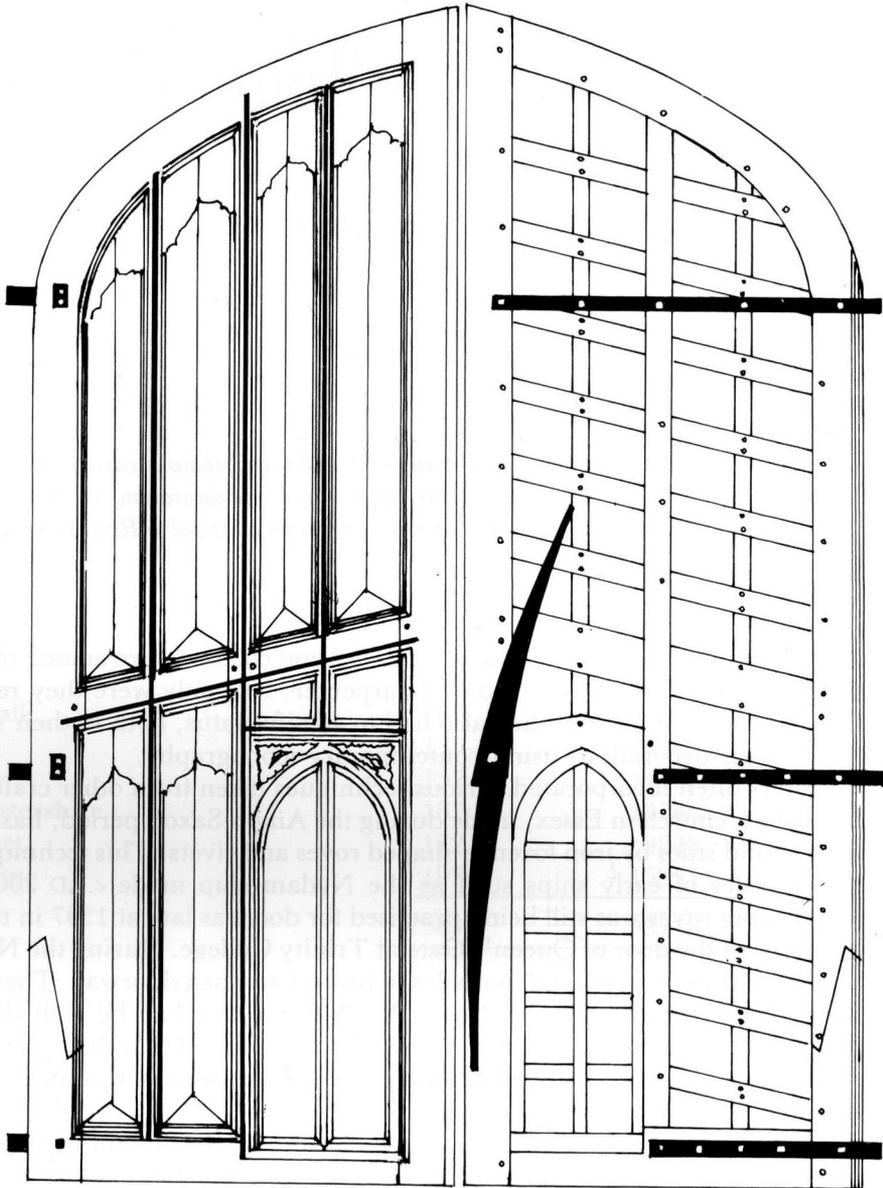


Fig. 1
 The Old Schools, formerly the old court of King's College.
 The door in the West range, opening on to Trinity Lane



Fig. 2
The Old Schools, assembly of the door

At Cambridge the seven doors studied show the transition between the medieval and Jacobean carpentry methods. All the doors studied are included in the building works recorded in contemporary accounts but only three are specifically mentioned. Certain researchers in the past have touched on the structure of doors in Cambridge, notably Professor Willis in his *Architectural History of the University of Cambridge* (1886).

THE OLD SCHOOLS: THE GATEHOUSE OPENING

The gateway on to Trinity Lane was not originally built as part of the University Old Schools but, until 1829, was part of the Old Court of King's College whose foundation stone was laid on 2 April 1441 by the founder himself, Henry VI.¹ The master carpenter for the work on the chapel, contracted for in December 1443, was Thomas Sturgeon of Elsenham, Essex, and it seems probable that he had already been working on the King's site since the start of the work two years before. He was given a commission to impress carpenters and other workmen and to obtain timber and carriage for the work on the college. Thomas Sturgeon was a guest of the Fellows, dining in hall on at least fourteen occasions and joining them at their table. By 1448 he was working on Queens' College.² The door appears to date from this phase of building though the whole frontage to Trinity Lane was restored—after it came into the ownership of the university—by Scott in 1864–7 and again by Pearson in 1890. The door, though repaired extensively, seems to preserve its form of the early 1440s.

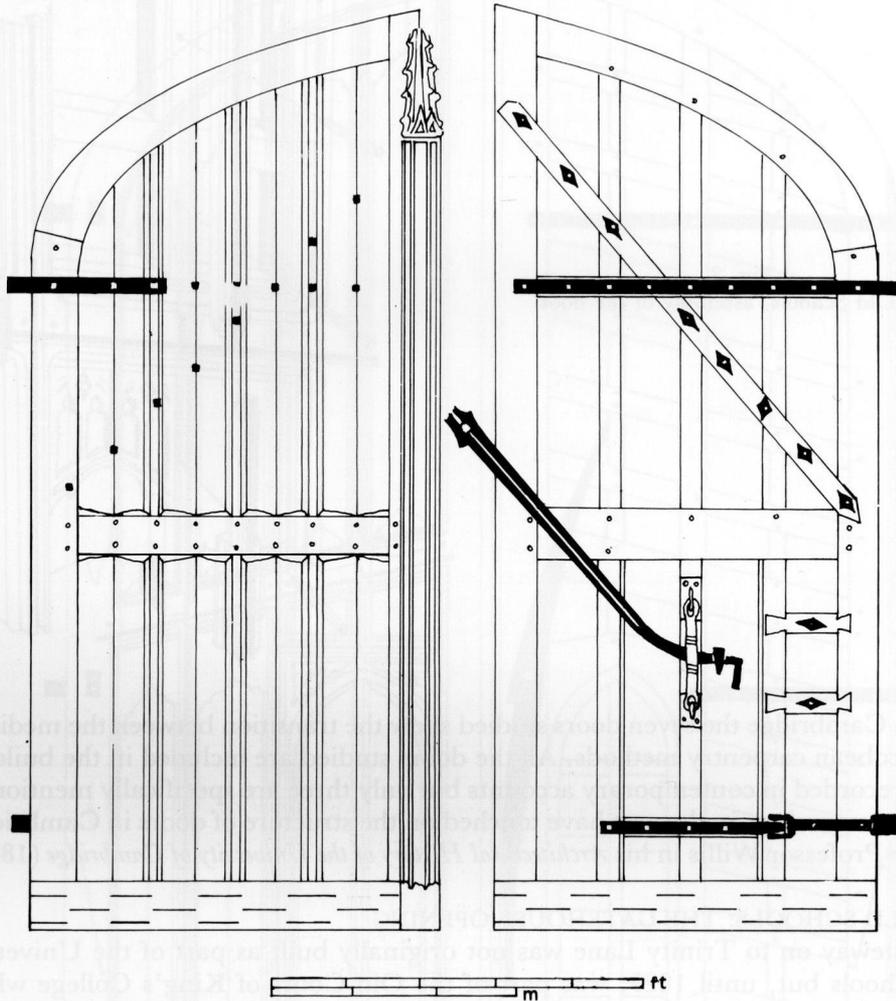


Fig. 3
Queens' College, the Great Gate, opening on to Queens' Lane

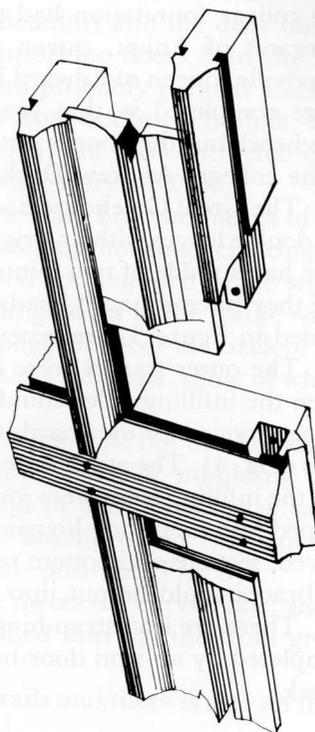


Fig. 4
Queens' College, assembly detail

The gatehouse door has double leaves with a small wicket. The left half is illustrated, showing the front and rear faces (Fig. 1). Construction is very complex. The two harrs are durns; they have a scarfed lower section, probably done when the doors were restored in the nineteenth century. The two meeting heads are counter-rebated to make an overlap shut. The basic frames only required five mortise-and-tenon joints in each leaf so as to make an adequate fit. The vertical central-stiles with two middle-rails were then mortised and tenoned (Fig. 2).

The portcullis-style ledges were halved and mortised and prepared for pegging. In Fig. 2 the final construction is shown. The whole frame has to be offered and marked for grooves to hold the boards, the carved panels, and the applied mouldings over the stiles (shown in Fig. 15b. A cut incision, dividing the two mouldings, is extremely rare).

The iron strap-hinges, three on each door-leaf are attached by threaded bolts and nuts and the door is secured by an iron door-band, turning from the head and locking into a hasp. Salzman writes 'I am inclined to think that the device of bolt-and-nut for such purposes was not introduced much before 1532'.³ If original these fixtures would seem to be a very early example.

QUEENS' COLLEGE: THE GREAT GATE, OPENING ON TO QUEENS' LANE

The college foundation had three stages, in 1446 by Andrew Docket; in 1448 by Margaret of Anjou, queen of Henry VI; and finally about 1465 by Elizabeth Woodville, queen of Edward IV. The foundation stone was laid in 1448 and the East range completed in that year.⁴ Thomas Sturgeon was the contractor for all the woodwork but the door is not specifically mentioned in his contract with the master of the college, Andrew Docket.^{5,6}

The Great Gatehouse door, which is just over twelve feet high and ten feet wide, has double leaves with an original wicket, now blocked (Fig. 3). The two door-frames have harrs made of two jointed pieces and are not true durns. The tops are curved and they have squared heads, each leaf having two rails. The bottom rails, shown shaded in figure 3, are renewed.

The outer frames were offered, clamped, marked and mortised-and-tenoned. Then the infilling stiles could be marked and tenoned into the middle rails and the frame grooved for the boards which have double hollow chamfers meeting at a central arris (Fig. 4). The stiles were also hollow-chamfered. When all was ready the heads and the infilling stiles were jointed and pegged to the middle rail, the moulded boards slipped into their long housings and the harrs assembled and pegged. Next, the top, curved, sections and bottom rails were fitted and pegged and finally the two diagonally-set braces could be put into their housings and nailed using roves on the back.

There are iron strap-hinges and one surviving hinge for the wicket. Closing was completed by an iron door-band set diagonally across the centre with its hasps and a lock.

CHRIST'S COLLEGE: THE DOOR ON TO ST ANDREW'S STREET

The present site was occupied in 1446 by God's House, incorporated in the new foundation of Christ's College whose charter was given by Lady Margaret Beaufort in 1505. The buildings in the north-west angle of the Entrance court, possibly including the gatehouse, are those of God's House and although the present decoration with the devices of Lady Margaret, dates from 1505-11, the gate may be part of the older structure.⁷ It has been cut at the bottom, reducing the overall height which may have been done to accommodate a raising of the pavement in the street outside or may be an adaptation to the level of the present arch from a much taller one.

The door is double leaved (Fig. 5), made of oak, fourteen feet high by eleven feet four inches wide. This door now has newer bottom rails (shaded in Fig. 5) which cut across the centre of the lowest row of linenfold panels. More recently a wicket door has been cut through (not shown on the drawings). The construction is more complex than that of the other doors. When it was made, with eight rails and twenty-four stiles for the matching pair of door-leaves, both vertical and horizontal pieces were moulded with quarter-round edges and double-square grooves in ready-made runs to a stock Cambridge pattern. These were mortised-and-tenoned, and put together fitting the curved top last. After clamping, the woodwork was augered and pegged. The linenfold panels were placed between the vertical and square frames and fixed by diagonal braces let into half-diminished housings cut into the rails before being nailed (Fig. 6). The linenfold panels are illustrated in figure 7. The upper iron strap-hinges are original, but the lower ones may be either new or re-used.

ST JOHN'S COLLEGE: THE GREAT GATE, OPENING ON TO TRINITY STREET

The college was founded in 1511 by Lady Margaret Beaufort and the door on the east side of the college is one of the finest of the Cambridge doors.⁸ In the late nineteenth century it was cut to make a new wicket and probably painted black as it is now. It was made by Thomas Loveday, a carpenter from Sudbury, Suffolk, who flourished in the early sixteenth century and died in 1536. He was contracted on 1 November 1516 to do much of the work at St John's for a fee of £100.⁹

Figure 8 shows the back and front of the same door-leaf. The two halves of the double door have a half-round closing tongue and matching housing, creating an overlapping shut. The frame has three rails, all mortised and tenoned to the stiles.

The eleven rear horizontal door-panels were let into grooves in the frame when it was untightened, after which it was fully closed and pegged. Over the back of the frame diagonal braces were then fitted and jointed by nailed side-laps, some of which have a square profile (Fig. 9).

The decoration of the front vertical boards is similar to linenfold but the mouldings run right through from end to end, having no shaped stops. The moulding was probably shaped by planing, after which the lower end of each board was sawn diagonally to create a feathered end in order to fit the sloping upper edges of the rails. All the front decorative work was then nailed into position (Fig. 9).

At the top of the door, where the straight head-stile meets the curved one, there is a straight lapped joint at the back, but the more refined mitre at the front gives an elegant appearance to the show face.

Two strap-hinges are nailed to the top and bottom rails and there is also an iron locking-band with hasps and a key-hole.

TRINITY COLLEGE: THE GREAT GATE

The foundation of Trinity College by Henry VIII in 1546 incorporated three older institutions, one of which was King's Hall which occupied the north-east corner of the present site where the Great Gate stands. King's Hall had been endowed by Edward II in 1317 and later by Edward III. The Great Gate is mentioned in an entry in the King's Hall accounts for 1432,¹⁰ and possibly survives as the portcullis-like frame, now forming the rear of the door. The main part of the present door is that contracted for in 1523 by William Buxton at a cost of £6. 13s. 4d. using timber from Great Chesterford in Essex.¹¹

The upper stonework of the gateway had been left incomplete until between 1528 and 1535 when Thomas Loveday, who had been working at St John's, finished the carpentry of the floors and roof.^{12,15}

The old portcullis frame, only visible from the back, is a separate entity from the decorative front. Its members are secured using huge nails entered from underneath the present panels and swaged over roves at the back. There are also redundant hinge recesses at each side, showing a different hinging arrangement from the present one. This portcullis also appears to have been made to fit a broader, shorter, gateway (Figs 10 and 11). It has been reduced in width at the centre when new heads were pegged on each leaf. The bottom has also been lengthened, the added rail being held by iron straps.

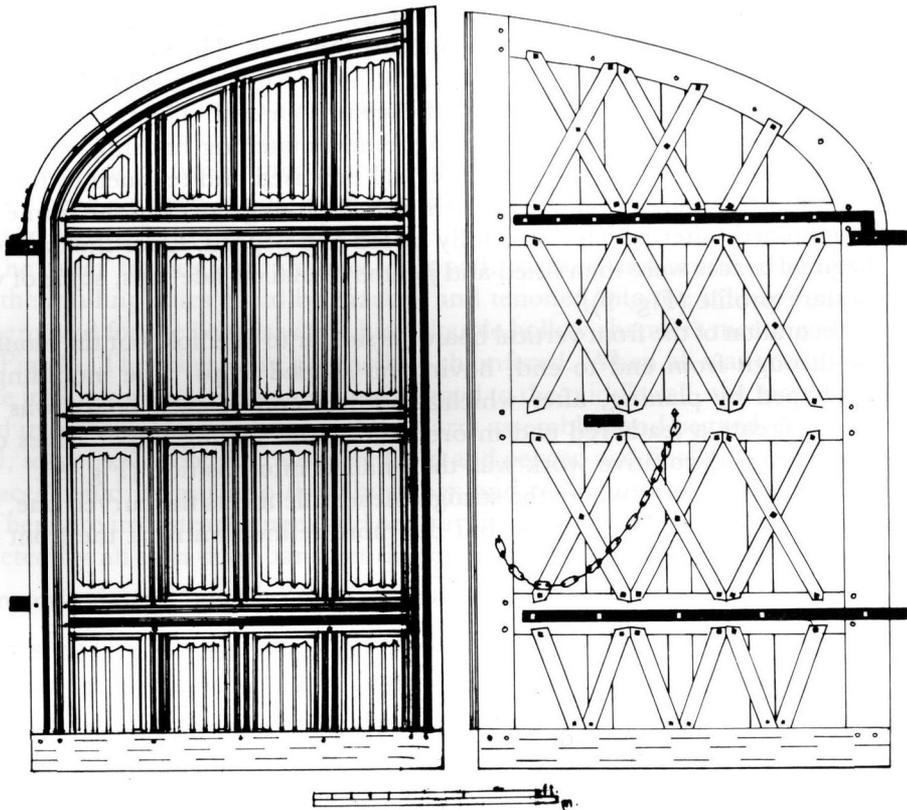


Fig. 5
Christ's College, the door on to St Andrew's Street

Fig. 6
Christ's College, details of the door frame

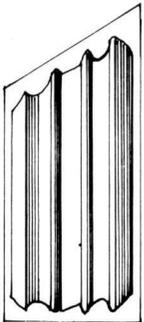
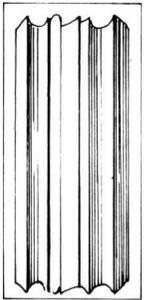
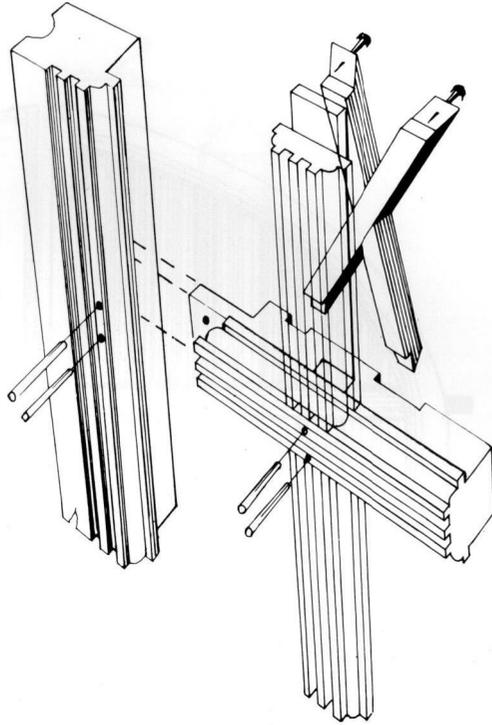


Fig. 7
Christ's College, details of the linfold panels

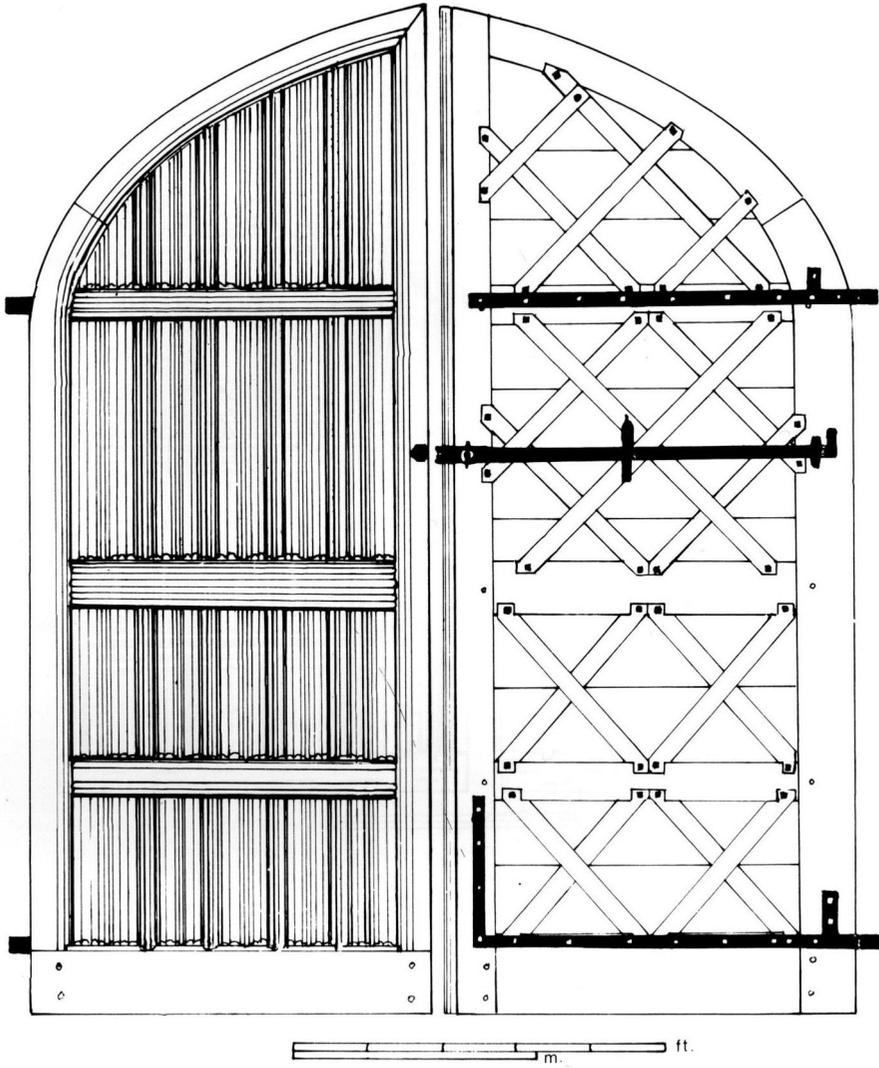


Fig. 8
St John's College, the Great Gate, opening on to Trinity Street

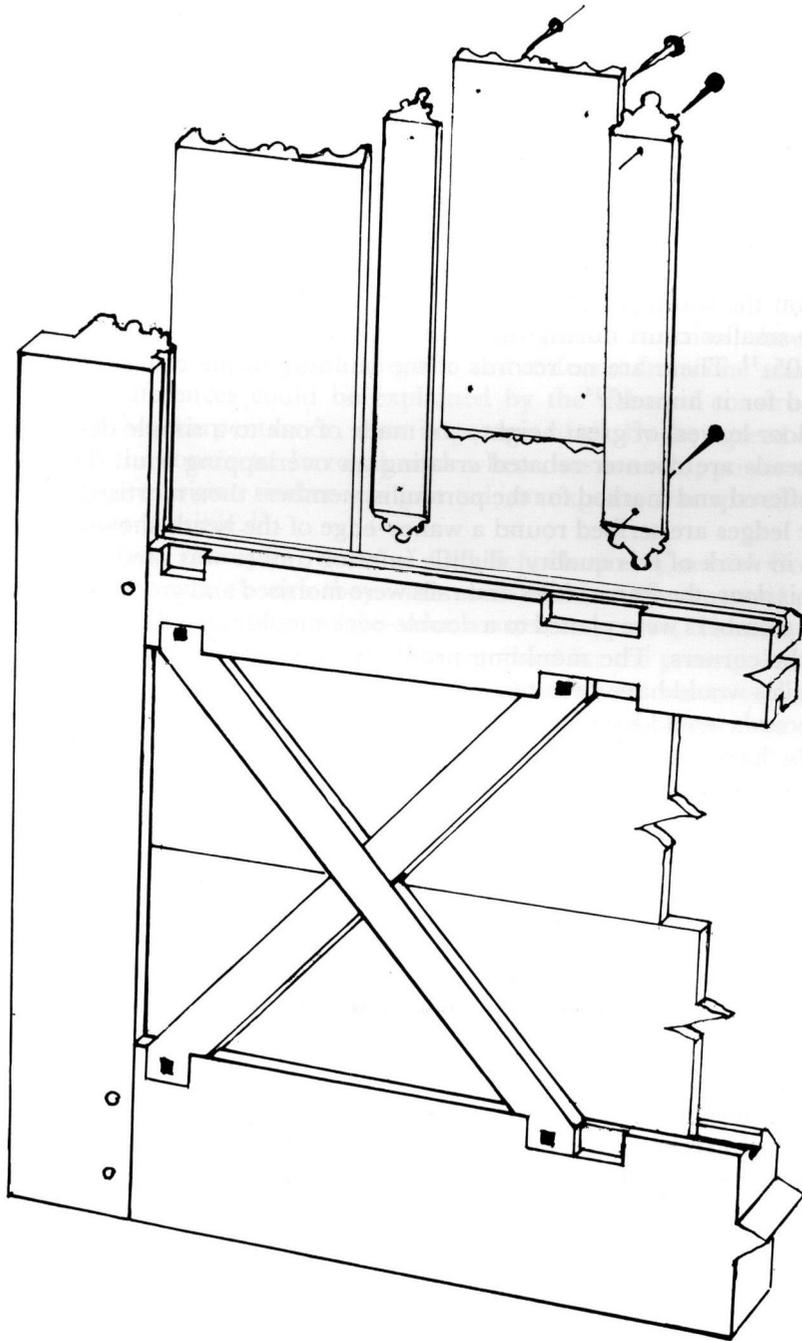


Fig. 9
St John's College, construction details of the door

From the front, the door is of the characteristic double leaf form with very sumptuous decoration with a separate pedestrian gateway to the north. In the 1520s, the old portcullis frame was clad with linenfold panels let into grooves in new moulded stiles and rails and subsequently nailed through from the front. The carving of the stops on the linenfold mouldings is symmetrical and unlike the apparently similar examples of St John's and Christ's.

There are three strap-hinges, bolted and nailed, and a door-band turning on a bolt through the middle of one head; it also has a hasp, lock and a keyhole.

TRINITY COLLEGE: QUEENS' GATE OPENING ON TO TRINITY LANE

This gate on the south range of Great Court was built as part of the enlarging of the former smaller court during the mastership of Dr Thomas Nevile in the years 1597 to 1605.¹³ There are no records of the building in the college accounts as Dr Nevile paid for it himself.¹⁴

The door leaves, of great height, are made of oak to a simple design (Fig. 12). The two heads are counter-rebated creating an overlapping shut. The frame was probably offered and marked for the portcullis members then mortised and tenoned. Two lower ledges are scribed round a waney-edge of the head, showing that by this date, even in work of this quality, slightly inferior timber was used where it did not show. In this door, the frame, stiles and rails were mortised and grooved for the boards. The frame members were planed to a double-ogee moulding and finished by masons' mitres at the corners. The moulding profile is shown in Figure 15f.

The stiles would have been tenoned into the middle rails and pegged. Then the moulded boards would have been slipped into their housings. After this the bottom rails, heads, harrs, and scarfed, curved tops would be fitted in that order. Finally the whole frame would have been pegged.

The three strap-hinges are bolted and nailed, five nails being set between each bolt. There is also a straight iron locking-bar, or door-band, pivoted on a bolt with a hasp, lock and keyhole. The right-hand leaf has a contemporary wicket carefully concealed on the outside, being made without its own outer frame thus enabling it to blend in with the main door panels.

KING'S COLLEGE CHAPEL: THE WEST DOOR

Work on the chapel for the foundation of Henry VI began in 1446 and work proceeded from the eastern end. The carpentry of the western end was finished by Richard Russell, carpenter from 1509 to 1515.¹⁶ The west door, however, was constructed by Henry Man, carpenter in 1614–15, at a cost of £22. 6s. 8d.¹⁷ This door has double leaves of oak (Fig. 13). The inner and outer faces of the north leaf are shown. The stone opening and mouldings were finished before 1509 and the door was constructed long after that date to a totally Jacobean design.

With such a large door a good fit of the outer members was imperative before complete construction was continued. The whole outer frame—comprising the two harrs having scarfed curved pieces together with the shut 'heads'—was probably offered into the stone doorway. Then the bottom rails and the middle rails were cramped, marked, mortised-and-tenoned but not pegged. The other rails could then be mortised-and-tenoned, set at right angles after which the vertical stiles could be tenoned into

the rails. Next, all the members were rebated on their insides and pegged together as a square frame without the half-round top. The oblong panels could then be inserted with their front mouldings (Fig. 14). They were mitred with the stiles and rails and finished with round bosses. The upper stiles and rounded top were mortised-and-tenoned and the carved tympanum, consisting of five boards, retained by the moulding of the outer curved frame.

The iron strap-hinges are original, as is the doorband, and detailed in the bill of 1615: 'Solut Rule pro le ironwork of the new west door in ye Chappell vt per billam patet . . . vj Li xj s j d.'¹⁸

DISCUSSION

The seven doors, all of a similar size and fulfilling a similar function, show a variety of design solutions and are all quite singular and different from one another. The reasons for the differences could be explained by the dates of construction, the idiosyncracies of their carpenters or, most important of all, by the agreed cost which is often stated in the contracts. In royal work where, we are told, power to impress workmen and to requisition timber was granted, no expense was spared to achieve the grandest effect possible.¹⁹

The two earliest examples, those of Old Schools and Queens' College, are remarkably different even though they were made within a few years of each other and probably under the direction of the same master carpenter, Thomas Sturgeon. The Old Schools door, as we have seen, was intended for the principal entry to the King's own foundation and is the most superior of the seven examples described in this paper in that all the members are jointed at an angle to one another, a very time-consuming and therefore costly method. The resulting strength and the elaborate ornamentation on the front make this door quite distinct from the Queens' College door, which is plainer by comparison. The structure at Queens' College is extremely functional, however, and shows a very efficient, if less expensive, solution, particularly with regard to racking which is prevented by a single diagonal brace passing the intermediate vertical stiles.

The two X-braced examples, at Christ's College and St John's show distinct similarities, perhaps to be expected of sister foundations. The rear frames of these doors show a compromise between the impenetrable barrier of a portcullis and the increased rigidity imparted by multiple triangulation. The details of the linenfold panels are however markedly different, the St John's example, with simple-planed channels, being much cheaper to produce than the fully-stopped, asymmetrical pattern at Christ's.

The Trinity doors, though widely different in date and obviously made by carpenters separated by at least two generations, show very similar structures retaining the archaic technique of the portcullis held to the front members with bolts and roves. The treatment of the decoration of the front reveals the fashion of pre- and post-Renaissance detailing.

In the West Door of King's College Chapel, together with matching doors which open to north and south of the Ante-chapel, we see the subordination of function to considerations of architectural fashion and the emergence of a fully-framed and panelled door with post-medieval mouldings and exotic decoration in the tympanum. Strength

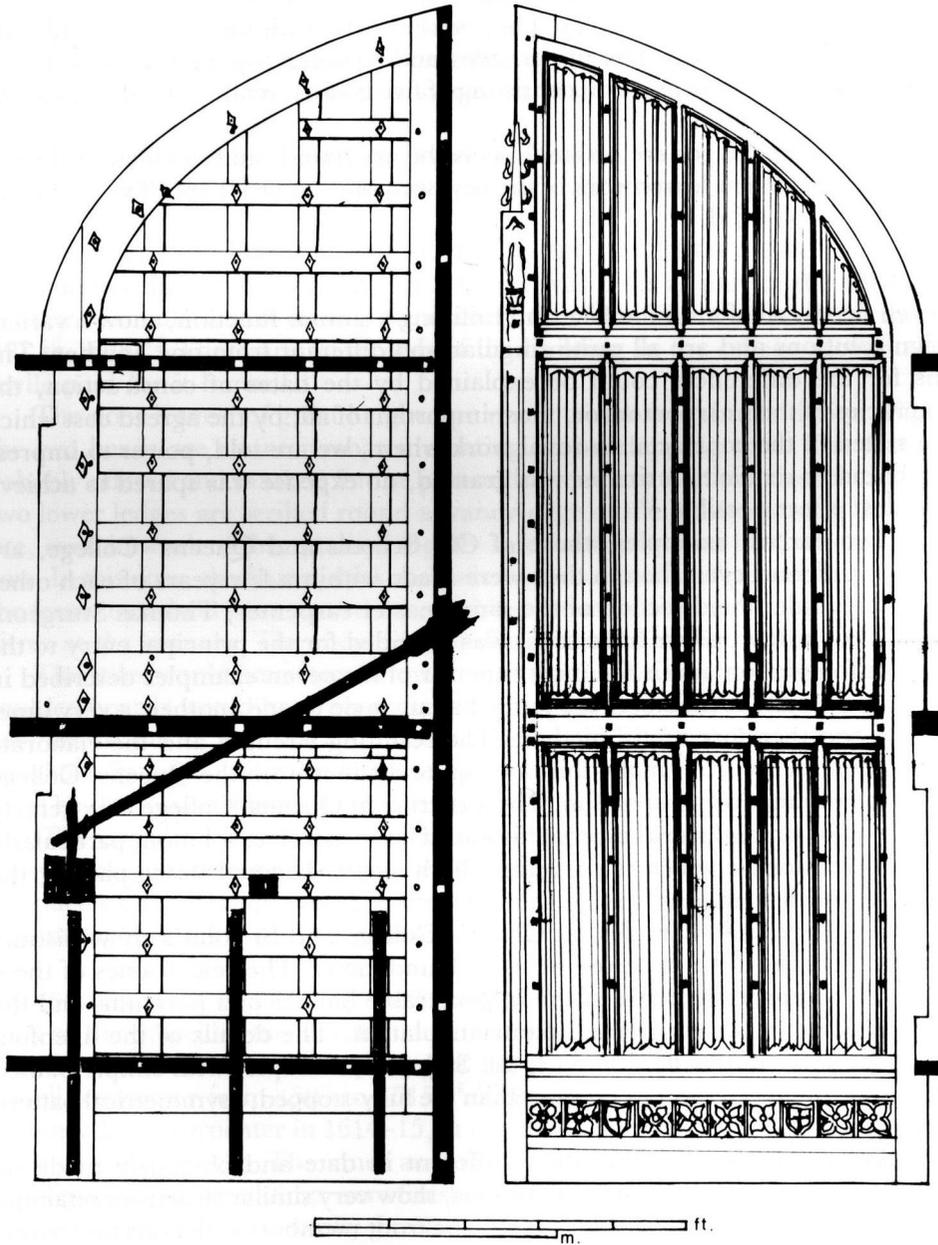


Fig. 10
Trinity College, the Great Gate

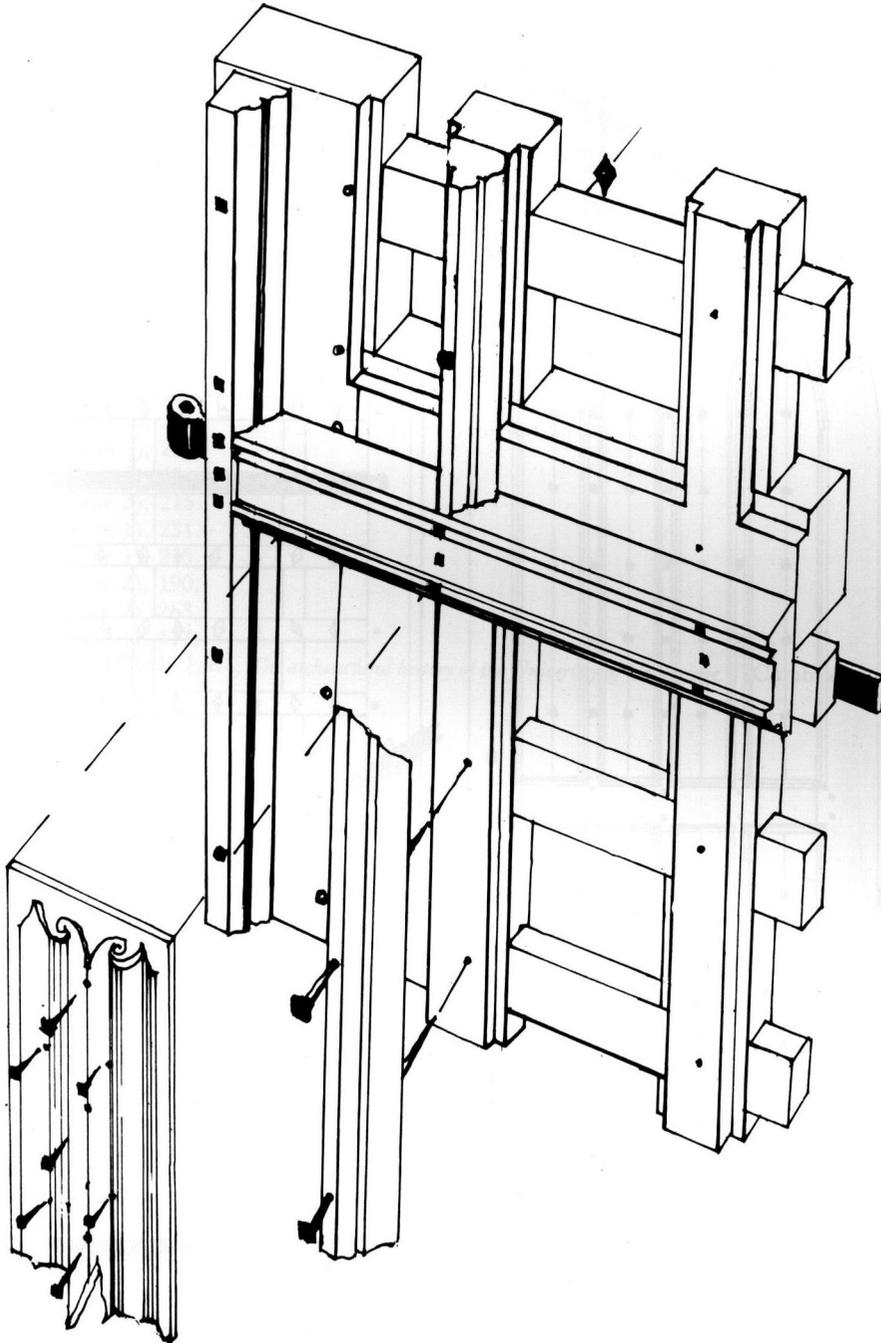


Fig. 11
Trinity College, Great Gate, construction details

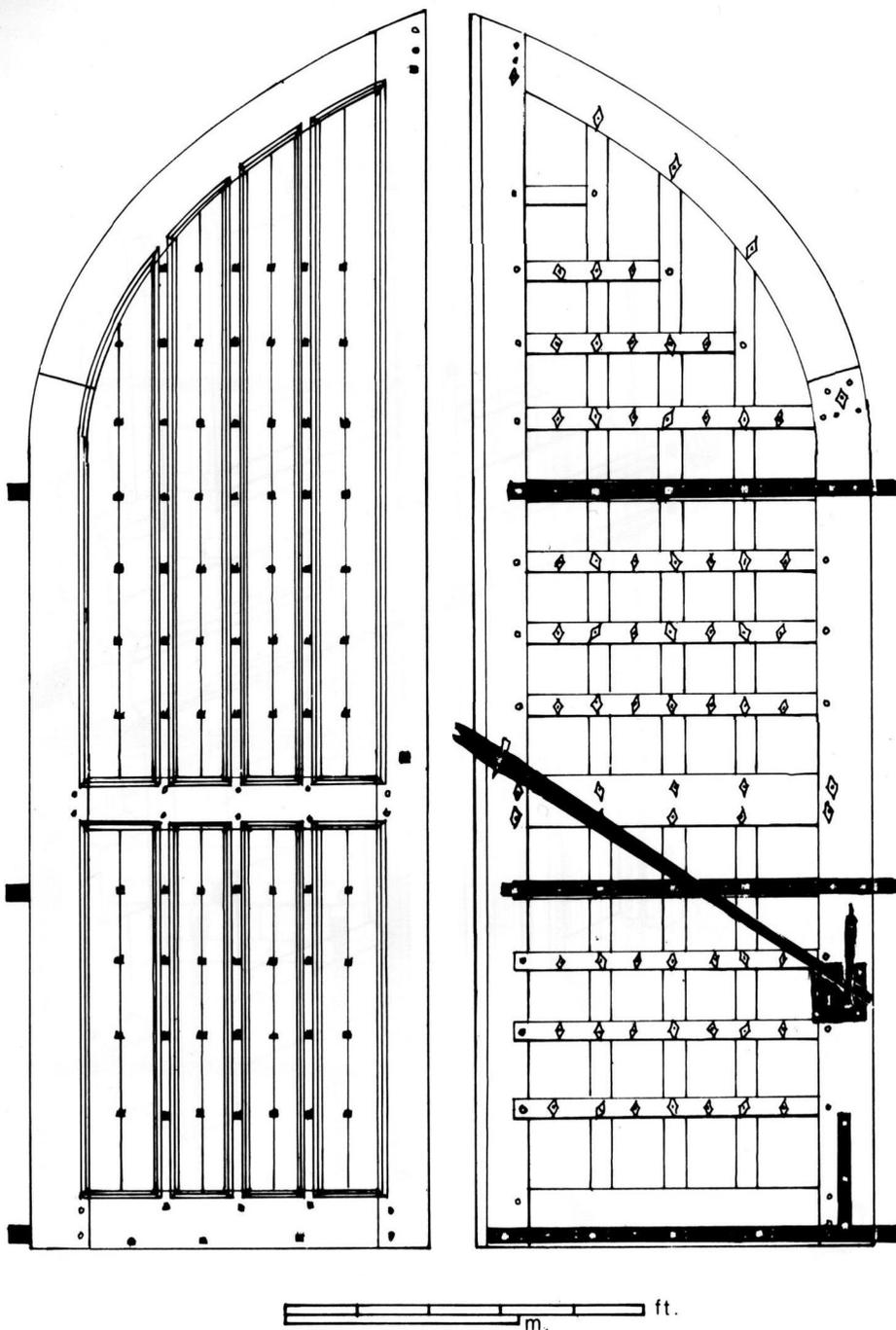


Fig. 12
Trinity College, Queens' Gate, opening on to Trinity Lane

though is ensured by the gigantic scale of the members visible on the back but disguised on the front by the multiple mouldings round each panel. The effect is that of a piece of furniture rather than a military installation. Cost here is entirely secondary to the effect to be achieved.

NOTES

1. Royal Commission on the Historical Monuments of England, *City of Cambridge, i*, (London, 1959) 17.
2. Harvey, J., *English Medieval Architects* (Gloucester, 1984), 289.
3. Salzman, L.F., *Building in England down to 1540* (Oxford, 1952), 309.
4. Op. cit. (note 1), 167-8.
5. Op. cit. (note 3), 528-9.
6. Op. cit. (note 2), 290.
7. Op. cit. (note 1), 25.
8. Op. cit. (note 1), 189.
9. Op. cit. (note 3), 571.
10. Op. cit. (note 3), 297.
11. Op. cit. (note 2), 43.
12. Op. cit. (note 3), 215.
13. Op. cit. (note 1), 231.
14. Op. cit. (note 1), 213.
15. Op. cit. (note 2), 190.
16. Op. cit. (note 2), 263.
17. Op. cit. (note 1), 117.
18. Willis, R. and Clark, J.W., *The architectural history of the University of Cambridge, i* (Cambridge, 1886), 529.
19. Op. cit. (note 2), 289.

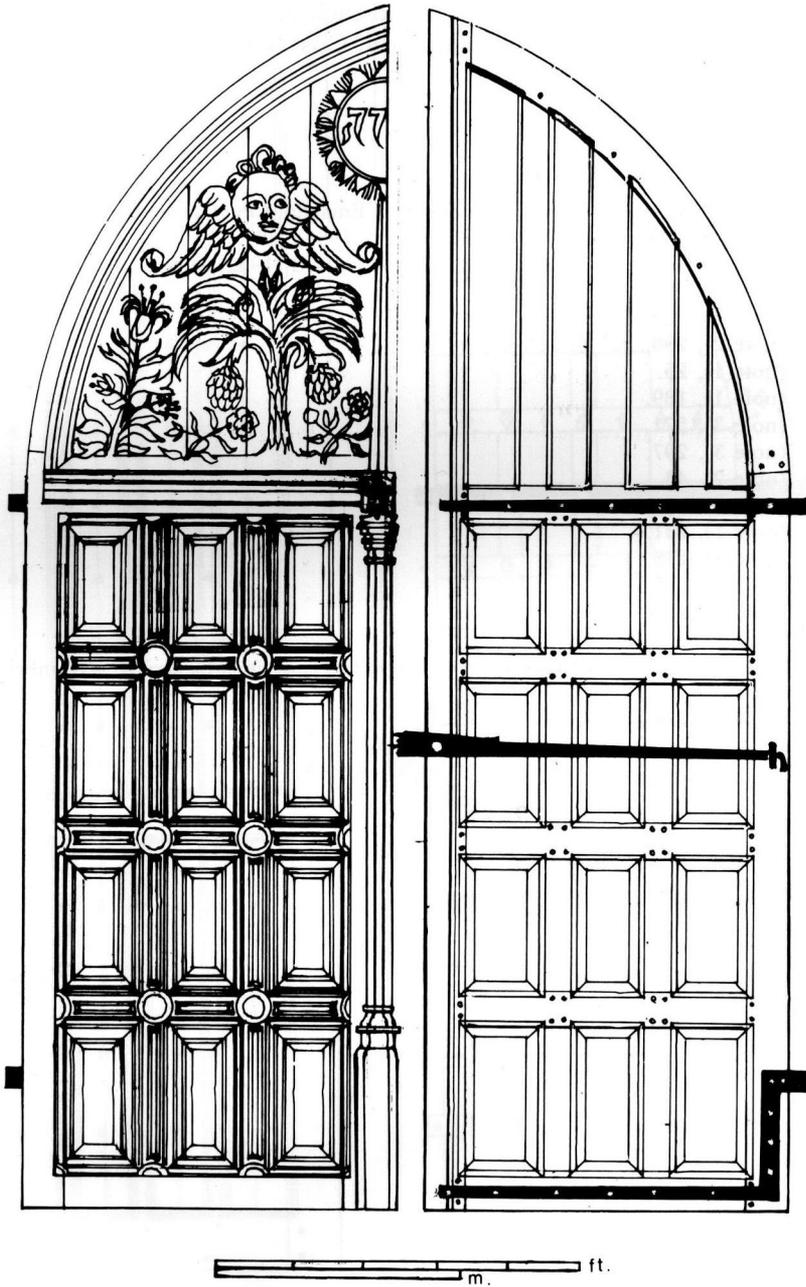


Fig. 13
King's College Chapel, the West Door

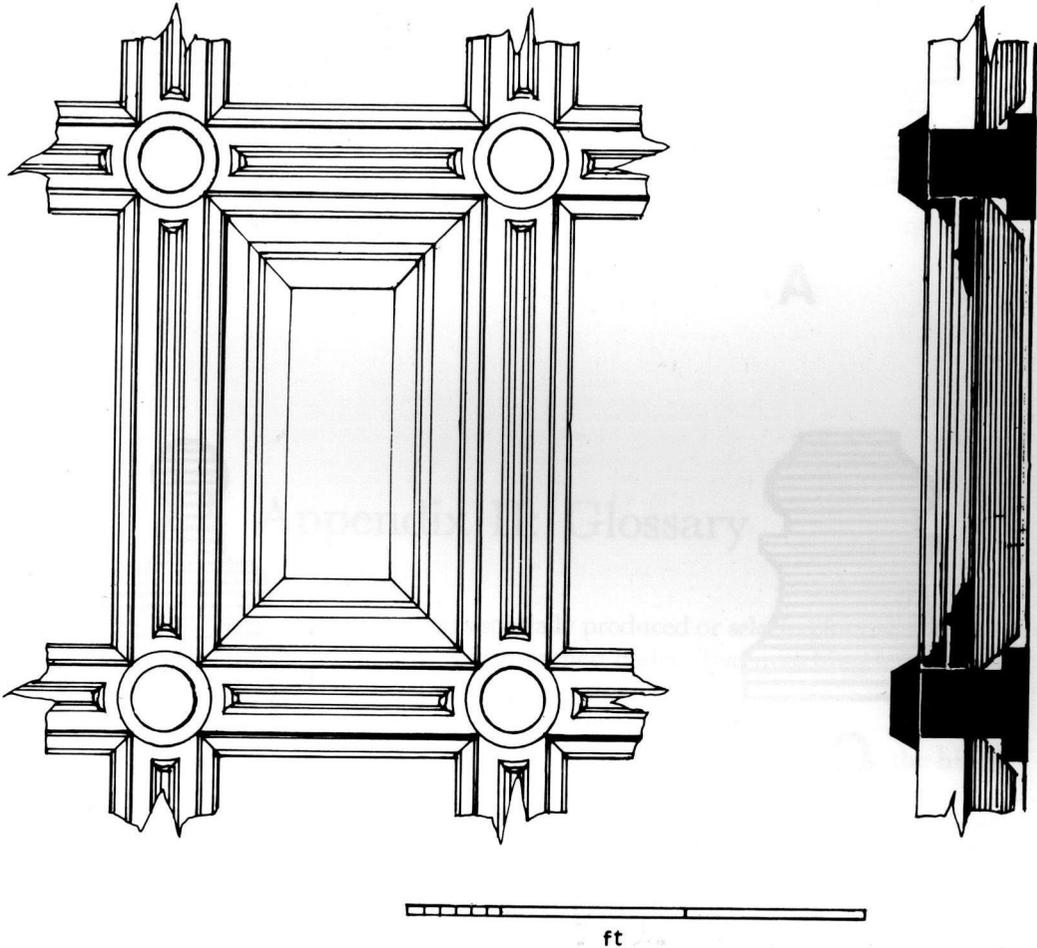


Fig. 14
King's College Chapel, the West Door, frame and panel detail

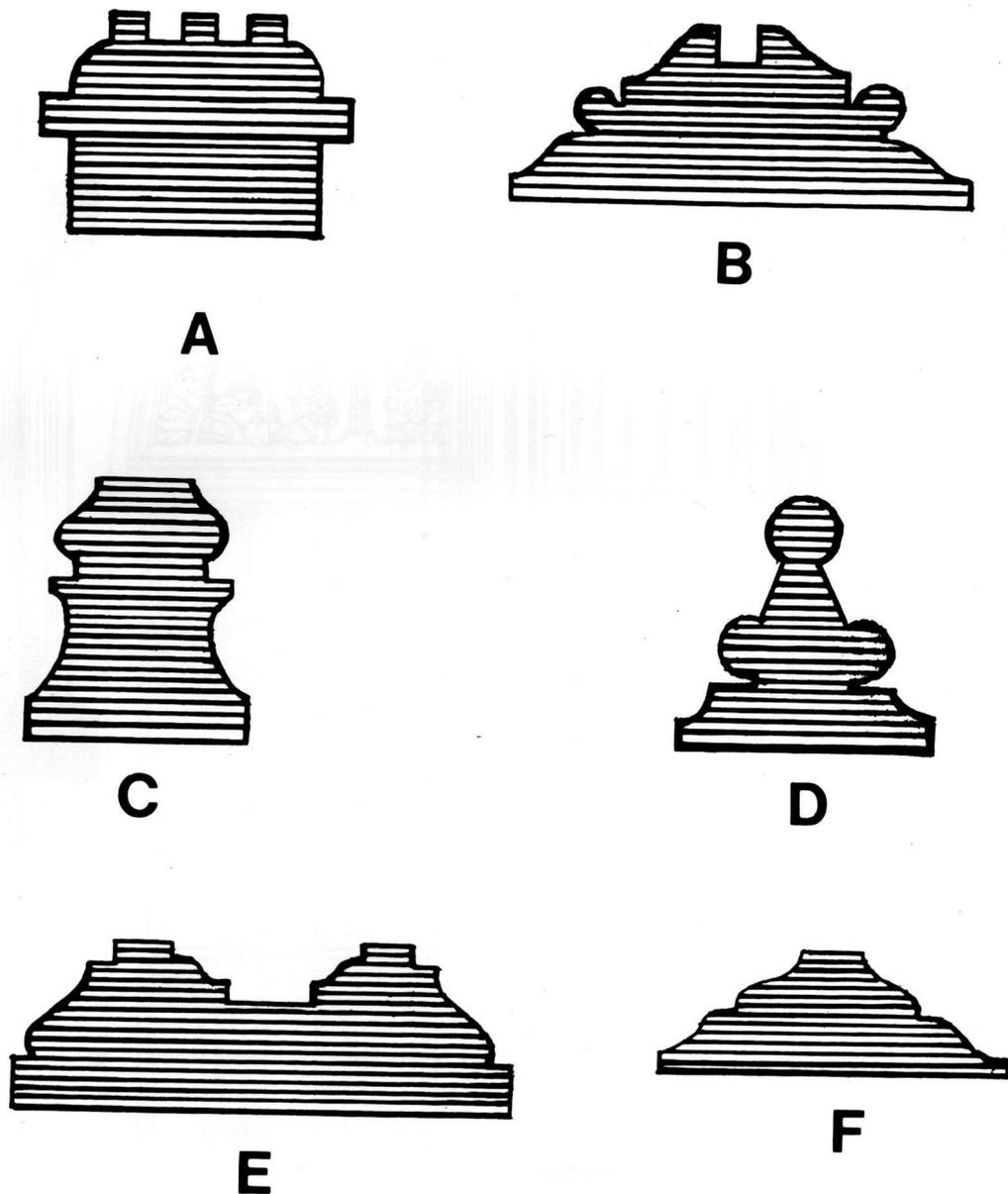


Fig. 15

- (a) Christ's College, the front three middle stiles
- (b) The Old Schools, the front stiles
- (c) Trinity College, the Great Gate, the front stiles
- (d) St John's College, stiles
- (e) King's College Chapel, front frame members
- (f) Trinity College, Queen's Gate, stiles

Appendix I: Chronology

DATE	DOOR	CARPENTER
1620	King's College Chapel	Man
1580	Trinity College, Queen's Gate	
1520	Trinity College, Great Gate	Buxton
1500	St John's College	Loveday
1480	Christ's College	
1460	Queens' College	? Sturgeon
1440	The Old Schools	? Sturgeon

Appendix II: Glossary

DURNS	Timbers specially produced or selected for use as curved members in arched doors. Two matching halves were often sawn from the same tree.
HARR	The vertical edge timber of a door nearest the hinge.
HEAD	The closing edge of a door, furthest from the hinges.
LEDGE	A secondary rail across the back of a door to hold the vertical boards
RAIL	A primary, horizontal member of a door, top rail, middle rail, bottom rail.
REBATE OR RABBET	A step-shaped channel or groove cut along the edge or face of a piece of wood to receive another.
STILE	A vertical member in a framed structure.
WALES	The principal planks extending along a ship's sides.
WICKET	A small door or gate for pedestrians set within or beside a large carriage way door.

Appendix I: Chronology



DOOR
 Queen's College Chapel
 Queen's Gate
 Great Gate



DATE
 1650
 1580
 1520
 1480
 1460
 1440

A



DATE
 1650
 1580
 1520
 1480
 1460
 1440

D



Timber specially produced or selected for use as curved members in arched door. Two structural halves often sawn from the same tree.

C

The vertical edge timber of a door near the hinge.
 The closing edge of a door farther from the hinge.
 A secondary rail across the back of a door to hold the vertical boards.



A primary horizontal member in a door, with a middle rail between the
 A step-shaped channel or groove cut along the edge or face of a piece of wood to receive another

E

A vertical member in a framed structure.
 The principal plank extending along a ship's side.
 A small door or gate for pedestrians set within or beside a larger carriage door.

- (a) Christ's College, the Great Gate, the Great Gate
- (b) Trinity College, the Great Gate, the Great Gate
- (c) Trinity College, the Great Gate, the Great Gate
- (d) Trinity College, the Great Gate, the Great Gate
- (e) Trinity College, the Great Gate, the Great Gate
- (f) Trinity College, the Great Gate, the Great Gate

Appendix II: Glossary

WHEEL OR BARRETT
 RIBS
 WALLS
 WORKET