THE ROOF OF THE HALL OF THE MIDDLE TEMPLE AND ITS REPAIRS.

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IN common with other heavily-timbered roofs of great age, the roof of the Hall of the Middle Temple has suffered considerably by the ravages of the "Death-watch" beetle.

These ravages had proceeded so far as to necessitate a minute inspection of the whole of the roof and a consequent renewal of decayed parts with a strengthening of others. The repairs were successfully completed in 1924, by Messrs. Dove Bros. of Islington, under the direction of Sir Aston Webb.

As regards the "Death watch" beetle (xestobium tessellatum) Miss G. Lister, F.L.S., writes that the tapping sound made by the male on striking his head rapidly against the wood on which he stands is really a love-call to his mate, but has given rise to many superstitious beliefs. As Professor A. J. Thomson narrates, adult death-watch beetles eat little, but their grubs eat much and their diet consists of dry wood. At the entrance to the grub's digestive canal is a colony of yeast plants, and these plants act upon the sawdust and ferment it into sugar and alcohol so that it becomes an easily digested food. The yeast is obtained from a drop of fluid expressed by the mother-beetle upon the rough shell of the egg, and the grub in eating its way out of the shell swallows some of the yeast which is indispensible for its digestion.

The older Hall for which the present structure was substituted was upon a different site and lay between Elm Court and Pump Court with its west end abutting upon Middle Temple Lane. Possibly the older Hall dated from the time

of the Knights Templars, for from an inventory of 1307, which was made when a dispossession of the Knights-Templar of their property in the Temple was in contemplation, it appears that two Halls were in existence. One of these may be identified either with the Hall of the Inner Temple, which was replaced in 1868-1870 by the present Hall of the Inner Temple, or with a previous Hall on the same site, and the other with the older Hall of the Middle Temple which was destroyed about 1639. A portion of the foundations of this older Hall was uncovered during the repair of a well in 1735.

The present Middle Temple Hall was in process of building in 1562 when Plowden was Treasurer (Williamson's *The Temple*, London, 1924, p. 229). Judging by the presence of Plowden's name and arms with the date 1573 in the South oriel of the Hall, this date, 1573, may be taken as the year when Plowden's work of building and fitting up the Hall was finished. The date, 1570, which appears prominently above the minstrels' gallery at the east end of the Hall suggests, however, an opening of the Hall in that year for the use of the members of the Society (*ibid.* 230).

In the years 1658-9 the roof was tiled, and there are entries, year by year, of repair work to the roof. In 1670 in the Treasurer's Accounts, Book 75, the following appears:—

> Making good ye decay at ye upper end of ye Hall and new working upon some parts of ye Bay Window at the end of ye Hall and scaffolding and securing 3 pendants in ye Hall to keepe ye roofe from flying further out." (Williamson's *The Temple*, p. 522).

Further repairs are mentioned by Mr. Williamson. Thus, repairs in 1673 and 1674 proving unsuccessful, it was ordered in 1676 that substantial repairs should be executed at the south bay window and the south-west corner of the Hall.

> " From details in the accounts, however, it is manifest that the Hall continued to be under repair for some years after the summer of 1676. Mending both sides of the roof is repeatedly mentioned . . . . . a 'new girder' was

put in in 1693 and in 1698 workmen were employed in 'new ripping and repairing the Hall throughout.'"

Mr. Williamson adds:—

"The tradition that Wren was consulted at the time finds no support in the records of the Society; on the contrary, the committee [appointed in 1676 to consider the condition of the Hall] were directed to desire the assistance of Mr. Barker."

As regards the lantern or louvre, which is so prominent a feature upon the outside of the Hall at the ridge of the roof and which gave vent to the smoke from the central fire-place or which may simply have carried on the tradition of a roof-vent, it gave place in 1732 to a new cupola with a vane. This in its turn was displaced in favour of the present louvre by Hakewill (Bellot's *The Inner and Middle Temple*, p. 282).

It seems almost incredible that in the sixteenth and later centuries the practice should have been retained of an open fire-place in a new building from which the smoke, fumes, and gases passed away through the roof, to the extreme discomfort, it would be imagined, of those present in the Hall. Yet Harrison writing his Description of England in Hollinshed's *Chronicles of England* laments the tendency of his times to provide chimneys. He says:—

"Now have we manie chimneys and yet our tenderlings complain of rheums, catarhs and poses. Then had we none but reredosses and our heads did never ache. For as the smoke in those days was supposed to be a sufficient hardning for the timber of the house, so it was reputed a far better medicine to keepe the good man and his familie from the quacke or pose, wherewith as then verie few were oft acquainted."

In *The Gentleman's Magazine* for 1812 (Vol. LXXXII, p. 342) there is the statement in a description of the Hall:—"The hearth for fire, and lanthern over it, still in preservation and use." From this it might be thought that in 1812 there was still the open hearth, but the passage is ambiguous and

may merely mean that the fireplace was in the middle of the Hall and was in use, nothing being said as to the necessary flues. A view of the interior of the Hall in 1800 shows a central fireplace. However this all may be it is clear that the repair of the Hall with its roof was a constant source of anxiety.

Coming now to the repairs which were concluded in 1924, by the courtesy of Mr. Fred. L. Dove, member of our Council, the present writer was enabled in Mr. Dove's company to ascend the scaffolding within the Hall and to inspect at close quarters the beams which support the roof. It was obvious that there had been extensive repairs from time to time. Thus, the beams had been reinforced and strengthened at their ends—an operation which must have necessitated the beams being put out of action—whether one at a time or by a stripping of the whole roof is not known. During the same operations, a portion of the western wall of the Hall must have been removed in order to reinforce the adjacent beams. It may be noted here that an external brickwork casing was applied at some time or another to the western wall, the original wall being that in which the present rose-window appears. It may also be noticed that the north-west angle of the walling of the Hall is out of the perpendicular. The Hall is *not* open to the ridge. Below the ridge of the roof, a platform runs from end to end of a width, say, of six or seven feet, the extreme height of the space being possibly nine feet. During some previous repairs, simple lath and plaster had been laid on the battens which supported the slates above. Ornamental, turned, vertical posts are ranged round the whole of the roof below the platform. As each post is seen to have been raised by wooden blocks as much as 4 inches, some mistake seems to have been made originally as to the proper height of the posts; or it may be that they came from some other building. Much of the woodwork was 12 inches square in size. It was noticed that many repairs had been executed in fir. The lantern and its lining was a shoddy

affair, common deal having been much used in its reconstruction. It now has been made to rest on a hanging frame of iron. The foreman of the works said that a roll of lead bore the date 1853 with a man's name.

The southern wall was stated to have bulged in the middle by some inches and the northern wall to a lesser extent. The woodwork of the roof was being treated with a composition into which spirit entered but no live beetles had been discovered, the beetles having succumbed to a treatment with the spirit composition not long ago.

Much ironwork was seen to have been introduced for strengthening purposes and for renewals. In addition many iron plates had been added at an early date in the life of the structure for similar reasons.

There is an internal " Run " at each side, adjacent to the eaves. It is large enough for a man easily to crawl through. The " Run " is behind the line of dwarf vertical posts and is shut out from the Hall below by boards behind the posts.

Details of the construction of the roof and of the repairs which have been done are kindly furnished by Mr. Frederick L. Dove as follows:—

The roof is constructed on the principle known as the " Double Hammer-Beam." This system makes a most picturesque roof and allows a building of considerable width to be covered in as no tie-beam is required. The principal rafters are 38 ft. long, 17 inches by 12 inches at the base, tapering to 15 inches by 12 inches at the top. They now have a sag in them of 5 inches to 6 inches brought about from various causes, one being the spreading of the walls, the south wall being 2 inches out of plumb in the centre of the Hall. The Principals at the top tenon into the Crown-Post which is 12 inches by 12 inches. This post runs down and tenons into the Collar-Beam. The upper Collar-Beam is in two parts and tenons into this Crown-Post. The spread of the walls caused the free end of the Hammer-Beams to drop, some of them as much as 4 inches.

The lower Hammer-Beams are 21 inches by 12 inches. These have been reinforced at some period by timbers of about 12 inches by 8 inches placed on both sides and bolted through. They are strutted down on to the wall plate by short struts bolted through the principal rafter. This repair is attributed to Sir Christopher Wren. From all appearance, there has been no further movement since. Special interest is attached to this reinforcement as these timbers are fixed with 1-inch threaded bolts and nuts, probably some of the earliest bolts of this size, while in other parts of the roof much smaller bolts with the gib and cotter have been found. The " firring up " of the roof on the last occasion was done with fir timber on top of the oak common rafters. The Collar-Beams are 15 inches by 12 inches and have two $1\frac{1}{2}$ inch tenons morticed into the principal rafter to a depth of 8 inches, the joints being secured by fine wood pins. It seems practically certain that there was little or no ironwork in the roof when it was first constructed. There are five purlins on each side of the roof, two of which are 13 inches by 7 inches and three 10 inches by 6 inches. The common rafters tenon into the larger ones and lie on the smaller, thus allowing for the common rafter to be in three lengths. The whole of the inside of the roof is lined with $\frac{3}{8}$th inch oak-boarding, a great portion of which is carried on fir-studding. This points to its having been introduced at a later date, as behind this the common rafters have been lathed and plastered. This boarding completely blots out all the common rafters and purlins. The walls of the building are really a collection of piers between the windows. Upon these piers are three oak trimmers about 10 inches by 9 inches. Packed up from them is the main plate varying in size but generally about 12 inches by 6 inches. On this, immediately over the piers, rest the Lower Hammers, which are supported by huge shaped ribs that tail down on to the stone corbels. The turned columns on the Upper Hammers and the Collar-Beam are purely ornamental and were probably put up when

the roof was lined with the oak boarding. This view is borne out by the fact that they rest on independent blocks of varying height. Recently the whole roof has been again overhauled and several of the timbers which have become defective and unsafe (brought about by the ravages of the 'Death-watch' beetle) have been renewed and steel plates and fastenings have been introduced. The lantern, which was by no means in a safe condition, has had the seriously defective parts renewed and been made secure, at the same time precautions have been taken against further attack of the beetle. The whole roof has been treated with an anti-beetle dressing directed by Professor Lefroy."

From the bolts, nuts, and cotters which were seen to have been employed in the repair of the roof, it was hoped that some dates could have been assigned to the repairing operations.

On this point, Mr. Rhys Jenkins, M.Inst.M.E., late of H.M. Patent Office, writing from Berkshire, informed the present compiler that "the presence or absence of bolts and nuts in a structure cannot be taken as a criterion of date. Bolts and nuts were certainly in use in this country in the 17th century, they were known still earlier, but can have been used to a limited extent only—indeed they did not come into anything like general use until the early part of last century, and to-day I fancy that if I went to our village smith and asked him to thread and make a nut for the end of a $1\frac{1}{2}$-inch rod he would not be able to do it, and would suggest a cotter. Screw plates and taps were in use in England before 1700, but not, I take it, by ordinary smiths. Before the introduction of screwplates and dies (and subsequently of large screws) the thread was, as Mr. Huggett says, first cut by hand on the bolt. I think too that I have heard of the nut being formed in the way he mentions, but for vice-screws and press-screws, the nut was cast in brass on the screw. As an illustration of the inability of smiths in general to make large screws and nuts,

I may say that in 1775-1800, in connection with the Boulton and Watt pumping engines, the wrought iron work was invariably made at the place where the engine was to be erected; but the ends of screws were prepared at Soho and sent down ready for welding on."

Mr. Huggett, the foreman of Mr. Dove for the repair-work, thought that the wing-nut was much later than the square nut. He had always understood that in the early days of the manufacturer, the bolt was first threaded and the nut then bored and afterwards heated and twisted on to the bolt to thread it. Some of the nuts in the building had the appearance of being so treated, one face being swelled.

Although doubts are expressed by competent authorities as to the appropriateness of the methods adopted for repairing the roof, it is to be hoped that the measures which have now been taken will render unnecessary for a long period any but the slightest attention being given to this most splendid specimen of Elizabeth roofing.