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# SOCIETY OF ANTIQUARIES

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## THE DEATH-WATCH BEETLE

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### I

#### INTRODUCTION

WIDESPREAD alarm has been aroused in recent years by the discovery that the ravages of the Death-Watch beetle are far more extensive than was suspected. Not only in the grandiose roof of Westminster Hall, but at Hampton Court, Gray's Inn, Bath Abbey, St. Paul's, and elsewhere, generations of this mischievous animal have been devouring the roof-trees of ancient structures, reproducing the species in lofty and inaccessible timbers, which alike provide food and homestead, cradle and grave.

It is a useless creature, performing no office but that of voracious though elusive destruction—'Your Worm is your only Emperor for Diet!'—yet it is associated with a number of picturesque legends. Two centuries ago the earliest naturalist to observe its lethal habits wrote, 'The name of Death-Watches is common enough, and their noise terrible to many who look upon it as the sound of the dreadful messenger of Death, little imagining it to be only a sportive exercise of a very common insect.'<sup>1</sup> In fact the ticking noise which used to suggest an ominous death-knell is really a testimony of affection as the beetle strikes his head upon the friable and perishing timber—soni-cephalus,

<sup>1</sup> Rev. William Derham, Rector of Upminster, in *Phil. Trans.* (Royal Society), xxii (1701), 832, and xxiv (1704), 1,586.

as the creature was once designated. But, if the prophetic nature of the dim tapping sound need no longer cause us such concern, it is none the less a warning, and presages the gradual death of some noble beam or rafter, ultimately threatening the whole structure with collapse.

Coleopterists of to-day call the beetle *Xestobium tessellatum* or *X. rufovillosum*. The pest is abroad in our midst, or rather lurks in the recesses of architectural forests above our heads, and far more commonly than is generally known. The object of the Society of Antiquaries is to draw attention to the prevalent danger, and we have been fortunate in securing the help of Professor Maxwell Lefroy, who has made a close study of this enemy of Church and State. The Society is anxious to offer advice to those who may desire fuller information than that conveyed in this brief circular.

CRAWFORD & BALCARRES,  
*President.*

## II

### THE DEATH-WATCH BEETLE.

THE discovery that the Death-Watch Beetle had attacked the roof timbers of St. Paul's Cathedral and Westminster Hall led to further investigation, and it has been found that nearly all buildings in which oak has been used for roof timbers, flooring, screens, and similar internal structures, are now, or have been, infested with the beetle known as the Death-Watch, whose grub eats tunnels in the solid wood, gradually destroying it. Deal is also attacked when in contact with oak, the grubs working through from the oak to the deal. But the attack on deal never becomes

serious, since the grubs, as they become mature, tunnel to the outside of the deal, where they become beetles and these beetles do not again attack the deal. Therefore in treating the oak it is as a rule possible to treat the deal in contact with it.

Unfortunately there is good reason to fear that the grub is at work in the great majority of buildings in which oak has been used : in one case an oak floor put down in 1882 has already so perished as to be useless : there are a few definite cases in which attack has occurred probably a century or more ago and has ceased because the grubs have devoured all the suitable wood and, as they became beetles, have migrated elsewhere. In such cases, if no serious structural damage has occurred, nothing need be done, and the main object of this leaflet is to point out how the present condition of any oak roof or structure can be ascertained, so that either it can with confidence be left untouched, or, if the attack be in an early stage, be treated at small cost.

The attack of the beetle will be found specially in places which are ill ventilated : wall-plates, purlins, the ends of principal or common rafters in walls are likely places, as also are spots where a number of timbers come together ; the open well ventilated tie-beams or hammer-beams are not so likely to be attacked unless they are very large.

It is important to look for any wood added during restoration or repair, as so many buildings have been attacked in this way, and if there is a definite record of restoration or repair in oak during the last century it is almost certain that attack will now be in progress.

Two beetles commonly attack wood in buildings ; both emerge from the wood when they become beetles, and the nature of the beetle may be recognized by the size of the hole through which it emerges. The larger hole, shown

exactly here (fig. 1), is that of the Death-Watch ; the smaller (fig. 3) is that of the Furniture Beetle. The latter is of no importance in oak, though it may be found in sapwood at the edge of timber. It is common in deal

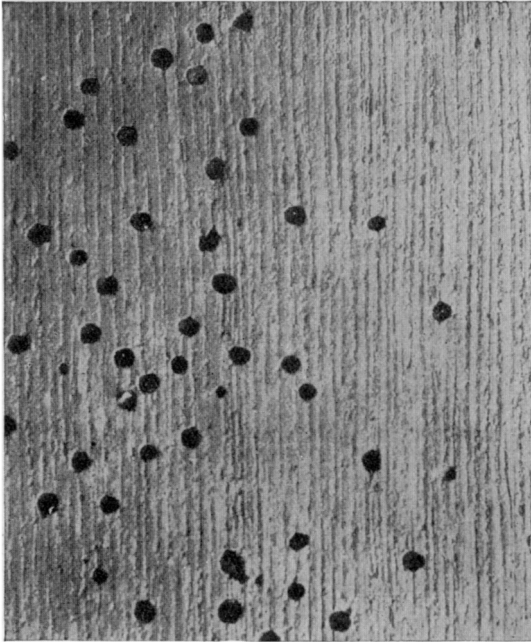


FIG. 1. Holes of the Death-Watch Beetle  
(natural size)

and similar soft woods, but rarely goes so far as to render a timber unsafe.

If the larger holes are found they should be examined carefully to see if they are fresh and clean-cut ; if so they may be recent and active attack may be expected to be in progress ; but if they are of the same colour as the surface, with dirty edges, they are probably old and not significant of present attack. Of course, in long-standing attack both will be found.

A second point to look for is the characteristic oval buff-coloured pellets which are the excreta of the grubs. If these are continually falling, or if fresh heaps of them are found below fresh holes, it may be anticipated that attack is in progress. Several cases of inaccessible roofs have become suspect on account of the constant dropping of these pellets, and examination has shown them to be

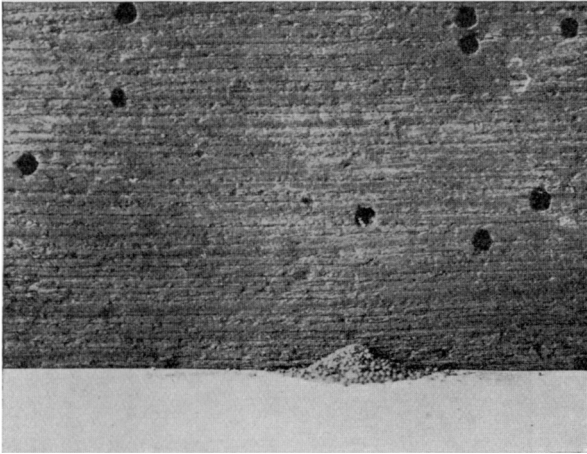


FIG. 2. Pellets outside hole of the Death-Watch Beetle (natural size)

attacked now. These pellets are figured here (fig. 2) and are absolutely diagnostic of this grub.

The facts of the beetle's life may be very shortly told : As beetles, they emerge in May or June, whether from dying oak trees in the open or from building timbers. Before mating, they make the characteristic tapping sound that gave them their name. The female lays eggs, up to about eighty, in cracks, crevices, or open surfaces ; from these come grubs that seek a tiny crack whereby they may burrow in ; for at least that summer and two more they feed on the wood, making extensive honeycomb tunnels.



Then, late in the third summer, they tunnel out to very near the surface and become the chrysalis. From this, in the same autumn, develops the beetle which normally only



FIG. 3. Holes of the Furniture Beetle  
(natural size)

leaves the wood next spring, though if the building is warmed it may emerge earlier.

There is, therefore, a three-year cycle, and active beetles are found outside the timber usually in May and June.

The beetle can fly. In one church, where it was very abundant, it became a nuisance to worshippers. As a rule it does not come down from roof timbers.

Those in charge of buildings liable to attack may

be alarmed by the vast sum spent on Westminster Hall, but this was due to the necessity of reconstruction in steel as a basis for the replacement of the old oak, a method not ordinarily necessary. Unless actual structural repair is required, a building can be treated chemically and at moderate cost, with little disturbance except the uncovering of wall plates and the ends of principals. The basis of the treatment is the application, by means of a spraying-machine, of a liquid that thoroughly wets the timbers, penetrates any decayed parts, enters any beetle holes, gives off a vapour that destroys the grubs inside and leaves behind an invisible, unalterable film of poison which kills emerging beetles or kills grubs seeking to enter. Such a fluid, applied with a proper sprayer, will cover 20 to 30 square yards per gallon. An ordinary church roof may be treated in a day unless structural alteration is required, and the total cost may not exceed fifty pounds. A serious item, of course, is the scaffolding to reach the timbers.

This method has now been in use for over ten years, and a fluid has to be selected according to the conditions of the wood itself, whether it be varnished or painted or has the natural surface. Such liquids must, of course, be non-poisonous, non-inflammable and not irritant. There are at least five such liquids obtainable from reputable firms, at a cost varying from ten shillings per gallon upward.

These details are given to show that the cost of treating an ordinary parish church or ancient building is reasonable and not excessive. Those who have not seen a roof sprayed cannot realize how quickly and completely a wood roof can be treated provided access to it is possible, and in most cases the removal of the outer covering is not necessary.

It is important to emphasize the care that must be taken in any repairs or restoration in which oak is used, whether

it be sound seasoned new oak or old oak from another building. All such should be chemically treated when it has been finally shaped ready to be put in position and after it has been put in.

Had the facts of the beetles' activities been known and the chemical treatment been available when so many buildings were repaired or restored during the last century there would not now be the many cases of attacked roofs.

H. M. LEFROY.

The following works may be consulted :

Derham, *Phil. Trans.* (Royal Society), xxii (1701), 832 ; xxiv (1704), 1,586.

C. J. Gahan, *Furniture Beetles*, British Museum (Natural History), 2nd edn. 1925. 6d.

Sir F. Baines, *Report on the Roof of Westminster Hall*. Cd. paper no. 7436, 1914.

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The Society desires in this leaflet to emphasize two points : first that it is possible to ascertain if a building is attacked ; fresh emergence holes, fresh pellets are danger signals ; secondly, that treatment is not usually expensive or difficult, unless matters have gone so far as to necessitate structural repairs.

In doubtful cases the Society is able to offer advice if specimens are sent by post and, within certain limits, would advise on special cases if full particulars are available as to the structure.

All communications should be addressed to

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