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DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH AND FIRE OFFICES' COMMITTEE
JOINT FIRE RESEARCH ORGANIZATION

REPORT OF A VISIT TO A FIRE-DAMAGED ORLIT HOUSE AT RICKMANSWORTH

by

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Summary

The following report describes a fire which occurred in the roof of an Orlit post-war non-traditional house, due apparently to radiated heat from the boiler flue. The material of the flue was asbestos cement.

Introduction

At the invitation of D. O. Chambers, Hertfordshire Fire Brigade, a visit was paid on the 10th April, 1952 to an estate of Orlit houses at Rickmansworth, to examine a fire-damaged Orlit house. Station Officer Smith, Bushey Station, Herts Fire Brigade, and Mr. Barnes of the Engineer's and Surveyor's Department, Rickmansworth Urban District Council, were also present.

Description of occurrence

The fire had occurred during the afternoon of 9th April, when the Ideal Type O.D.A. boiler was damped down. The fuel in use was coke, possibly with some kitchen refuse. The householder had become aware of a crackling sound above and had found the roof alight. He had no reason to believe that a fire had occurred in the flue itself.

Description of damage

Inspection of the roof-space showed extensive charring of the roof members and tiling battens, and the complete burn-out of the bituminous felt inner lining. Adjacent to the boiler flue, the tiling battens had been burnt through and the tiles released. The roof members at this point were slightly more deeply charred than elsewhere. The top section of the flue was missing and was stated to have been removed after the extinction of the fire. The lead flashing round the flue had been melted away and the wooden struts between adjacent roof members had also been removed. Inspection of the flue showed that the sockets had been mounted facing upwards. The section immediately below that which projected through the roof appeared to be undamaged, and the outside surface was comparatively clean. Inspection of the section which had projected through the roof (3 feet long) showed that this was of 6 in. internal diameter, with a wall-thickness of $\frac{5}{16}$ in. It conformed with the lower permissible limit specified by B.S. 835 "Asbestos-Cement Flue Pipes and Fittings - Heavy Quality", which requires that a pipe of this diameter shall have a thickness of $\frac{3}{8}$ in. \pm $\frac{1}{16}$ in. It was marked "Antracite". The pipe showed a heat crack extending from the lower edge longitudinally for

a distance of 8 inches. By breaking the pipe it was shown that this crack extended the whole length of the pipe through the inner layers of material, only the outer layer of cement (approximately 1/16 in.) forming a seal. The section of the crack was not radial, but curved over circumferentially, and it was soot-marked throughout. Mr. Barnes stated that the houses had been erected 3½ years, and no flues had been replaced. No previous fires had occurred. An inspection of the soot in the top section of the flue showed that it had probably been subjected to flame as the soot in certain places had been burnt away, leaving a light brown deposit.

Description of adjacent house

The adjacent house was stated to be exactly similar to that involved in the fire. Both had been inspected 3 months previously by Ministry of Housing Inspectors, and the flue installations had been passed as satisfactory. In this house, the flue was spaced 1½ in. from the nearest timber roof member, but the lead flashing which bridged adjacent roof members was supported by a panel of wood (½ in. thick) which was shaped to surround the flue at ½ in. distance. No scorching of this wood was apparent. The bituminous felt was cut back to the far side of the main wooden members.

Conclusions

It seems most likely that the fire in this house was caused by radiated heat from the flue-pipe. By comparison with the adjacent house, it is probable that a flue-fire would be necessary to raise the temperature of the outside of the pipe sufficiently to cause ignition of timber even as close as ½ in.