

THE ACTION OF LIGHTNING ON BUILDINGS.

Mr. Killingsworth Hedges, the Hon. Sectreary of the Lightning Research Committee of the Royal Institute of British Architects, in a paper written for the British Association Meeting at Cambridge, gave some results of the investigations as to the principal causes of the failure of the usual style of lightning rod as fitted on the buildings investigated. They are stated thus :—(1) Insufficient number of conductor and earth connections ; (2) the absence of any system of connecting the metallic portions of the buildings to the lightning conductor, especially the interconnection of the finials, rain-water pipes, and gutters. In the author's opinion the frequent damage by side-flash from the conductors might be lessened by running a horizontal conductor along the ridge, or along the parapets of all the roofs, somewhat after the method which is almost universally adopted in Central Europe. The lightning strokes may be divided into three classes : (1) Those where the conductor conveyed a portion of the flash to earth, but the side-flash to other unearthened metallic conductors damaged the building ; the practice of running the conductor round the projecting masonry, often taking sharp bends, doubtless facilitated the deviation of the current from its direct path to the earth. (2) In several observations a metallic roof of large area received the flash, consequently became highly charged, and the single conductor failed to convey the whole of the stroke, a portion of which took a circuitous path—for instance, through a speaking tube and an electric bell wire. (3) A flash struck the building at two points simultaneously, a lightning conductor taking one part of the stroke, but damage was

caused by the other portion selecting an unprotected part of the roof.

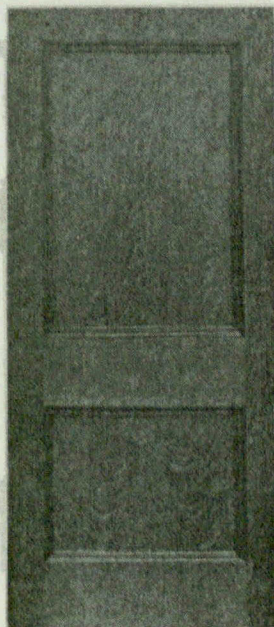
With a few exceptions earth connections had the defect common to nearly all earth-plates which are simply buried in the ground close to the foundations of a building, and owing to drainage soon became dry, consequently are of very high resistance. Architects as a rule object to sufficiently deep holes being made near a structure ; consequently the permanently moist ground is not reached. The tubular earth designed by the author does away with this objection, and can be kept moist by leading a small tube to the nearest rain-water pipe. Although the utility of the external metal was specially put forward in the report of the Lightning Rod Conference in 1882, their recommendation has been apparently disregarded in all the cases under review. The Cavendish Laboratory stroke, which was fortunately unattended with danger owing to the gas in the gas-pipe which formed the path of the current being turned off, would not have taken this circuitous path had the leaden roof been connected to the conductors which ran down the tower only, also to the rain-water gutters and pipes, which should have been interconnected at the bottom and properly earthed. Again, at Bedford last year, St. Paul's Church was seriously damaged by the flash leaving the single conductor on the tower by the water on the roof and passing thence to earth by means of the rain-water pipes. In this case it is interesting to note that the lead pipes were not fused, but their round section was changed into an oval one ; the iron water-pipes were broken. This incident and that at St. Pancras Church, Euston, show clearly that the damage was due not to

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