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NEW METHOD OF PROTECTING BUILDINGS FROM LIGHTNING.
SPARE THE ROD AND SPOIL THE HOUSE!
Lightning Destroys. Shall it be Your House or a Pound of Copper?

PROTECTION FROM LIGHTNING.
What is the Problem?

In seeking a means of protection from lightning-discharges, we have in view two points, the prevention of damage to buildings and the other, the prevention of injury to life. In order to destroy a building in whole or in part, we have to do with that, if we do not consider it as a possibility to express it, energy is required. Just before the lightning-discharge takes place, the energy is stored in the discharge which we seek to prevent exists in the column of fire and in the surrounding air. How is it to be dissipated? What is the best way to dissipate it? It is the best way to dissipate it, as we shall see, to dissipate it as the problem is stated. All we have to do is to find a conductor which will allow the energy or moisture to pass through it. The conductor which will allow the energy or moisture to pass through it is called a lightning-rod. When lightning-rod was first proposed, the science of energetics was entirely undeveloped; that is to say, in the middle of the last century, scientists had not come to recognize the fact that the different forms of energy, heat, electricity, light, sound, etc., are all connected, and that such could produce just as much as any of the other forms, and so forth. At the time of the expansion and contraction of energy was first clearly worked out in the early part of this century. There were, however, some facts known in regard to electricity, a hundred and forty years ago, and among these were the specific resistances of points for an electric spark, and the conducting power of metals. Lightning-rod were therefore introduced with the idea that the electricity existing in the lightning-discharge could be conveyed around the building which it was proposed to protect, and that the building would thus be saved.

The question as to dissipation of the energy involved was entirely ignored, naturally: and from that time to this, in spite of the best endeavors of the interested, lightning-rods constructed in accordance with Franklin’s principle have not furnished satisfactory protection. The reason for this is apparent when it is considered that the electric energy existing in the atmosphere before the discharge, or, more exactly, in the column of dielectric from the cloud to the earth, when it arrives, reaches its maximum value on the surface of the conductors that chance to be within the column of dielectric; so that the greatest display of energy will be shown on the surface of the very lightning-rods that were meant to protect, and damage results, as so often proves to be the case.

It will be understood, of course, that this display of energy on the surface of the old lightning-rods is aided by their being more or less insulated from the earth, but an old lightning-rod can only tend to produce a disastrous dissipation of electrical energy upon its surface,—"drawing the lightning," as it is so commonly put.

Is there a Better Means of Protection?

Having cleared our minds, therefore, as to the idea of conducting electricity, and keeping clearly in view the fact that in providing protection against lightning we must furnish some means whereby the electrical energy may be harmlessly dissipated, the question arises, "Can an improved form be given to the rod that it shall add to this dissipation?"

As the electrical energy involved manifests itself on the surface of conductors, the improved rod should be metallic; but instead of making a large rod, suppose that we make it comparatively small in size, so that it can be used as an additional rod; then we find that it is not fitted to prevent the discharge from reaching the earth, and that the very points which we have just seen to be the most energetic, are the points which we must not allow to exist. This is the very reason why the old lightning-rods did not dissipate the energy, and why the new lightning-rods are better, as they are not so strong. The old lightning-rods were not strong enough to dissipate the energy, and the new lightning-rods are better, as they are not so strong. The new lightning-rods are better, as they are not so strong. And, if we have any doubts as to what is the best form of lightning-rod, we may depend upon it that the old lightning-rods were not strong enough to dissipate the energy, and the new lightning-rods are better, as they are not so strong.

A Typical Case of the Action of a Small Conductor. Frankfort, in a letter to Collins, read before the London Royal Society, Dec. 28, 1850, describing the partial destruction by lightning of a church-tower at Newbury, Mass., wrote, "Near the bell was fixed an iron hammer to strike the hammer, a wire went down through a small gliding in the bell to the wall, and a third through a square in another floor, all like manner, the bell hinging from the lead, the conductors passing to the second floor, till it came near a plastered wall, where the wall to the clock, which stood about seventy feet from another part of the church, so that nothing remained above the bell. The lightning passed between the hammer and the clock, in the above-mentioned wire, without hurting either of the floors, or having any effect upon them, except making the glass-plates, through which the wire passed, a little bigger, and without turning the plastered wall, or any part of the building, so far as the area occupied and the surrounding area of the clock, which latter wire was about the thickness of a goose-quill. From the end of the pediment, down quite to the ground, the halling was exceedingly strong and dangerous, and so was the effect of the lightning from the hammer, and the hammer could be found, except about two inches, that hung to the half of the hammer, and about as much that was fastened to the other, the rest being exploded, and its particles dissipated in smoke and air."

One hundred feet from the church-tower, there stood a large church, which was struck by lightning, under which it passed, and down the wall. The church was a large one, and the church-tower was, therefore, the only point that was struck by lightning, and the church-tower was not struck by lightning, as it was never struck by lightning, and the church-tower was not struck by lightning, as it was never struck by lightning.

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