

XIV. *A Letter from Mr. Edward Nairne, F. R. S. to Sir Joseph Banks, Bart. P. R. S. containing an Account of Wire being shortened by Lightning.*

Read February 3, 1783.

S I R,

IN the Philosophical Transactions for the year 1780, vol. LXX. are printed some experiments of mine, shewing the method of shortening of wire by the effect of electricity. I have since met with a similar circumstance produced by lightning; and, if the following account should meet with your approbation, should be happy to have it communicated to the Society.

On the 18th of June, 1782, Mr. PARKER's house at Stoke Newington was struck by lightning, between two and three o'clock in the afternoon. The lightning passed down the leaden pipe without side the house, which pipe did not reach to the ground by about ten feet. Here the lightning struck from one of the nails which fastened this leaden pipe to the wall to the end of a crank iron that was drove in the wall opposite it, withinside the room, and to which was fastened the wire of a night-bolt, rather thicker than usual. This wire was so very loose before the accident happened, that the bolt could not be raised by the handle at the bed-side, so that they were obliged every night to take hold of the bolt itself to lift it up to fasten the door; but on the night after the accident had happened, they, on going to bed, went to raise the bolt up as usual, to secure their chamber-door, when, to their
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great surprize, they found the bolt drawn up; and on trying to pull it down, they could not with all their strength. It being a particular acquaintance of mine, they sent for me. I went the next day, and not only found the bolt drawn up, but the wire, which they told me before was very loose, and much bent, was drawn very straight, and so tight, that when struck it produced a musical tone. The wire was judged to be shortened several inches; for, had the wire before the accident been straight, it must have shortened it above two inches to have drawn the bolt up.

The whole length of the wire from the bed-side to the bolt was about thirty feet; but the part of the wire on which the lightning passed was about fifteen feet.

Near the crank iron that was directly over the bolt were two wires, which passed through the wainscot to a single one belonging to an alarm. The lightning passed these two wires, without damaging them; but the single one was partly dispersed into smoke, blackening all the wainscot near it; also a great deal was melted into globules, which globules we found by a magnet.

This was the first instance (and, I must own, it agreeably surprized me) that I had ever met with of wire being contracted or shortened by the effect of lightning, though I have now not the least doubt, but that it is always the case; and that is the reason that we find them mostly broke where the lightning has passed, if it does not melt them. I have often shortened wire by electricity, an account of which I gave to the Royal Society as before mentioned.

I have brought a piece of wire belonging to the night-bolt, and also some of the globules, for the inspection of the Society.

I have the honour to be, &c.

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Being desirous of knowing whether the lightning had any ways altered the property of the iron by melting it into globules, I applied to the hon. Mr. CAVENDISH, who very obligingly tried them with different acids, and found that they scarcely shewed any signs of effervescence even when heated over the fire. He next tried some iron filings, which he put to some of the same acid; these not only caused an effervescence, but were intirely dissolved.

He also tried the pieces of steel struck off by striking a light, which being separated by a magnet from the pieces of flint effervesced with the same acids, and dissolved almost intirely, only half a grain being left out of eighteen, and these consisted principally of those parts that were melted in globules.

