Scientific.

DAMAGES BY LIGHTNING.

There is much more destruction of life and property by lightning than one who has not been in the practice of noticing the facts, would at first imagine. A few years since, the question was raised by one of the Professors at Yale College:—"Which of the two had been most destructive of life and property, lightning or steam?" It was stated that for some thirty years past, a faithful record of the disasters by lightning and steam had been kept, and during that time there were more lives lost in the United States by lightning than by steam. The fact surprised me, and since then I have noticed the subject. In one shower which passed over New England soon after I saw the above statement, there were, in different places, eight persons killed by lightning, besides a vast amount of property destroyed. A gentleman in New York, who has kept a record of those events a sufficient time to make the comparison, says that there are more lives lost in the United States by lightning than by steam. Consult his record. Take, for instance, the year 1842, and there you find recorded one hundred and eighty-three persons struck by lightning; of whom seventy-one were killed. One hundred and nine buildings were struck, and many of them were burnt. A school-house was struck, and two of its inmates were instantly killed. It rushed upon a family while kneeling around the altar of devotion, and in a moment deprived the children of both father and mother. A single flash on one house, hurried four out of eleven of its inmates into eternity. The records of each year present a similar catalogue of death and destruction. The results of those who have kept a record of these events, are similar. It is estimated that the damage sustained in this way in the United States in six years, if divided among those who claim to be farmers, would amount to enough to defray the expense of protecting all their buildings. The expense of my mode of protection varies from $5 to $7 to a common country building. I have protected many hundred buildings, and none have failed. Is it unreasonable that thinking men, and especially those who are naturally timid, should be agitated and alarmed during a severe thunder storm, while they are unprotected and liable every moment to its most terrible visitations?

LIGHTNING RODS.

Iron has generally been used for lightning rods, and its efficacy has been established by long experience. Copper has two advantages over iron. It is a better conductor of electricity, and is not liable to rust. But the expense of copper is so much greater than iron, that copper rods will not come into general use. The rust of the rod not only effects its conducting power, but soils the building and hastens its decay. All this may be prevented by keeping the rod well painted with black paint; for lamp-black, which is the foundation of black paint, is a good conductor of electricity. In this way the beauty of the rod is improved, the rust is prevented, while its conducting power is not diminished, but rather improved. Within a few years, efforts have been made by some to set aside the Franklin mode of protection, under the pretence that one rod would not protect a common ordinary building, or that a smooth round rod would not conduct lightning. It is said by some that a rough square rod is a better conductor than a smooth round or square one. How can this be, if friction is an obstacle to speed? The lightning, travelling at the rate of two hundred and eighty thousand miles in a second, requires a very smooth surface. I have experimented on the subject. As an illustration, take four iron rods about eight feet long, one rough square rod, one smooth round, one smooth square, all three unpainted, and one smooth round or square rod painted black. Connect each end of these four rods, with the positive and negative poles of the battery by small chains. Charge the battery and make the room dark, and the fluid can be seen as it passes over these chains on to the rods, from one pole of the battery to the other. The smooth painted rod will take the most fluid, the rough, unpainted one will take the least. What has been said in favor of rough lightning rods being better conductors than smooth ones, is a humbug. Franklin said, the smoother, the higher polished the rod was, the better. Was Franklin right? What is Prof. Olmstead's testimony? He says, "The simple Franklin rod is almost the only one that has ever been used in New Haven, where a large portion of the houses are furnished with it. Under some directions from men of science, these rods have usually been erected, and not one has failed. One blacksmith alone, (Mr. Greswold,) has, during thirty years, put up two hundred, and no building armed with one of these rods, has ever been damaged by lightning, or any of its inmates harmed.

"Our oldest men of science most conversant with these matters, are equally unacquainted with a single case of damage by lightning to premises armed with such rods. Some of them have been peculiarly situated for hearing of such cases, had any occurred within the last fifty years." The Franklin mode has the strong testimony of the most scientific men in the world. What supplanter of Franklin can array in his favor such a multitude of witnesses? It is important that proper attention should be paid to the size and connection of the rod, and to its terminations, especially at the bottom. For here most of the failures happen. On these points there may be some slight difference of opinion among distinguished electricians. Facts show that a good conductor, however large or small, extending in the direction in which the lightning wishes to go, will conduct the fluid without any damage to the building or any thing else, during the length of its conductor, though the conductor, owing to its smallness, is sometimes consumed. The small wire from the clock to the bell, in the steeple of a meeting house, to which an allusion has been made, was reduced to scinders, and yet it carried all the fluid its whole length without any injury to the steeple. There are many instances where bell wires of doors or of other parts of the building, have, during the length, conveyed the whole shock, without any damage to the wire or to the building. It is of much importance that the rod should not only be well imbedded in the earth, but that it should enter it in the best place. Some have recommended to put the foot of the rod into the wall, when convenient. Dr. Hare of Philadelphia, suggests the propriety of connecting the lightning rods in cities with the public aqueducts. Dr. Franklin directed to put the foot of the rod into the ground near the sink spout, or dig deep enough to have the earth around the rod permanently moist. Where Franklin's directions have been strictly followed, I have not found an instance of failure. I have examined some fifty cases where the lightning has left the rod.

Of these, there have been more instances of the new mode of protection than of Franklin's. In almost every case which I have examined, the defect has been at the foot of the rod. It has not entered the earth in the best place, or has not been imbedded deep enough. The lightning does not fly about at random. No element in nature is governed by more simple and perfect laws. When it comes from the cloud to the earth, it has a particular spot which it seeks in preference to any other; and that spot is where its opposite fluid is. Though every particle of matter has its natural quantity of electricity in a latent state, yet there are things in the earth which are good conductors of electricity, and also those which are not so good. The ores and water are good conductors. Water being in a pure and active state, is doubtless the best conductor of electricity in the earth. There are veins of water passing in the earth, in various directions, similar to the veins which convey the blood through the animal system. These veins in the earth being good conductors, excite and attract to themselves the latent fluid, which is in the poorer conductors in the vicinity through which they pass. So where these conductors are, there will be the most fluid. And at the point where two or more of these veins of water cross or intersect each other, there will be the greatest amount of fluid. When a cloud becomes positively charged, the conductors in the earth, under the cloud, will become equally negatively charged. The greatest amount of negative fluid in the earth, will be at the point where these veins of water cross or intersect each other. This being the fact, the most natural inference is, that the positive fluid from the cloud will come down at this point; because here is the greatest amount of negative fluid. I have examined within the last thirty years, many hundred instances where the lightning has struck, and have invariably found this to be the fact. It has long been observed, that where there are beds of iron ore, there the lightning most frequently descends. It will always follow a good conductor, so long as it will conduct it toward its negative fluid or pole, which is the place the lightning is seeking. If the foot of the lightning rod does not reach permanent moistness, or does not enter the earth near the natural fountains of electricity which the lightning is seeking then to reach this place, it must of necessity break away from the lightning rod.

In erecting lightning rods, I first ascertain where the good conductors about the building are; then put the top of the rod in the best place, which is usually the highest, or the chimney which is used the most, then bring the rod down the most direct way to the best conductor in the earth about the building, and well imbed the foot of the rod in the ground. The top of the rod is gilded with gold; the body of it is painted black, and the part which enters the ground is copper. The rod is fastened to the building by wooden cleats, so that the rod does not touch the building, nor a nail touch the rod. The expense of a lightning rod for a common country building, varies from five to seven dollars. Warranted thus:—"If it fails to protect the building while it remains in the position in which it was placed, the expense of erecting it will be refunded." Suffice it to say, that there has been no application for refunding.

Yours,

Mendon, April, 1851. A. H. REED.

Japanning Black.

It is the case in this as in other arts and trades, that different workmen have different modes of operating, in some particulars; though on the same principle. In the process of japanning coarse and indifferent articles, as practiscd in some hardware manufactories, boiled linseed oil is the only blacking material used. The oil for this purpose is first boiled for several hours, and until, on cooling, it will assume the consistence of varnish. This oil is brushed in a cold state, over the work, which is then placed in the open air till the oil has begun to become adhesive. It is then placed in an oven prepared for the purpose, (a common cooking-stove oven will answer) and a gentle heat applied, but not raised above 300° until the oil has become nearly dry; after which the heat may be increased gradually until the oil becomes a full black. It is then withdrawn and allowed to cool gradually. For more delicate work, instead of oil, a solution of gum shellac in alcohol is used, and managed in nearly the same manner, the process being varied according to the nature of the articles, the construction of the oven, &c., as dictated by the experience of the operator. A japan varnish for this purpose may be made by boiling shellac in oil; or for an extra dense black, a solution of asphaltum in spirits of turpentine may be used, or a compound of all these ingredients together.—But when asphaltum and spirits are used, the heat of the oven must be more cautiously applied. With judicious management, a dense black may be produced in 15 or 20 minutes, though, some times the articles to be japanned are allowed to remain in the oven several hours. When plates are to be japanned, they should be carefully placed in a horizontal position. If the heat is applied too strong at first, it will occasion wrinkles in the surface; and if the work is over heated in finishing, the black will be charred and will not adhere. A little experience will satisfy a practitioner on these points.—*Scientific American.*

Etymology of the Names of Countries.

Phœnicia is considered the birth-place of commerce, and its inhabitants became the greatest commercial people in the ancient world. To them is also attributed the invention of letters. From a very ancient history we learn that they gave names to the countries which they visited; and these names, in the Phœnician language, always signify something characteristic of the place which they designate. This will be seen from an examination of the etymology of the names of the following countries:—

Europe, signifies a country of white complexion; so named because the inhabitants there were of a lighter complexion than those of either Asia or Africa.

Asia, signifies between, or in the middle, from the fact that geographers then placed it between Europe and Africa.

Africa, signifies the land of corn, or ears. It was celebrated for its abundance of corn and all sorts of grain.

Spain, a country of rabbits, or conies This country was once so infested with these animals, that the inhabitants petitioned Augustus for an army to destroy them.

Italy, a country of pitch; from its yielding great quantities of black pitch.

Gaul, modern France, signifies yellow haired; as yellow hair characterised its first inhabitants.

Hibernia, is utmost, or last habitation; far beyond this, westward, the Phœnicians never extended their voyages.

Britain, the country of tin; as there were great quantities of lead and tin found on the adjacent islands. The Greeks called it Albion, which signifies, in the Phœnician tongue, either white or high mountains, from the whiteness of its shores, or the high rocks on the western coast.

Syracuse, signifies bad savour; called so from the marsh upon which it stood.

Dandelion Coffee.

Dr. Harrison, of Edinburgh, prefers dandelion coffee to that of Mocha, and many persons, all over the continent, prefer a mixture of chicory and coffee to coffee alone. Dig up the roots of dandelion, wash them well, but do not scrape them, dry them, cut them into the size of peas, and then roast them in an earthen pot, or coffee roaster of any kind. The great secret of good coffee is to have it fresh burnt and fresh ground.

The Farm.

Superficial Farming.

A prominent cause of small profits and poor success in many of our farmers, is the parsimonious application of capital, in manures, implements, physical force, and convenient buildings. In their eagerness to save at the tap they waste freely at the bung. They remind us of the cultivator who candidly admitted his unprofitable system of farming; "but," said he, "I am not yet rich enough to be economical." We observe by a late number of the *Mark Lane Express*, that the present medium estimate in England, of the capital required to carry on the business of a farm is £8 (about $40) per acre, and no prudent man ought to rent more than he has that amount, at least, of available capital to go on with; for a smaller possession, with ample means to manage it, will yield better returns than a large quantity of land "inadequately stocked." Now some of our best farms can be *bought* for about the same sum that the English farms are *rented*, and if the above remark is applied to purchasing, instead of renting, it will constitute excellent advice to Americans. This is a subject for a large volume; and we have only space now to say that if the land-owner has not suitable buildings, the value of the grain and fodder wasted in consequence, would soon pay for them; and the food and flesh wasted by exposed and shivering animals would soon pay for them a second time. The want of manure will prevent the value of crops from rising higher than the cost of cultivating them; and the want of heavy crops to feed animals, will preclude keeping enough to make plenty of manure. In other words a poor and badly cultivated farm will react, and only support a poor and badly fed race of animals and men; just in the same way that a fertile and thoroughly tilled piece of land will sustain animals enough to manure it and keep up its fertility, and men enough to give it thorough tillage.—*Albany Cultivator.*

Salt your Hay.

It is a first rate practice to scatter a little salt on every layer of hay or clover when you are stacking it. Those who have never done so can scarcely imagine the avidity with which horses and cattle eat the salted in preference to the unsalted hay. Especially would we recommend the practice in bad seasons, and in stacking damaged, or low, wet, meadow hay. It retards fermentation, and imparts such a relish that cattle sometimes prefer it to good, well cured hay.—We have often used it at the rate of four quarts to the ton, and have derived much benefit from so doing. Try it.—*Genesee Farmer.*

Diligence is the parent of science and the dispenser of excellence.

Pay as you go, and keep from small scores.