



LIGHTNING.

The safest situation during a thunder-storm is in the midst of a wood, particularly if the neighborhood of the tallest trees be avoided. In such a place of shelter the traveler may take refuge in full assurance that he will there be effectually shielded from harm. The greatest risk of injury from lightning is undoubtedly incurred by persons travelling across a wide and very flat plain, because in such a situation they are the only elevated objects. To lessen the risk, which may here be somewhat serious, advantage should be taken of whatever undulations of surface may exist to keep upon the lowest ground. No doubt the prostrate position would in these circumstances afford greater security than the erect.

It happens not unfrequently that animals are killed by lightning under a tree to which they had betaken themselves for shelter. In these cases the tree is struck partly in consequence of its isolation and partly on account of the presence of the animals beneath it. Usually there are several and often many of them assembled together, huddled probably by terror into contact one with another. The air, heated by their bodies, rises above them laden with moisture, derived mainly from their breath. Who has not noticed the cloud of vapor that in the early morning and in certain states of the weather hangs over a flock of sheep or a herd of kine? The column of moist air, ascending through the branches of the tree toward the cloud, offers, in consequence of the comparatively high conductivity of water, a favorable passage for the electricity. A herd of cattle under a tree is thus exposed to a double risk. Also it is evident that in the open country they are less secure from injury than human beings, who cannot affect the atmosphere in a like degree.

The danger from lightning in a dwelling house is exceedingly small. The materials used in buildings are, with the sole exception of the metals, very bad conductors, and the form of a house is not that which is favorable to the reception of an electric charge. Towers and spires, the latter especially, possess that form; but these structures are nearly always protected by conductors affixed to them. It has been suggested that chimneys may, through the conductivity of their soot lining, attract lightning. But, as communication with moist earth is interrupted below the fireplace, the influence of the soot in diminishing the total resistance is compensated. A house around the roof of which there is a system of water-pipes reaching to the ground is very effectually protected. The timid may put their fears to rest by affixing a conductor to the highest chimney and burying the lower end sufficiently deep in the ground to be always in moist earth.

The risk of personal injury from lightning is necessarily small. The conditions favorable to the occurrence of accidents are few, and of such a nature that the combinations requisite for their fulfillment cannot often taken place. There are but two situations in which danger is to be apprehended—namely, on the portions of a flat district that are destitute of trees, and beneath the branches of an isolated tree standing in a spot that is not dominated at a short distance by higher ground. But even here the danger is not necessarily certain, for thunder clouds do not by any means invariably discharge to the ground.—*Harper's Weekly*.

OPTICAL EFFECTS OF INTENSE HEAT AND LIGHT.

The following facts have lately come under my observation at the rolling mills at this place:

While looking at the eclipse of the sun July 29th, I handed the glass to one of the mill "heaters." He at once told me he could see as well with the naked eye as with the smoked glass. I then tried another "heater," and he at once repeated the same statement. I then went to the rolling mill and tested every "heater" at his furnace. They all told the same story. I hunted up every "heater" in the town except two (who were not found), over twenty in all, and every one declared he could see the phenomenon, and all its phases, as well or better with the eye unshaded. I took the precaution to test each one by himself, told him nothing of what I expected, or of the testimony of others. I made no suggestions to any of them, but let each tell his own story. All told the same tale; one peculiarity all agreed to—the image in the glass was upside down from what they saw with the naked eye. They would describe many peculiarities of color which could not be

seen by others with the aid of the glass. It should be remembered that the "heater" has to see his iron in the furnace while it is enveloped in a flame whose intense glare prevents unskilled eyes from seeing anything, an education of the eye peculiar to this class of workers, as no other class of workmen is exposed to the same degree of heat or light.

I noticed as soon as the eclipse had progressed some time that I became nervous. I observed the same fact in many others about me. My wife at home did not think of the phenomenon at first, but became so nervous that she had to rush out of doors; she then saw the eclipse for the first time. I found this nervousness more in women than among men, chiefly in persons of debilitated frame, such as convalescents. Is this magnetic?

In accordance with your request, I repeated the experiment of Ericsson, and submitted a spherical piece of iron, eight inches in diameter, to a heat of over 3,000° Fah. It was carried to an almost melting point, withdrawn from the flame and placed on a stand. It had the appearance of a disk at all distances tried, up to over 100 feet. As seen by Mr. Hughes, the chief engineer of the mill (one of the most scientific men in his line in the West), myself and others, it was perfectly flat. The convexity did not appear; it was, while in this state, to all appearance no longer a sphere, but a disk. As the iron cooled off, it resumed its original appearance of a sphere. Our mill men were much surprised by this phenomenon which they had been seeing all their lives, but till now had never observed.—*Joshua Thorne, M.D., in the Kansas City Review*.

A NEW ELASTIC GUM.—A rival to India rubber and gutta-percha has been found in a new elastic gum which has been named Balata. This is the milky sap of the bully-tree that flourishes on the banks of the Orinoco and the Amazon in South America. The operation of winning the gum is similar in every respect to that employed with caoutchouc and gutta-percha. It resembles gutta-percha so closely in its general properties that much of it is shipped from Guiana and sold yearly for gutta-percha, although it has many points of superiority. It is tasteless, gives an agreeable odor on being warmed, may be cut like gutta-percha, is tough and leathery, is remarkably flexible and far more elastic than gutta-percha. It becomes soft, and may be joined piece to piece, like gutta-percha, at about 120 degrees Fahrenheit, but requires 270 degrees Fahrenheit before melting (higher than gutta-percha). It is completely soluble in benzole and carbon disulphide in the cold. Turpentine dissolves it with the application of heat, while it is only partly soluble in anhydrous alcohol and ether. It becomes strongly electrified by friction, and is a better insulator of heat and electricity than gutta-percha, on which account it may find considerable application for electric and telegraphic uses. Caustic alkalies and concentrated hydrochloric acid do not attack it; but concentrated sulphuric and nitric acids attack it as they do gutta-percha, which it closely resembles in all other properties.—*Polytechnic Review*.

EFFECT OF GASLIGHT ON THE EYES.—The German Minister of Instruction has recently issued a report on the influence of gaslight on the eye. The conclusion arrived at in this report—the result of frequent conferences with well-known physicians—is that no evil results follow a moderate use of gas, if the direct action of the yellow flame on the eye is prevented. For this purpose screens or shades are employed. Very grave objections, however, exist to the use of zinc or lead shades, most evils affecting the eye being traceable to them. Their use, it is said, inevitably tends to blindness or inflammation, and other harmful effects. The milky-white glass shade is the best, as it distributes the light, and has a grateful effect on the eye. The burner should not be too close to the head, as congestions of the forehead and headaches result from the radiated heat. The glass plate below the gas, employed in some places, is especially useful for the purpose, as it causes an equal distribution of the light, necessary where a number are working at one burner,—prevents the radiation of heat, and tends to a steady illumination by shielding the flames from currents of air. In cases of highly-inflamed eyes, dark blue globes can be very beneficially employed. With precautions of this kind, no evil effects from the burning of gas need be feared.—*Boston Journal of Chemistry*.

THE SEEDS of the *Lycopodium clavatum*, or club moss, are so fine that they appear as a yellow powder, and repel water so powerfully that a person may thrust his hand below the surface of water that has been well sprinkled with it without wetting his hand. This property renders it useful as a preventive of chafing in infants, and as a coating for pills to prevent their sticking to each other. It has another curious property: if a teaspoonful of it be placed in a saucer, the flame of a common match will not light it; it appears to be

as incombustible as table salt; but if a small quantity of it be placed in a short paper tube and blown over the flame of a candle in a cloud, it will burn with a flash like gunpowder, affording a good illustration of the dangerous explosive that is formed when carbonaceous dust is mingled with a certain proportion of air; and shows the necessity of reliable means for the removal of such dust from flour mills, and other manufactories where it is liable to accumulate. There seems to be good ground for supposing the recent terrible explosion and burning of the flour mills at Minneapolis, Minn., were due to the presence of mill dust.—*Scientific American*.

AN UNEXPECTED friend to man has been discovered in a kind of animalculæ engendered by sewage, which prevents the decomposing matter from becoming a dangerous nuisance. Mr. Angell, the public analyst for Hampshire, having examined the sewage-polluted fluid in Southampton water, has discovered that where the suspended matters are thickest there is going on a silent destruction of the foul matters, through the agency of millions of the minute creatures, by some held to be of animal, but by Mr. Angell believed to be of vegetable origin. On examining the muddy fluid through a microscope, it was found to contain myriads of little brown organisms, surrounded with a gelatinous substance. Each specimen was found to be active in its movements and of peculiar shape, being furnished with a belt of cilia round the centre of the body, and with a long transparent and very flexible tail. After death, these tiny atoms give off an odor similar to that of sea-weed, and change to a green color. During life they evolve bubbles of oxygen gas, which serve to purify the water from the effects of the decomposing matter on which they themselves feed. It is a pity, however, that man, by polluting rivers with sewage, should stand so much in need of this self-developed scavenger.

LOCKPORT, N. Y., is trying the experiment of heating buildings by wholesale. According to a local paper, a large school building, the largest hall in the town, with other rooms in the same building, and forty large dwellings, are all heated by steam made in a single boiler five feet by sixteen in size, and beside this two steam engines, one of them more than half a mile from the boiler house, are run by steam from the same boiler. About three miles of street mains have been laid, extending through fifteen streets and supplied with steam at a pressure of thirty pounds to the inch. The total space warmed by this single boiler is more than one million cubic feet. The originator of this system claims to have proved that a district of four square miles can be economically warmed from one central point. Steam thus applied may be used for warming, cooking and laundry purposes, running of steam-engines, and the extinguishment of fires. Great reduction of expense, avoidance of inconveniences and danger from fire, are some of the advantages claimed for the new system.—*Watchman*.

THE STATEMENT has been made by a Sheffield (England) physician that the fork-grinders' employment is probably more fatal to human life than any other pursuit in England. According to this authority there are generally from eight to ten individuals at work in the room in which this industry is carried on; and the dust which is created, composed of fine particles of stone and metal—the grinding being always performed on dry stone—rises in clouds, and pervades the atmosphere to which the operatives are confined. The dust, which is thus every moment inhaled, gradually undermines the vigor of the constitution, and produces permanent disease of the lungs, accompanied by difficulty of breathing, cough, and a wasting of the animal frame, often at the early age of twenty-five; and the average longevity of fork-grinders is found not to exceed thirty years.

OATMEAL, CRACKED WHEAT and similar boiled breakfast dishes often become more or less indigestible from being "bolted" in the usual Yankee style. They are soft and "go down" easily, and are shovelled or spooned into the stomach, with no delay in the mouth en route. They need mastication as really as beefsteak does—not to save one from choking (which many people seem to suppose is the sole reason for chewing), but to mix thoroughly with saliva, which is a digestive agent, and not a mere lubricant to expedite the passage of dry food down the oesophagus.—*Boston Journal of Chemistry*.

DR. LORING, in discussing before the New York County Medical Society the serious question, "Is the human eye gradually changing its form under the influence of modern civilization?" confirms the opinion, so far at least as short-sightedness is concerned. Constant study, now incidental to the lives of so many, has, he says, a tendency to engender this derangement of the eye, and it is often transmitted to descendants. In his opinion, near-sightedness is a disease of childhood.

DR. CASSELLS, a distinguished aural surgeon

of Glasgow, Scotland, lately read a paper describing numerous cases of ear disease, traceable to sewer gas, which had poisoned the air of houses in which the patients resided. He believes this sort of poison to be a very frequent cause of deafness.

THE RUSSIAN BAPTISTS who have been three years in prison at Odessa, for promulgating their faith, have been recently tried and acquitted, to the great joy of the spectators at the trial. The Attorney-General had demanded their exile for three years to the mines of Siberia.

DOMESTIC.

TO CURE MILDEW.—Wet in rainwater: rub the spots with soap and chalk; lay in the sun and dew two or three days and nights. The spot should be thoroughly rubbed with the soap and chalk once or twice each day.

MACARONI SOUP.—Boil a couple ounces of macaroni (broken up in convenient pieces) in a pint of stock free from grease, to which add a good pinch of salt. When cooked (ten or fifteen minutes), drain them and put them in the soup tureen containing one quart of well-flavored clear stock, boiling hot. Grated Parmesan to be handed round at the table.

THE GOOD QUALITIES OF BROWN BREAD.—Good brown bread supplies in itself the nourishing properties of many kinds of food. It contains albumen fibrine, gluten, and phosphate of lime; it makes bone, muscle, blood, and tissue. The wandering Arab lives almost entirely upon such bread, with a few dates as a relish—and this not because meat is scarce in his part of the world, but because he feels no need for it.

LIGHT PASTE FOR TARTS.—Beat the white of an egg to a strong froth; then mix it with as much water as will make three-quarters of a pound of fine flour into a stiff paste; roll it very thin, then lay the third part of half a pound of butter upon it in little bits; dredge it with some flour left out at first, and roll it up tight. Roll it out again, and put the same proportion of butter; and so proceed till all be worked up.

ADULTERATED BREAD.—The well-to-do, who patronize fancy bread at fancy prices, are treated to as much adulteration in their flour as the poor; their breakfast-rolls are whitened with alum, which is an astringent, hindering the digestion. The rich, however, have only themselves to blame if their bread is not pure wheat; for pure wheat yields a grayish loaf, and, if whiteness and sponginess be insisted upon, they can be obtained only at the expense of quality.

SURPRISE PUDDING.—One cup not quite full of sugar; two cups of flour; four eggs; two full teaspoons of baking powder; a little salt and fresh lemon. Break the eggs in an earthen dish without beating; pour over these the sugar; sift in the flour and baking powder; first stir and then heat all well for ten minutes. Bake in well-buttered oval tin, in pretty quick oven (it ought to bake in twenty minutes). Eat with cream or any sauce preferred.

POTATO PUDDING.—Eight potatoes; one fourth of a pound butter; one gill of milk; four eggs (well beaten); flour enough to make a stiff batter; a little salt. Be sure to mash the potatoes through a colander to make smooth; flour the inside of a pudding-bag, allowing three inches for the batter to swell; boil incessantly two hours; plunge the bag for a moment in cold water before turning out the pudding. Serve with maple syrup, or sauce, as preferred.

MAKING COFFEE.—The art of making good coffee consists in observing one or two things. First of all, it should be freshly ground; the next thing is to draw out the full strength and aroma, and at the same time preserve the fluid perfectly clear and free from grounds. On the continent it is boiled for a short time, but in England it is usually soaked in water kept as near boiling-point as possible. The French are generally allowed to be the best coffee-makers in the world, and they allow one ounce of coffee to each coffee cupful of water. Two pots are used in the making. Into one boiling water is poured on the ground coffee, and allowed to remain 4 or 5 minutes, when it is poured off as clear as possible. The grounds are then boiled with the remaining water for two or three minutes and both lots mixed together. A shred of saffron or a little vanilla, is often added, and to make the grounds settle, half a cupful of cold water is sprinkled over the decoction; this descends to the bottom, carrying the grounds with it. Coffee may be clarified also by adding a shred of isinglass or add the white of an egg. The great fault of English coffee-making is the failure to draw out the full strength, and this arises in most households from the use of the water, which has not reached the boiling point, or the too great haste with which the infusion is made.—*Cassell's Dictionary*.