NVENTIONS AND SUGGESTIONS FOR THE PREVENTION OF FIRES.

Next to saying "I told you so" there is no mental effort which conveys more unalloyed pleasure to the human race than to calmly suggest and expatiate upon means by which calamities might have been avoided, after such misfortunes have taken place. The recent fire in Boston gives rise to many instances of this fact, and the daily journals are filled with editorials and communications, some conveying excellent ideas worthy of careful attention, others suggesting plans as ridiculous and impossible as can well be imagined. The Chicago fire, though a severe lesson, served but to interrupt our sleep of fancied security; the Boston conflagration has been the means of a thorough arousing of the whole nation; and, as a result, plans innumerable for the avoidance of similar disasters are being devised.

A number of these suggestions, some found drifting about in the columns of periodicals, others obtained directly from their originators, we have gathered together; and below we briefly give their general details.

A word at the outset as to roofs, and in particular the Mansard, which, like Mrs. O'Leary's cow in Chicago, has been the special object of public malediction. The blame should not be placed on the architectural design—no one will deny that the roof is handsome and that its ornate pavilions are a great improvement over the squat coverings of former times—the fault lies in bad material and worse construction; flat roofs, if made of thin beams, protected by a single sheeting of tin or slate, would be exactly as unsafe. That we can build proper roofs on the French plan is amply evidenced by the one in process of construction on the new *Staats Zeitung* building and on the Masonic Temple in this city. A mere glance at the massive iron beams and stone window casings of these edifices will remove all doubts of the structures being dangerous.

The main objection to the Mansard is its hight from the ground, but if we provide a proper supply of water and suitable means of forcing it where it is needed, this can be overcome.

Like Chicago, Boston has demonstrated the value of brick over every other building material, as a fireproof substance, and consequently many of the plans suggested are based on the construction of brick walls.

A daily contemporary editorially says that parapet walls should be placed between the houses, eight or ten feet high and pierced with a few apertures so arranged as to admit a free play of hose pipe. These partitions are designed not only to check the advance of the flames but also as barricades behind which the firemen can obtain shelter.

A recent invention consists in building two immense walls of solid brick masonry intersecting in the center of every block. At the point of intersection the partitions are highest, their upper edges sloping off to the corners of the building. The idea is to confine the fire to one quarter of the square and so prevent its spread.

Another proposition is to carry the walls of a building three feet up above a flat roof, forming a reservoir which is to be flooded with water from below by a force pump.

One of the best plans is that derived from the French, and consists in making all partitions and floors of solid plaster and iron.

A scientific contemporary advocates the construction of partitions analogous to sectional iron boilers. Iron enclosed water spaces are suggested, not to be over one inch in thickness and subjected to a hydraulic pressure of three or four feet head. The sections are to be flooded in case of fire.

Various plans are published having in view increased water facilities. It is proposed to carry river water through the streets in large mains, from which pipes are to extend through the houses and above the roofs, having suitable hose connections in every story, by which, the water being under pressure, a thorough flooding can in a short time be effected.

Another idea is to erect reservoirs on elevated positions into which salt water is to be pumped and distributed by pipes throughout the city.

A very similar device is to build towers along the ridge that forms the backbone of Manhattan Island, and supply fresh water drawn from the Hudson river some distance from its mouth.

In Chicago wells are suggested, which, communicating with the river, are to be sunk at suitable points and an increased quantity of water thus obtained.

Another design, for utilizing salt water, is to locate a powerful pumping engine in every fire district, which, in connection with a large standing pipe, is to maintain such a constant pressure at every hydrant as to obviate the necessity of fire engines.

One excellent idea is the pressing of the ferry boats into service, placing them under the orders of the Chief Engineer and requiring them to carry donkey engines of uniform power, with hose nozzles regulated to a standard gauge. In case of fire, the vessels are to congregate at some fixed point and act in concert in forcing water into the city.

Additional mains from the Croton reservoir are suggested, by which the supply is to be economized by forbidding tapping except in certain localities.

A well known engineer considers it practicable to force salt water, in time of emergency, through the regular fresh water pipes, which he would have constructed of double their present size.

One of the best devices for the application of water is that published some time since, in this journal, consisting in a large number of perforated pipes extending entirely through the building. By merely turning a cock, thousands of fine streams are thrown in every room.

A recent invention on this principle consists in permanently affixing a perforated pipe at the summit of the roof, allowing the water to run over the latter, and thence down the side of the building.

A further improvement is a portable system of perforated tubes, which can be readily laid along a roof or rested on supports within the building and thence connected with the engines. This plan has the advantage that the firemen can thoroughly drench buildings even at their highest portions, which otherwise they would be unable to approach on account of the heat.

We have encountered two ingeniously ridiculous ideas. The first is the proposition that our fire department be provided with rolls of thick woolen blankets, sufficient to surround a block of houses. With these the fire is to be smothered by hand, while the cloth is kept wet by the engines. The second inventive genius thinks that a woolen veil, saturated with water and placed between a fierce conflagration and threatened buildings, will instantly avert all danger.

From all the plans, ideas and suggestions above enumerated, and from the experience we have so dearly earned, a few general conclusions may be safely drawn. Of these the chief is that a city to be fireproof needs both properly constructed buildings and a thoroughly efficient water supply. No matter how well organized a fire department may be; if the houses are built of inflammable material, disasters greater or less must ensue. And on the other hand, even if edifices be never so well constructed, if the water supply and its mode of application be not as nearly perfect as can be, similar consequences will follow. In the construction of fireproof buildings, brick should be preferred. Walls should be thick and solid. Avoid hollow partitions and floors of wood or lath and plaster. Employ iron beams and either solid plaster or surfaces of plaster packed with nonconducting and noninflammable material within. Provide double iron sliding shutters to all windows. Place iron trap doors on the elevator shaft at every story, and thus be able to cut off the immense draft it produces. Introduce a reliable system of perforated pipes or similar devices for sending water throughout the structure, and provide hand fire extinguishers ready for immediate use.

For the high buildings of large cities, steam fire engines have been proved inefficient. Therefore an additional supply of water must be provided, drawn from the rivers, kept under constant pressure capable of throwing the highest necessary stream. The water supply should be so introduced as to be available as furnishing power for elevators, supplying small manufacturers and others, thus enabling them to dispense with steam apparatus and its attendant dangers.

Blowing up buildings with gunpowder is a last resort and should never be left in such unskillful hands as it was at Boston. Fire must be fought by men practised in the warfare, and never delegated to the inexperienced, however willing.

Lastly, in every city in the country is needed a well considered code of municipal regulations in regard to precautions of every kind against fire, enforced by heavy and severe penalties, and in addition, a rigid and efficient system of inspection to see that such regulations are fully observed.

What is Slate, and how was it Formed?

That slate may have been once mud is made probable by the simple fact that it can be turned into mud again. If you grind up slate, and then analyze it, you will find its mineral constituents to be exactly those of a very fine, rich, and tenacious clay. Wherever the top of the slate beds and the soil upon it is laid bare, the black layers of slate may be seen gradually melting, if I may use the word (says the Rev. Charles Kingsley in "Town Geology"), under the influence of rain and frost, into a rich tenacious clay, which is now not black like its parent slate, but red, from the oxidation of the iron which it contains. But, granting this, how did the first change take place? It must be allowed at starting that time enough has elapsed, and events enough have happened, since our supposed mud began first to become slate, to allow of many and strange transformations. For these slates are found in the oldest beds of rocks, save one series, in the known world; and it is notorious that the older and lower the beds in which the slates are found, the better—that is, the more perfectly elaborate—is the slate. The best slates of Snowdon (I must confine myself to the districts which I know personally) are found in the so-called "Cambrian" beds. Below these beds but one series of beds is as yet known in the world, called the "Laurentian." They, occur, to a thickness of some 80,000 feet, in Labrador, Canada, and the Adirondack mountains of New York; but their representatives in Europe are, as far as known, only to be found in the northwest highlands of Scotland and in the island of Lewis, which consists entirely of them, And it is to be remembered, as a proof of their inconceivable antiquity, that they have been upheaved and shifted long before the Cambrian rocks were laid down "unconformably" on their worn and broken edges.

Mechanism.

How much the people of England owe to the development of mechanistic germs, says Dr. Rigg in a recent lecture, may be inferred from the statement that if the work of machinery on this little island home of ours for one day had to be accomplished by single human power, the population of the whole globe would hardly suffice to do it. Where such stupendous results are evolved, many minds must have contributed to the common stock; and if what those who are competent to form an opinion tell us be true, namely, that man, in this nineteenth century of the Christian era, is in mental and physical power as he was nineteen centuries before that era commenced, then the conclusion is obvious, that he who would contribute new ideas to these contrivances which minister to our comforts and our wants, must investigate the contrivances that have been already made.

Investigation should never be dormant; and yet it does sleep, and soundly too, until a "strike" or a "lock out" reminds society that machines and not men are in all respects best adapted to do much of the work now slowly and slovenly produced by manual labor. They do it, too, with an accuracy, a perfection, and a speed which the direct application of human skill seldom attains. In the bodily frame is mechanism for various purposes; in the machine, for one purpose only. "Strikes" and "lock-outs" often bear unexpected results in the introduction of mechanical contrivances which, in time, extinguish particular classes of manual labor.

An inventive turn of mind is, and always has been, common to a very large portion of mankind. Such minds are prone in this century, as doubtless they were in former ones, to live in isolation from that which is without. Hence, whatever seems to originate in themselves is regarded by them as a novelty, and therefore, as such, is concluded to be of value. Many a day, many a night, and many a fortune have been expended on contrivances and experiments which generations long past had emphatically pronounced to be delusions and snares. A sure remedy for this is in the study of that which has been done. It has often fallen to my lot to try to disabuse an inventor of the idea that a specific suggestion had in it either originality, novelty, or utility. The very kindest attempt to do this is as thankless an office as a man can undertake. In placing, therefore, before you a multiplicity of illustrations, it has been in the hope that they may be suggestive of further inquiry.

[From the Quarterly Review.]

THE CONSCIOUSNESS OF DOGS.

A dog feels anger precisely as we do, and after provocation is sometimes vindictive and sometimes placable, according to his individual character. He is susceptible of hatred of the bitterest kind. He is so excruciatingly jealous, that his life becomes a burden in the presence of a favored rival. His envy continually leads him to eat what he does not want least another animal should take it, and to illustrate the fable of the dog in the manger. Gluttony holds out to him temptations under which even his honesty sometimes succumbs; but, on the other hand, from drunkenness he is nobly emancipated. A dog mentioned by the Rev. Thomas Jackson ("Our Dumb Companions"), having been once made so drunk with malt liquor that he was unable to walk up stairs, ever after declined to taste the pernicious beverage, and growled and snarled at the sight of a pewter pot. Again, as to love, Don Juan was a cold and unenterprising character compared to a dog; and as to maternal affection, the mother dog feels it with heroic passion, starving herself to death rather than forsake her offspring. Gratitude may be almost said to be a dog's leading principle, supplying first the spring of allegiance to his master, and ever after reconciling him, with true magnanimity, to take evil from the hand from which he has accepted good. Regret and grief he feels so deeply that they often break his heart. Fear is a passion which dogs exhibit with singular variation, some breeds and individuals being very timorous, and others perfect models of courage, the latter characteristics and fortitude seeming to be more characteristically canine. A greyhound has been known, after breaking his thigh, to run on till the course was concluded. As to hope, no one can observe the dog watching for his master's step, as in Landseer's picture of "Expectation," without admitting that he knows the sentiment as well as we. Pride in a successful chase may be witnessed in every dog, and even felt in the quickened heartbeats of a greyhound when caressed and praised. That dogs have personal vanity appears from the fact that they are so manifestly dejected and demoralized when dirty and ragged by long exposure, and recover their self-respect immediately on being washed and combed. Chivalry and magnanimity may nearly always be calculated upon in dogs, and wife-beating is an offence to which the four-footed beast never descends. The stories are endless of big dogs generously overlooking the insults of small curs, or taking them into water and giving them a good ducking as a punishment for their impertinence, and then helping them mercifully back to land. Sense of property, bifurcating into both covetousness and avarice, is common to all dogs. The kennel, rug, collar, water basin, or bone once devoted to his use, no dog can see transferred to another without indignation. Frequently he "covets his neighbor's house," and attempts to ensconce himself in it surreptitiously; and almost universally he covets his neighbor's bone, and purloins it, if he dare. Even from avarice he cannot be wholly exonerated, observing his propensity to bury his treasures. Shame, after transgressing any of the arbitrary rules imposed on him, a dog displays with ludicrous simplicity; but of the deeper sense of violated modesty which in human beings accompanies the commission of sin, the dog evidently knows nothing whatever. Humor, so far as it can proceed without language, the dog catches readily from a humorous master, and also the enjoyment of such games as he can understand. As a baby crows with glee at "bo-peep," so a dog barks with delight at "go-fetch." Make-believe runs and false starts, romps and ticklings, throwing a ball for him to catch on the grass, or a stick to fish out of a lake, all supply him with pleasures perfectly analogous in their nature to that which boys and men find in blind-man's-buff and prisoner's base, lordly cricket, and lady-like croquet. Lastly, faith in a beloved superior is perhaps the most beautiful and affecting of all the attributes of a dog.