Correspondence.

Curious Freaks of Lightning.

To the Editor of the SCIENTIFIC AMERICAN:

Near this place, last summer, a negro who was plowing with a double team, perceiving that a storm was rapidly approaching, unhitched his horses from the plow and, mounting one and leading the other, started for his home, near by. He had gone only a short distance when both horses were instantly killed by a bolt of lightning while the negro escaped without injury. He was slightly shocked and complained for a time of pain in his limbs, but was soon entirely restored. The horse the negro rode was slightly in advance of the other, by the length of the bridle rein and the extended arm of the negro, the led horse not keeping abreast of the other, but lagging a little in the rear. The escape of the negro, under the circumstances, seems almost marvelous, and to the unscientific mind is wholly inexplicable. Will you kindly explain upon what theory the negro's escape can be accounted for?

F. E. BUFORD.

Lawrenceville, Va., December 1, 1898.

[There is no theory for such occurrences. They are facts which are met with every summer, during the season of thunder storms. It does not explain the matter to say that the discharge passed around the rider but passed through the horses.—ED.]

Fire and the Modern Skyscraper.

To the Editor of the SCIENTIFIC AMERICAN:

Any communication appearing in such a high class periodical as this carries with it much weight from its publication alone, and is certain to be very widely read. In your number for December 24 is a letter filled with the most sarcastic criticisms of the operations of the New York Fire Department at the fire which damaged the "skyscraper" block on Broadway early in the same month. The powerful engines in use that night are derided as "little squirt guns on wheels," and the apparatus in general is ridiculed most extravagantly. The opinions of the famous chief of that most efficient organization are scornfully condemned, with a side fling at the fire authorities of Philadelphia. In brief, our present system of city fire protection is bitterly denounced as unable to cope with what we are to understand are modern conditions, and our experienced chiefs are assailed because they unite in urging a safe limit to the height of buildings.

Now, while neither chief nor firemen are likely to be distressed by this, and know better than to expect everybody to appreciate their heroic work on that stormy night, there may be some of your readers who would like to know whether to pin their faith in the advocates of these monstrous buildings or in the fire chiefs with their many years of service. They may ask whether the opinions and advice in this letter of December 24 are really valuable, or whether they are to be classed with the excited comments that may be heard from the "curbstone critics" among the spectators at every large fire!

To begin with, it would seem that one reason for such a caustic letter lies in the fact that, so far, the chiefs are having much the best of the discussion, and that thinking people are listening to them more than ever. This particular fire resulted exactly as predicted by such authorities as Chiefs Bonner, Swenie, and Baxter, who have from the first contended that, while fires in these towering structures might be fairly well handled as long as the heat is not too great to allow the firemen to work inside, the tremendous amount of heat thrown against a "skyscraper" by a hot fire alongside would cause immense damage, to say the least. This is precisely what happened. A five-story building burned in a high wind, and from it such a mass of flames arose that the adjoining twenty-story structure became ignited through the windows, and a heavy loss followed. Yet we are told by this writer that "skyscrapers" are preventers of conflagrations, and that a law should be passed requiring the erection of a double row of them, the length of Broadway. "Who ever heard of a serious fire originating in a 'skyscraper'?" asks he

It must be admitted that last month these pretended bulwarks were pretty thoroughly riddled aloft by the heat from their insignificant neighbor. What if this latter had been twice as large and had kept up its heat longer and in greater volume? What if the fire had come rolling up to the twenty-story structures with the blast and heat of two or three squares of real conflagration behind it? If we may judge from the actual work of the flames on December 4, the "skyscrapers" would have been reduced to skeletons, even if they did not buckle and fall in a tangled mass! Yet, if the Rogers & Peet concern, where the fire started on that unlucky occasion, had been surrounded by buildings of somewhere near its own size, the whole loss would have been confined within its walls, for the fire department controls many such fires every year with little or no damage to adjoining property.

There are happily not many of these "modern" structures in any city, and this is one reason why we have not yet heard of a serious fire originating in one of them. Another is, that being few in number, they are as yet used exclusively for office purposes and the contents are not especially combustible. Let them be erected in such numbers as to compel their use for mercantile business, storage, or light manufacturing, and we shall see them cause fires of appalling magnitude, and this in spite of as good "fireproof" construction (so called) as has yet been devised. What would it avail to build a twenty-story building of such material, if every floor were unbroken in area and piled full of the miscellaneous stock of a modern department store?

But your correspondent writes that each "skyscraper" must have a water system of its own for interior and exterior protection, and the supply for these systems must come at a high pressure through pipe lines from fireboats at the rivers. Let us see how this would work, for we are assured the plan would be such a brilliant success that steamers, towers, and other heavy apparatus might be done away with altogether!

In attacking a fire inside any one of these tall buildings, the great problem is to speedily place firemen on the endangered floor. To get the water there is easy, for any one of the despised "squirt guns on wheels" can, by means of a standpipe, operate a heavy fire stream even on the very roof of a structure like the Park Row building, 390 feet from the sidewalk! A fireboat is not to be considered at all for such work when each minute may be worth an hour, as she must pick her way among crowded shipping to the proper landing, and make various attachments to dock and pipe inlets before the pumps can even begin forcing water toward the fire many blocks away. Hence while these boats and their pipe lines are most powerful and valuable auxiliaries to the street forces, they can no more be depended upon for quick work at a remote point inland than can a steam fire engine be expected to get "first water" on a vessel anchored in midstream. Our amateur critic might have been suspected of some knowledge of his subject had he suggested district pumping plants at the rivers, connected with systems of mains kept always filled and under pressure for service at a moment's notice. Surely nothing less would serve the purpose if our "tiny steam fire engines" are to be "washed into the bay," and the interior pipe systems are to extinguish the incipient fires. Still there is nothing in any of these suggestions to provide for getting men to work the streams into the aerial regions where the fire may be playing havoc. It frequently happens that the elevators are not running, and then the delay involved in climbing the stairs is likely to be very disastrous. And if there are either large areas or combustible materials to be encountered when they do get there, the bravest fire fighters may be compelled to retreat, and then what hope is there for the building? We are informed that streams may be thrown in from other "skyscrapers," but there may be none near enough, and outside streams are only partially effective at the best, especially in a high wind. There are automatic appliances that would be of great assistance if the owners of the buildings could be made to see the necessity for installing them, but they could not be depended upon altogether.

We are further informed that adjoining buildings might be thoroughly drenched with water from our "skyscraper" water systems, and it is not to be denied that such a mode of attack would often be useful. A practical fireman would be apt to suggest, however, that water cannot be thrown in that manner into a low building from above until the roof burns off, for the whole affair is designed to shed water; and after the fire gains that much headway, the chances are likely to be at least even between the furiously ascending flames and the largest streams of water that can be controlled from above. After all points are considered, it is likely to be decided that the "skyscraper" people had best devote their entire attention to protecting their own windows, in time of fire, for there is no certainty that they may succeed in doing that!

In at least one other city a hot fire entirely opened a large section of an adjoining steel frame monster, but was fortunately checked when the heart of the structure was exposed. This gives a fair idea of what a conflagration would do, and yet our fire chiefs are called "old fogies" because they will not shut their eyes to the possibilities involved in the general building of "skyscrapers"!

Being something more than mere theorists, it is certain that our chiefs will continue to stand together in demanding a limit to the height of buildings. They are heartily in favor of fireboat pipe lines, auxiliary steam or electric pumping systems or any other aids that may be summoned as reserve forces in case of large fires, but there is nothing in their experience to indicate that the general installation of all these helps would justify the building of more "skyscrapers,"

HARRY W. BRINGHURST,
Secretary Pacific Coast Chiefs.

Seattle, Wash., January 5, 1899.

Sights and Range Finders for Our Coast Defense Guns.

The War Department has placed an order with Warner & Swazey, of Cleveland, for three hundred telescopic sights to be fitted to the coast defense guns of the United States. The addition of these sights will, it is thought, increase the accuracy of the fire of these weapons, and they would be of great value in case of emergency caused by the destruction of a range finder. In appearance they somewhat resemble the Scott sight used in the English coast service. They differ from the English sight in producing an irregular image by means of Brashear prisms. This is accomplished without increasing either the diameter or length of the telescopic tube. The subject of a telescopic sight for great guns has given the ordnance officials no little concern for some time, says the special correspondent of The Evening Post. Owing to the limited demand for the instruments, there were not sufficient inducements for American opticians to work out the problem, but the Spanish war awakened American makers to the fact that there was a real demand for first-class sights, and the present instrument is the result.

The new sight has a field of view of six degrees. The deflection scale is graduated to three minutes of the arc, and the greatest reading is two degrees thirty minutes each side of the zero mark. The deflection can be adjusted by means of an outside scale at any time by the gunner without removing his eye from the eye-piece. The new sight is adapted for either field, siege, or coast defense service. With the present order the War Department will possess nearly four hundred and fifty telescopic sights for great guns. The same correspondent says that the War Department has settled upon the Lewis range finder. A number of ordnance officers has reported that for secondary stations either the Lewis or Rafferty range finder might be used. For primary stations the Lewis range finder was alone recommended. Besides range finders, orders have also been placed for azimuth instruments for use in obtaining ranges in siege batteries. It is proposed to have on hand at all times a sufficient number of these instruments to equip any number of siege batteries that are likely to be assembled.

Horseless Vehicles.

As The New York Herald says, the automobile has captured the fort and is here to stay until superseded by something better. In all its picturesque ugliness, it is a boon and a blessing. It looks like a hackney-coach with the delirium tremens, but it is a sober-minded, straightforward vehicle. We not only give it our respect but our admiration, for, with its big rubber wheels, it gets over the ground in a velvety sort of way and reaches its destination without becoming tired.

It does not take long for a new invention to vindicate its right to exist if only it proves useful. When this queer-looking thing, a kind of caricature, first made its appearance, nobody knew whether to laugh at it as a good joke or to become indignant at the intrusion. By slow degrees it worked its way into our affections, and now we love what we aforetime abhorred.

The principle on which it is built is being so expanded as to include the heaviest sort of drays, and the hour is not so far distant when no horses will be in sight below Central Park. The gentle brute has had his day, but he will soon be a relic of the past except for purposes of pleasure. He has done his duty well, but he roused our sympathies in slippery weather and proved that four feet are not enough to stand on when the streets are icy.

All hail to the automobile, and may some gifted genius soon arrive who will whip it into shape and make it presentable! All things are possible, even a good-looking horseless carriage.

Work on the Botanical Garden.

The work on Horticultural Hall in the new Botanical Garden in Bronx Park, New York, has begun, and the building, which is to be of iron and glass, will be finished and ready for occupancy by October 1 of this year. The hall will be 512 feet long and 60 feet wide, and the central dome is to be 90 feet high and will allow palms 75 feet high to be kept in it. The new building is about 1,200 feet south of the museum building of the Botanical Society. New collections of the flora of Porto Rico, which have been made by funds donated by Mr. Cornelius Vanderbilt, will have a place in the hall.

ONE of the most serious objections to celluloid articles has always been their liability to easy ignition; but we are now informed by a contemporary that celluloid may be made uninflammable by dissolving 25 parts of ordinary celluloidine in 250 parts of acetone, and then adding sufficient of a solution of 5 grammes of magnesium chloride in 15 grammes of alcohol to make a paste: this forms when the proportions of the first named and the latter solution are about as five to one. After careful kneading and drying the resultant material is said to be quite incombustible.