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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

OUR ENORMOUS FIRE LOSSES.

We note that in a recent interview, the president of the New York Board of Fire Underwriters has made an alarming statement, to the effect that it is only a matter of time before the skyscraper district of New York may be destroyed by fire. We presume that in making this statement he had in mind the disastrous conflagrations in Baltimore and San Francisco; but we think that, as matters stand to-day, there is a wide difference between those two cities and the present condition in lower New York. In Baltimore, and even more so in San Francisco, there were a few scattered tall buildings of fireproof construction standing in the midst of a mass of old buildings of very inflammable construction; whereas, in lower New York, the greater part of the older office buildings are of semi-fireproof construction, erected some twenty-five or thirty years ago; while from the midst of these rise modern steel buildings built according to the most approved methods of modern fire protection. Should a fire assuming the proportions of a conflagration start in the lower part of lower New York, it would find no such mass of highly combustible material to feed upon as it swept toward the tall building district, and when it reached the latter, it would be brought up against a curtain generally some 300 feet in height, and frequently a block in depth, which would prevent the onward sweep of it until the Fire Department, massed from all over the city, had got it under control. Although we have no wish to decry the undoubted fire risks which do exist, we believe that to state, as the president of the Board of Fire Underwriters has done, that the whole skyscraper district would be wiped out, is to discredit the modern system of fire protection as such, just at the very time when the public is being brought to realize that the only rational system of construction is one that cannot be destroyed by that greatest of modern destructive agencies, fire.

Such fires as have occurred during the past few years in office buildings of thoroughly up-to-date construction (except, of course, in the cases of Baltimore and San Francisco) have been limited to the building, if not to the very floor on which the outbreak occurred. Residents in New York will recall to mind the case of the Home Life Building, a sixteen-story structure on Broadway, which was attacked at the ninth floor by the flames from one of the old style of construction buildings adjoining. The fire passed through the upper eight stories, burning the woodwork and furniture, but leaving the lower eight stories intact. The essential structural portion of the building was so little injured, that in two weeks' time repairs had been made and the whole building was ready for occupancy. The Home Life Building having been constructed several years ago, did not embody some of the very latest ideas in fireproof construction, such as metal window sashes and wired glass. Had it possessed these in addition to outside steel shutters, the building would have been absolutely secure against attack. Indeed, in commenting upon the alarming prophecy of the destruction of lower New York, Mr. Fitzpatrick, of the International Building Inspection Society of Washington, states that the skyscraper district of New York is about the safest place from fire in the entire country; and that if the owners of the buildings would but put wired glass in metal sash in the windows, where they have not already done so, that district would be so safe that little or no insurance would need to be carried upon those very buildings whose ultimate destruction is predicted.

At the same time, there is no denying that the fire departments are looking with much misgiving upon the present tendency to carry the tall building up to unprecedented heights. They point to the fact that in the case of a structure like the Singer tower, which is over 600 feet in height, the firemen would be able to reach only a few of the lower stories directly from the street. Of course, in the case of an outbreak, the security of such buildings is dependent upon the extent and quality of the fire-fighting apparatus installed as part of the equipment of the buildings themselves. It is imperative that the fire-fighting plant should be such as to permit of a very speedy attack, with an ample pressure of water, upon any floor of the building throughout its entire height; and provision should certainly be made for cutting off any floor upon which a fire may start from the stairways and the elevator shafts. In a building 600 feet in height, the upward draft through the elevator wells, supposing that there was direct communication from a burning floor to the shaft, would be of enormous strength; and the fierce rush of air would, of course, add greatly to the intensity of the heat. On the other hand, it would be quite possible, by means of sliding doors or other suitable means, to cut off a burning floor from the elevator well or other vertical opening. If in addition to this, the interior woodwork, sashes, doors, and trim were entirely replaced by metal work, the risk of fire, even in a building of the height of the Singer tower, might be considered to be absolutely eliminated.

IMPORTANT ADDITION TO NEW YORK CITY'S WATER SUPPLY.

When it was realized, in the summer of 1904, that emergency measures must be taken at once if New York city was to be rendered safe against the perils of a water famine, steps were quickly taken to provide additional reservoirs in the Croton watershed, to afford an additional amount of eighteen billion gallons beyond the storage capacity of the then recently completed Croton dam. The first of these new reservoirs has recently been completed, and its rapid erection is in gratifying contrast with the interminable delays which have seemed to be inseparable from large municipal undertakings of this kind.

The new reservoir dam has been built over the Cross River near Katonah, and it serves to impound the waters of this river and its tributaries. The plans of the structure were approved February 7, 1905, and the contract was awarded on June 20 of the same year, so that the whole work has been completed in about two years' time, and this in spite of the fact that because of an injunction brought by certain Tammany interests, the work was delayed for fully five months. We mention this fact because the contract was awarded to the contractors who have recently received the Ashokan Dam contract—a twelve million dollar job. If the firm exhibit the same celerity in the larger contract that they have in the smaller, there is every prospect that a portion at least of the new Catskill water supply will be available for city use by the year 1912.

The Cross River is impounded by a dam which is 900 feet in length, 170 feet in depth from crest to foundations, and contains about 160,000 cubic yards of masonry. The Aqueduct Board allowed twenty-six months for the completion of the dam; and hence it will be seen that, despite the injunction, the contractors have finished the work well within the contract time. The capstone of the dam was laid on August 7 by the Mayor of New York; who thus becomes still further identified with the improvement of New York city's water supply, a work with which his name will always be honorably associated in the annals of the city. The water at once began to accumulate in the reservoir back of the wall; but owing to the drouth, the rise of level was at first very slow, although the rather heavy rains of the present month are producing a more rapid rise. It is confidently believed that the construction of this and a reservoir of about the same capacity, each holding about nine billion gallons, will serve to tide the city over any possible dry season which may occur during the next five years—or until the waters of the new Catskill supply can be brought by the new aqueduct to Croton reservoir to augment the supply through the new Croton aqueduct.

OBSERVATIONS OF MARS DURING THE RECENT OPPOSITION.

For some unaccountable reason there seems to be a strong prejudice among both scientists and laymen against acknowledging the existence of a race of intelligent beings upon any planet other than our own. We cannot help thinking that our earth is the most favorably situated of the solar system, and is the best suited to support life. To be sure, this is so as regards life with which we are familiar; or to state it more correctly, the animal and vegetable life of this earth has adjusted itself, its habits, and its requirements, into harmony with conditions already fixed upon earth. This is no argument that life cannot adjust itself to conditions such as are found on other planets.

Those laymen who expected that the question of life on Mars would be settled by observations during this summer's favorable opposition, were predestined to disappointment. No one who is familiar with the subject expected as much. It is highly improbable that we can ever prove with mathematical accuracy that animal life does exist upon the planet. It is far easier to prove the existence of vegetable life by the seasonal changes in the color of large fields or forests. If these areas of vegetation show any unusual configuration and arrangement such as the "oases" and "canals" or "lanes of vegetation" on Mars, it is not unreasonable to argue that the vegetation is being cultivated or regulated by a race of intelligent beings. At the same time, the existence of such beings is not infallibly proved by such evidence. The best that Prof. Lowell expected to do this summer was to corroborate his previous discoveries, and make further observations along the same line. This he reports to have been successful in accomplishing. With the aid of photography he has established beyond doubt the existence of a delicate tracery of lines on the sphere. In addition to this, he finds that the southern hemisphere, which has heretofore been unfavorably situated for observation, is also crossed with a similar system of so-called canals.

There has been considerable criticism by prominent astronomers of the work done by Prof. Lowell as given out in his preliminary report. In reply to this criticism, Prof. Lowell states that he is a specialist in the study of Mars, and he is better fitted than others of his own profession to judge of the conditions on that planet. This idea of specializing in astronomy may appear to be somewhat new, although it is not at all unreasonable. No other branch of science presents so large a field of investigation, particularly in these days of the spectroscope, which instrument permits us to come into intimate contact not only with the members of our own solar system, but with the composition and daily motions of the immeasurably distant stars. Other sciences are divided into special branches with their acknowledged experts and specialists. It is only reasonable to so divide the work of the astronomer. It is not everyone who can see the canals of Mars, even through the best of telescopes. It requires a practised eye, and one trained to this particular class of work. The telescope which Prof. Lowell uses at the Flagstaff Observatory is not of unusual size, and is not used to the limit of its power. It is impracticable to use a power of more than a few hundred diameters, because atmospheric disturbances are equally magnified, and to such an extent that the delicate lines on the planet are lost. This being the case, it appears that we have about reached the limit of the possibilities of the telescope, and what further discoveries are made on the planet will be due, not to more powerful lenses, but to keener eyesight and more experienced observation; in other words, to the work of a specialist.

CRACKED CAR AXLES.

The method of lighting railroad cars by electricity generated by a dynamo driven from one of the car axles is increasing in the United States. According to the Electrical Review, the positive danger of drilling holes in the axle when attaching the equipment has not been realized, though it is generally understood to be inadvisable. The fact that a drilled hole will prevent the spreading of an incipient crack is well known, and often taken advantage of; but it does not seem to be as widely known that sometimes a crack may be started by a drilled hole. In any material subject to alternating stresses cracks may appear where there is an abrupt change of sections; or where a notch has been made by a cutting tool in a turned surface.

In two recently fractured axles the break occurred through the center of shallow holes, which had been drilled to receive the point of a set screw. The diameter of the axle fractured was in each case 3¼ inches, and the breaks occurred after running 15,380 and 13,900 miles respectively. The cracks were several inches from the keyseats, and at points where the stress would not be maximum. As a result of these breaks, set screws have been superseded by a pair of clamped plates gripping the axle and bolted to one another.

Where axles have been drilled, however slightly, they should be carefully inspected from time to time, to discover any cracks as soon as they appear.

Some years ago a fleet of British colliers was sunk during a storm in an English harbor, and remained under water for five years before being salved and brought to the surface. An examination of the coal showed that it had kept its value for steam purposes, and this led to some experiments by the naval authorities, which settled beyond all doubt that coal stored under water did not deteriorate as when stored in the air. Taking heed of this conserving power of water, the Western Electric Company is building flooded coal pits at its plant at Hawthorne, Ill. The excavation is 320 by 75 feet and 12 feet deep, built of concrete, and divided into twelve pits. The coal is dropped directly from the cars, which pass over the pits, and the fuel is removed when desired by means of a steam shovel.

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