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**THE SCIENTIFIC AMERICAN SUPPLEMENT**

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## THE METROPOLITAN WATER COMPANY'S PROPOSAL.

Some seven or eight years ago Mr. John Lockwood, hydraulic engineer, proposed what seemed at the time rather a startling scheme for introducing into the heart of New York a vast body of salt water to be used for putting out fires, and also for the highly sanitary purpose of flushing the sewers and thoroughly washing the streets. As the plan was decidedly novel, it took some time for people to thoroughly digest it, and considerable time before they became at all enthusiastic over it. It appealed very favorably, however, to Mr. William J. McAlpine, the civil engineer who built the Chicago Water Works, and his indorsement has done much to make the scheme popular. The enterprise has now been taken up by a corporation known as the "Metropolitan Water Company," under the presidency of Mr. Charles Spear, and it proposes to carry out Mr. Lockwood's plans as speedily as possible, provided a satisfactory arrangement can be made with the city authorities.

The territory to be included in the operations of the new corporation includes the entire island from the Battery to 59th Street, which means at the present time all the thickly settled portion of the city. At every point in this large area, it proposes to make an irresistible volume of water available at a moment's notice, so that anything like an extended conflagration, such as has visited Chicago and Boston, and even parts of New York, would be almost impossible. Such immunity from what is now an ever present danger is a large enterprise, and its accomplishment means the employment of powerful agents.

The main factor in Mr. Lockwood's plan is a massive tower of brick and stone, 100 feet in diameter and 350 feet in height above tide water. This is to be located about midway between the Battery and 59th Street, and Union Square has been mentioned as a suitable neighborhood. An alternative construction is a stand pipe 80 feet in diameter, and 350 feet in height, having a capacity of 12,000,000 gallons of water. This immense reservoir is to be kept filled with salt water from either the Hudson or East River, or both, by means of triplicate sets of pumping machinery having in the aggregate a capacity of 1,750 horse power. From the reservoir lines of pipe will radiate in all directions. These will vary in diameter from 8 to 20 inches, and will be connected by crosspipes of 10 to 36 inches every half mile. The hydrants will be ready for constant use, and will be so placed that no fire can occur at a distance from them of more than 490 feet. Twenty-eight hydrants could be brought to bear on any fire with hose varying in length from 100 to 500 feet in length, and as each has four openings, this would give 112 streams.

Using longer hose, but not exceeding 1,000 feet in length, 68 hydrants, or 272 steamers, could be made available. The head of water thus brought to bear against the flames will equal 300 to 350 feet, less the elevation of the locality above tide. Such a vast body of water would of course be needed only in time of widespread conflagration, but when such a need arose, it would be great enough to warrant almost any expenditure in having the water at hand. But it is proposed to utilize this abundance at other times in thoroughly washing the streets in all parts of the city, and consequently in flushing the sewers, salt water being an excellent disinfectant.

Such in brief is the plan of the Metropolitan people, and there is undoubtedly much to be said in its favor. The supply of water from the Croton is not abundant for so large a city as New York, and when it is diverted in any amount for fire necessities, the quantity available for domestic purposes becomes inconveniently small. Nor is its volume sufficient to cope with a conflagration of any size, and we are exposed at any moment to the danger of a devastating fire without the means for holding it in check.

The sanitary advantages of the plan are much to be commended, for besides the great comfort of a clean city, experience everywhere has shown that filth offers the best possible conditions for the spread of disease.

There are several practical objections to the plan, which will require careful study before it can be carried into operation, but these doubtless can be readily overcome. In the lower portions of the city, where the water would be under full head, the force of a stream several inches in diameter might be irresistible in other ways than fire extinguishing; caution would be necessary to prevent the large force evoked to fight the flames from spending itself in less desirable directions.

With a full reservoir, and making due allowance for friction of the water in the pipes, there would be many hydrants where the head of water would amount to 300 feet. This means a pressure of 10 atmospheres, or 150 pounds to the square inch, which would require good materials and careful workmanship to keep the system in order and make it effective.

The Metropolitan Company offers to furnish all the necessary plant at its own expense, provided that it gets a contract from the city for a definite term of years, and a specified price per annum for each hydrant. It is understood that no rental is to be paid until the work is completed, and the water ready for use. The proposal is still under discussion, and as yet no definite agreement has been reached.

## SPEED ON THE OCEAN.

Quick passages across the ocean, such as those recently made by the Etruria, have little to commend them unless they are made in clear weather. Running at high speed in thick or foggy weather is both perilous and unlawful. The International Code of Rules to be observed at sea says distinctly that steamers must run at a "moderate" speed in thick or foggy weather, else they invite danger, not only to themselves, but also to the vessels which may be in their path. When it is remembered that one of these greatships while at full speed will run several miles before she can be brought to a full stop or turned a few degrees to the port or starboard, the absolute necessity for slow running in thick weather is obvious. None suffers so much from these fast trips as the brave fellows who man the great fleet which supplies the whole country with fish. The vessels of this fleet are always to be found lying at anchor or hove-to in the tempestuous seas which continually run across Georges and the Grand Banks.

It is dangerous work lying on these exposed banks at the best of times, for the holding-ground, being shifting sands, is bad, the seas high, and especially in the winter season the winds are fierce. But add to these dangers the continual passing to and fro of a fleet of fast-going ships bent on making time, and the chances of disaster are greatly increased. Rarely a season passes that one or more of these fishing vessels, carrying from 15 to 20 men, are not cut down by the iron prows of the transatlantic liners, and a score of families in the Gloucester hills put in mourning.

The heartlessness exhibited at times by the masters of some of these ocean "greyhounds" would be incredible, were it not corroborated as well as it is. One of these ponderous iron ships can cut down a fishing schooner of fifty tons without awakening its sleeping passengers. A slight shock passes through the ship, and all is over. If the gale is blowing, the shouts of the fishermen, struggling in the water, will not be heard below the main deck, and even then only for an instant as the great ship rushes by. Sometimes, so the fishermen say, the commander will stop his ship, and sometimes he will not. Under the usual conditions of weather obtaining on the Banks, it makes little difference whether he does or not. For one of these ships when at full speed will, as said before, run several miles ere she can be brought to a full stop, and before the boats can be launched and sent back it is usually too late; the men in the water having gone down, or been lost to sight in the rolling seas.

Article 18th of the International Code says: "Every steamship when approaching another ship so as to involve risk of collision shall slacken her speed, or stop and reverse if necessary." In these and all other rules to be observed at sea, there is a clause which warns masters of steamers to run slowly, or even stop and blow their whistles, when in thick weather and in a vicinity where usually many vessels are to be found. Hence when the masters of the so called ocean greyhounds run at full speed over the Banks in thick weather, they willfully disobey the law, and wantonly imperil the lives of the fishermen.

There is another side to this, and one that directly concerns the safety of the passengers themselves. The danger of encountering icebergs in the spring and summer upon the ocean highways is always more or less imminent, and this danger increases as the speed of the ship. The thermometer furnishes a fair warning to a trained eye of the vicinity of icebergs *when they are to windward* of the ship, that is, when the wind is blowing from the ice toward the ship; but when they are dead to leeward, the thermometer has been shown to furnish little or no warning whatever, and to be little better than useless.

It is but fair to say for the Cunard Company, the owner of the Etruria, that for a long time it held itself aloof, and maintained the reliable and conservative course of making safe rather than quick passages; reducing the dangers of the Banks to a minimum by adopting the longer but far safer course to the south of this domain of fogs, icebergs, and fishermen. But the demand for quick passages grew apace; the swift-footed ships of rival lines were eagerly sought after by the general public, and quarters in these for the passage commanded high figures. This brought on an attack of the quick-passage fever of the most virulent type; the old and safer Cunard Company exchanged the longer but safe passage for the shorter one over the Banks, bought the Oregon, built the Aurania, Umbria, and Etruria, and is now apparently outstripping its rivals in the very course which heretofore it so strenuously condemned.

FARADAY proved the magnetic condition of all matter, and that magnetism, unlike electricity, cannot be insulated.