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SCIENTIFIC AMERICAN SUPPLEMENT

No. 1003.

For the Week Ending March 23, 1895.

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THE NIAGARA AERIAL TRAMWAY.

While the harnessing of Niagara may rank as one of the engineering triumphs of the age, it certainly cannot rank as one of its æsthetic triumphs; but now a new scheme for attacking poor Niagara has been evolved, this time not in the interests of commerce or of manufacturing industry, but simply as a money-making scheme based on the curiosity of the public.

The Aerial Tramway Company proposes to erect towers on each side of the Falls, one in the Canadian and the other in the American park, and to carry from tower to tower a double set of steel cables, which are to be traversed by cars suspended therefrom and operated by electricity from the American side of the Falls.

The cars, which are to be open, cage-like structures, will traverse the Falls about 30 feet above the edge, so as to give the sightseers a close inspection of the water where it takes the mighty plunge. The line will follow closely the brink of the American Falls to Goat Island, the prolongation of which direction will carry it as a chord to the Canadian or Horseshoe Falls.

The State of New York and the Canadian government have both established parks for the preservation of the natural beauty of the Falls, which were fast becoming impaired by vandalism. When the necessary powers were obtained for the establishment of these reservations, every lover of the beautiful in nature felt relieved to think that Niagara was saved, but it is questionable if in the worst of its days a greater act of vandalism was contemplated than the construction of the aerial tramway. The natural conformation of the ground about the Falls enables the visitor to approach close to the edge of the Falls and to see to an unusual advantage the great cataract. A nearer approach to its brink than that afforded by nature is not desirable, and the stretching of cables across the chasm in full view, to be traversed by cars, will be the greatest defacement to which the scenery has ever yet been subjected. Those who advocated the parks, and perhaps worked for their establishment, will regret to see them surrendered to such uses as the location for towers of the tramway.

ACETYLENE.

No recent chemical discovery has excited more interest than the direct production of acetylene. The calcium carbide process may properly be termed direct, for in it the carbon is first united to calcium and secondly to hydrogen, the calcium being supplied by lime and the hydrogen by water. We have given a number of papers on the subject, and the new process is now being presented in various exhibits, lectures and papers to the public. One private residence in this city has a small acetylene plant with which the house can be illuminated or which can be used to enrich the ordinary gas. If the calcium carbide can be produced commercially—and its promoters state most positively that it can be so produced—it will have a great effect upon the production of artificial light.

Political economists, who have devoted some thought to the influence of modern scientific progress upon the condition of the world, recognize in the modern development of artificial illumination one of the most powerful instruments for the civilization of mankind. In old times the dark streets of cities were dangerous, because they were haunted by robbers, who only lacked subjects because the people were afraid to go abroad after dark. When Argand invented his cylindrical lamp burner with central draught, he made one of the great steps forward in artificial lighting. The invention of plaited candle wicks, chemically treated, which, as the candle burned, would bend over and burn away, was considered a great discovery and achievement in its day, as doing away with snuffers. Then gas was introduced and proved to be the greatest civilizing agent for cities. When the streets were adequately lighted, crime at once diminished.

In recent years the electric arc light has proved the best street illuminant, but gas or the incandescent electric light remains the favorite indoor illuminant. In the co-development of gas and electricity some interesting cycles or transformations of energies have resulted or have been worked out. Gas is primarily made for the purpose of giving light. When burned in the explosion gas engine it gives, from the physicist's standpoint, a far more economical result than is attainable with the steam engine. In the commercial sense the economy, owing to the high cost of gas, disappears.

The gas engine burns some twenty feet of gas per horse power hour, which gas represents an illuminating power of sixty to one hundred or more candles. For the production of such gas four pounds of bituminous coal suffice, which give also as side products a material amount of coke and a quantity of coal tar. If a gas engine drives a dynamo, we may get from it in incandescent lights as much or more candle power than from the original gas burned as such, while if we use arc lamps the production would be vastly increased. In the new acetylene process, a similar but more complicated cycle exists. Power is expended in producing an electric current. The current is led to an electric furnace, where it heats to an almost immeasurably high temperature a mixture of lime and carbon. The lime is reduced and gives calcium carbide. This substance is treated with water, and every pound evolves five cubic feet of acetylene, enough to give 250 to 300 candle power of light for one hour.

Thus if we know how much horse power is expended per hour in producing a definite yield of the calcium carbide, we can compare the economy of the different cycles. As a matter of figures it is enough to say that they come out about the same. But the new product effects other results. It diminishes the minimum size of gas holder required for the usual exigencies of gas supply. A one-foot burner gives perhaps forty candle power, or as much as ten feet of ordinary gas would give. Hence a gas holder of one-tenth the ordinary size could be used. The new gas is made without heat, and without any dangerous agent such as gasoline. Finally, when the gas is made it is a permanent one. The utter simplicity of the apparatus and process is also striking.

One of the curiosities of the carbide is that it will not burn. It can be drawn out white hot from the electric furnace and cast in moulds. A piece can be held in a Bunsen burner without the least effect. But if a drop of water is put upon the stony substance it effervesces, and the gas can be lighted and will burn like a piece of wood for a few seconds until the water is exhausted. Then it goes out.

Merely as a matter of scientific interest it is to be hoped that the commercial production will soon be accomplished. The merciless judgment of the balance sheet has wrecked many a most ingenious scientific triumph. It is to be hoped that acetylene will fare better.

The Craig Colony for Epileptics.

The managers of the Craig Colony for Epileptics, at Sonyea, N. Y., have recently published an interesting report of the work so far accomplished in fitting out the home. During the year considerable progress has been made. In 1894, the Legislature of New York appropriated $140,000 for the establishment of the colony, and of this amount $12,000 has been expended in purchasing the farm which is to form the site of the colony, and in protecting and improving the property. A general design for the colony has been adopted to which all buildings and improvements will be obliged to conform, and architects and engineers, surveyors and others have been employed to carry out these plans. It is proposed to construct first an administration group of fine buildings. These are to be plain two-story structures, entirely disconnected and devoid of all "institutional" features, the whole resembling a cluster of private dwellings. The chief buildings of this group will contain the offices of the superintendent and members of his staff, and it will be here that the patients will be first received. Two of the buildings will be hospitals, one for each sex, and two will be used to accommodate patients before they are distributed in the colony. The idea is to provide the most homelike conditions. The minor offices and wants of the colony will be provided for by the patients themselves.

The designs of the respective buildings will vary from each other in detail and in outline. Everything will be done to prevent the colony from having the appearance of an institution. The home life will be further maintained by providing a dining room for each respective building. The patients from the several buildings will not, in any case, be massed together. There will also be separate buildings, to be known as sewing cottages, laundry cottages, etc. The farm at Sonyea comprises nearly 1,000 acres of excellent land, and much of this will be cultivated. The place will also be beautified by a tasteful arrangement of driveways, lawns, trees, and shrubbery.

Such an institution as is being here provided has for a long time been very badly needed. The State now makes provision in separate institutions for the insane, the blind, the deaf and dumb, and others suffering from chronic maladies. It is no less important that provision should also be made for epileptics. It is estimated that there are 12,000 epileptics in the State of New York. Of this number some 400 are confined in insane asylums and 600 in poor houses. The colony at Sonyea will doubtless correct this abuse. Its surroundings will, besides, be unusually healthful, and its atmosphere as far as possible homelike, and, therefore, restful and beneficial. The plan of providing an epileptic colony is already in successful operation in England, France, and Germany, where much good has been accomplished.

New Torpedo Catchers.

The Banshee, one of the three torpedo-boat destroyers built by Messrs. Laird Brothers, Birkenhead, recently made a successful trial, attaining a mean speed on six miles of 27·97 knots, and for the three hours' running 27·6 knots, being more than half a knot in excess of the contract speed. Exhaustive trials of steering, both ahead and astern, at full speed were also carried out with satisfactory results.