

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT NO. 37 PARK ROW, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year postage included. \$3 20
One copy, six months, postage included. 1 60

Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at \$3.20 each; additional copies at same proportionate rate. Postage prepaid.

Remit by postal order. Address

MUNN & CO., 37 Park Row, New York.

The Scientific American Supplement

Is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, \$5 00 a year, postage paid, to subscribers. Single copies, 10 cents. Sold by all news dealers throughout the country.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, postage free, on receipt of seven dollars. Both papers to one address or different addresses as desired.

The safest way to remit is by draft, postal order, or registered letter. Address MUNN & CO., 37 Park Row, N. Y.

Scientific American Export Edition.

The SCIENTIFIC AMERICAN Export Edition is a large and splendid periodical, issued once a month. Each number contains about one hundred large quarto pages, profusely illustrated, embracing: (1.) Most of the plates and pages of the four preceding weekly issues of the SCIENTIFIC AMERICAN, with its splendid engravings and valuable information; (2.) Commercial, trade, and manufacturing announcements of leading houses. Terms for Export Edition, \$5.00 a year, sent prepaid to any part of the world. Single copies 50 cents.

The SCIENTIFIC AMERICAN Export Edition has a large guaranteed circulation in all commercial places throughout the world. Address MUNN & CO., 37 Park Row, New York.

NEW YORK, SATURDAY, JANUARY 8, 1881.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as Adirondack survey, Agricultural inventions, Atlantic cables, and various technical reports with their respective page numbers.

TABLE OF CONTENTS OF

THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 262,

For the Week ending January 8, 1881.

Price 10 cents. For sale by all newsdealers.

Detailed table of contents for the supplement, categorized by I. ENGINEERING AND MECHANICS, II. GEOLOGY, MINERALOGY, ETC., III. HYGIENE AND MEDICINE, IV. PHYSICS AND CHEMISTRY, V. AGRICULTURE, ETC., and VI. MISCELLANEOUS.

THE ELECTRIC LIGHTS ON BROADWAY, NEW YORK.

In our issue dated December 25 mention was made of preparations going on for the experimental lighting of a section of Broadway with electric lamps. The promises of the company making the test—the Brush Electric Light Company, of New York—were fulfilled somewhat ahead of the time fixed, and on the night of December 19 the twelve blocks between 14th and 26th streets, including a portion of Madison square, were lighted by sixteen lamps on a single circuit. Although there were already in use in this city, in private establishments, something like a hundred Brush lamps, this was the first application of them to street lighting here, and the experiment naturally attracted much attention. The company proposes to continue the exhibition of the lamps for a month or more, keeping a careful record of the several elements of cost, so that an authoritative decision can be arrived at touching the economy of the system and its ability to take the place of gas in the lighting of our streets. That the electric light is very much cheaper than gas, quantity for quantity, is already abundantly demonstrated and pretty generally recognized; the question to be determined now is whether the vastly brighter illumination demanded when electricity is used, and is really needed for the satisfactory lighting of our streets, can be had at a price which the public is willing to pay.

The difference in the degree of illumination obtained under the two systems is far greater than is popularly supposed. In the section of Broadway lighted by electricity there are sixteen lamps—each of 2,000 candle power—each having at least twice the illuminating power of all the gas lights hitherto used there. Anywhere in the electrically illuminated district it is possible to read type of the size used in the SCIENTIFIC AMERICAN, and the light is purer and more steady than any gas light. Yet the popular impression at first was that the electric light was a trifle dim, and that the lamps should have been placed nearer together.

The company making this experiment was organized under the laws of this State some time last fall, its field of operation being limited to Manhattan Island. As already noted, the Brush system of lighting had been adopted in quite a number of our larger mercantile establishments, and many other merchants and manufacturers favored its introduction, but did not require lamps enough to warrant the purchase of separate generating machines. The success of the system elsewhere made it probable that it would be as favorably received here, and that its general use might be extended not only to the larger shops, warehouses, factories, etc., but also to the public streets and parks. Accordingly the New York company was organized to develop the field. The district selected for the first central station includes a large number of prominent hotels, club houses, theaters, and other places of amusement, and covers what has become the chief shopping district of the city. Seeing the favorable issue of the first street experiment, it is safe to infer that the future progress of the electric light in this city will not be slow. At this writing the wires have been set up as far as 34th street, and it is expected that the company will be officially invited at an early day to submit a bid for the lighting of the square mile of territory around the central station.

Ample preparations are making at the preliminary station for the extension of the system. Already half of a double Corliss engine of 200 horse power has been set up, with three dynamo machines, each capable of sustaining sixteen lamps of 2,000 candle power. Foundations are being prepared for half a dozen more machines of the same size, and one 40-light machine. With the latter type of machine the power required is four-fifths of a horse power to each lamp; with the smaller machines it is a little more, though it is estimated that the completed engine will be able to supply 250 lamps of 2,000 candle power each.

The lamps are of simple construction, very plain in appearance, relatively inexpensive and easy to keep in order. The street lamps are provided with two sets of carbons, each good for eight hours' burning, and so adjusted that when one set is exhausted the current shifts to the other. No clockwork is employed in feeding the carbons, their movement being effected by a simple automatic electric arrangement, which secures a constant adjustment and a remarkably steady light.

It is evident that the contest between gas and electricity for the lighting of our streets has now passed from the theoretical to the practical stage. It is tolerably clear, too, that popular sympathy has a decided leaning toward electricity. It is to be hoped that on the score of cost the tests will result as favorably as they have in respect to the quality of the light.

GROOVE TRACK PAVEMENT.

In his much repeated lecture on "Lost Arts," Mr. Wendell Phillips describes an ancient roadway—Assyrian, if we recollect aright—which was made of stone blocks grooved for the wheels of wagons.

Something similar would seem to be proposed by the Groove Track Pavement Company, of this city, which has applied for permission to place in lower Broadway and the streets leading therefrom to the ferries a complete equipment of five sets of tracks, with three tracks in each set to suit the gauge of every kind of vehicle. The petitioners also ask the privilege of constructing an experimental set of tracks in Union square, as "an entering wedge" toward laying in every street in the city such tracks as would permit the use of compressed air as a motor for all sorts of vehicles. Whether these tracks are to be accounted public

highways does not appear, though if they are not it is obvious that the public would not long be left with any usable portion of their own streets, should the petition be granted. The petitioners further ask for the privilege of running light and convenient vehicles for carrying passengers and baggage, at a speed not exceeding 20 minutes from Union square to either of the ferries; vehicles to be run at intervals of two minutes; and the fare to be 5 cents, to include the carrying of 50 pounds of personal baggage. The fare, they say further, is to be prorated with all connecting omnibus and horse railroad lines that desire this arrangement, and excluding and prohibiting all other vehicles from carrying passengers, except such as now run in Broadway. In consideration for this decidedly valuable grant, the Groove Track Pavement Company proposed to keep the streets in which their tracks were laid well paved, tracked, and cleaned from dirt or snow, and to pay into the City Treasury one cent for every full fare collected, this amount to be allowed to taxpayers occupying the property bounding the said streets by a corresponding reduction of their taxes.

The scheme is put forth ostensibly for the relief of the blocked and crowded condition of Broadway. It is clear that it would put an end to blockades—by driving off the street all vehicles not owned or licensed by the Pavement Company. The business firms along Broadway would doubtless prefer an occasional "block."

AN UNWISE PHYSICIAN.

There have been no nobler instances of self-sacrifice than those recorded of physicians who, to save a patient or to investigate a disease, have taken extreme risks at the cost of their lives. There is, however, a reasonable limit to such experiments, and no physician is warranted in subjecting himself to needless hazards. If the object aimed at can be gained without incurring any special risk it is obviously the part of wisdom to choose the safer way. The spirit which impelled young Dr. Sanford to choose the more dangerous way, and so lose his life, at Greenpoint the other day, was beyond question commendable; but his act was the reverse of justifiable.

As the case is reported, Dr. Sanford had been attending a child afflicted with malignant diphtheria, watching the patient day and night. At last the air passages became blocked, and the doctor resorted to the use of the knife. He made an opening in the windpipe, inserted a small rubber tube, and with his mouth drew out the poisonous fluid. By this act he prolonged the child's life several hours, but put an end to his own life.

This is not the first fatal instance of the sort which has occurred in this country, and two or three cases of the same nature have been reported in France. The infectious character of the diphtheritic excretion is well known, and Dr. Sanford knew that his life would possibly, if not probably, pay the forfeit for his professional zeal.

Ought he to have taken the risk? More specifically: can we justify his taking the risk?

We have no hesitation in answering, "Certainly not!"

For the simple reason that the deadly matter could have been as promptly and as surely drawn off by purely mechanical means. The emergency was not a sudden one, or one that could not have been provided for beforehand. In any apothecary shop the doctor might have bought for a few cents a rubber bulb that would have served the purpose of an aspirator as well as his own mouth, and it would not have suffered infection from the poisonous matter drawn into it.

Our natural admiration for devotion carried to the point of self-sacrifice is apt to make us forget to ask whether the devotion might not better have been manifested in a more rational and equally effective way. In Dr. Sanford's case we think it might.

INTERNATIONAL EXCHANGE OF FOOD FISH.

While the German carp is being domesticated among us, converting our shallow fishless ponds into reservoirs of wholesome food, several useful fish of this country are being introduced into German waters. Recently 250,000 eggs of the delicious white fish of our great lakes were shipped by the U. S. Fish Commission to the German Fisheries Association, of Berlin. The eggs came from the United States hatcheries at Northville, Mich. The 700,000 eggs of the California salmon, shipped to Germany, France, Holland, and England some months ago, all arrived in good condition. Brook trout have also been sent to Germany, where they can scarcely fail to thrive. Germany has sent us the carp, in return, and also the golden ide, a beautiful and promising fish, which is under cultivation in the ponds of the Maryland Fish Commission.

It is expected that the Berlin Association will send, in addition to the species which have already been received from them, eggs of the saibling or charr, the large and handsome trout peculiar to the deep lakes of Northern Europe. It is highly esteemed as a food fish, and in Lake Constance it sometimes attains the weight of twenty-five pounds.

TEMPORARY DEAFNESS.

According to Dr. H. Augustus Wilson, a very common cause of deafness is the hardening of wax in the ear and the unscientific plan that people adopt for its removal. They generally succeed in making a bad matter worse. The ear is not so exquisitely sensitive to the presence of foreign matter as the eye, and hence those who work at the ear with hairpins and toothpicks are likely to injure themselves irre-