

## SCIENTIFIC AMERICAN

ESTABLISHED 1845

MUNN &amp; CO., Editors and Proprietors

Published Weekly at

No. 361 Broadway, New York

## TERMS TO SUBSCRIBERS

One copy, one year for the United States, Canada, or Mexico, \$3.00  
 One copy, one year, to any foreign country, postage prepaid, £0 16s. 5d. 4.00

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Scientific American (Established 1845).....\$3.00 a year  
 Scientific American Supplement (Established 1874)..... 3.00  
 Scientific American Building Monthly (Established 1855)..... 2.50  
 Scientific American Export Edition (Established 1875)..... 3.00  
 The combined subscription rates and rates to foreign countries will be furnished upon application.  
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 MUNN & CO., 361 Broadway, New York.

NEW YORK, SATURDAY, AUGUST 9, 1902.

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.

## A GREAT ENGINEERING FEAT COMPLETED.

With the laying, on the first day of the present month, of the last coping stone of the great dam across the River Nile at Assouan the ancient land of the Pharaohs sees the completion of a national work, which is not only the greatest of its kind in existence, but in its beneficent results will probably outrank any scheme carried out in Egypt, either in ancient or modern times. The completion of this dam and a similar structure at Assiout will provide in the Nile valley a vast reservoir capable of supplying over a billion cubic yards of water every year. The surplus waters of the river will be stored during the flood season, and then drawn upon for the irrigation of wide tracts of land which for many centuries past have lain waste for want of water. As a result of the new system of irrigation, there are extensive tracts of land which henceforth will bear two crops a year where formerly they bore but one; while the area devoted to sugar cultivation will be greatly increased. The Assouan dam itself is one of the greatest engineering works in existence. It is no less than 1 1/4 miles in length and it is pierced by 180 sluice gates 25 feet in height and 7 feet in width, by means of which the regulation of the waters will be secured. The total cost of the two dams will be about \$25,000,000, and the work has already proved itself to be an important economic feature in the life of the Egyptian people, for no less than 14,000 natives have found continuous employment during the progress of the work. The inauguration and rapid development of this great scheme have been due entirely to the enterprise of a western race, entirely alien to the Egyptian people; and there is something peculiarly fitting in the fact that Egypt, which contributed so largely in its earlier days to the world's arts and sciences, should in these later times be thus richly endowed by the highly-developed engineering skill of our modern civilization.

## THE HALIFAX ROUTE TO EUROPE.

It was an inevitable outcome of the powerful shipping combine which has recently been brought about among the steamship companies plying between the United States and Europe that some attempt should be made to develop a rival combination with facilities that would enable it successfully to compete for the transatlantic trade. Inasmuch as the strength of the position held by the combine lies in the fact that it has the great railroad systems of the United States at the back of it, it was evident from the first that any competing interests must also have behind them a transcontinental road. Such a road exists in the great Canadian Pacific system, which provides a through transcontinental service from Vancouver on the Pacific to Halifax on the Atlantic. The latter port of call has a distinct advantage over the port of New York in the fact that it is over a day's steaming by the fastest liners nearer to Europe, and that it is readily accessible from deep water at all states of the tide.

In view of these facts it is not a matter of surprise that the Canadian government should have recently approached the British Parliament with the suggestion that a line of steamers should be established between Halifax and Liverpool, and that a subsidy of from three to four million dollars should be provided jointly by the Canadian and British governments. The proposal has provoked a natural enthusiasm in Canada, and it seems probable, at the present writing, that it will receive the favorable consideration of the English government. If Halifax be selected as the terminal port, passengers and mails will reach the United States about one day earlier than they do by the fastest ships of the German line at the present time. The speed of the proposed fleet of steamers has not been definitely determined upon, but it will not be less than twenty and may be as high as twenty-three knots an hour, the probabilities pointing to a sustained sea speed of twenty knots for

the faster boats. To the average transatlantic passenger the proposed line should prove particularly attractive, since the competition thus established will serve to preserve passenger rates at their present figure and check that tendency on the part of the steamship combine to raise the rates, which, as we have lately pointed out in these columns, is giving uncomfortable proof of its activity.

## THE MARCONI DISCLAIMER.

To the man who is at all familiar with British and American patent practice, the comments which have appeared in the newspapers on the announcement that Marconi has amended his British patent application in order that Marquis Solari might receive due credit for a certain contrivance, must appear decidedly unjust to the inventor to whom, more than to any other, the practical success of wireless telegraphy is due. Marconi has been placed in an apparently awkward position simply by reason of the peculiar rules that govern patents in Great Britain.

Probably one of Marconi's claims covered Solari's device; and in order that he might not invalidate a patent in which other devices were described, Marconi filed the necessary disclaimer. In the United States, where the filing of a disclaimer is optional, the patent would probably have passed to issue without any gratuitous newspaper criticism. Its validity would have been passed upon by the federal courts in a patent infringement suit; and even if it then transpired that a device covered in one of the claims had been invented by another the remaining claims would still be valid and their infringement would be enjoined by a Court of Equity.

From the meager accounts which have been received it does not very clearly appear what is the nature of Solari's invention. Even if Solari is the inventor of the mercury-coherer, used in combination with a telephone, which is said to have been employed in transatlantic signaling, it still remains to be proved that the entire system which Marconi uses is the result of another's work. Moreover, he announced that the coherer has been abandoned for transatlantic telegraphy. Marconi has so far shown himself an indefatigable and modest scientific investigator, who has spared neither time nor money in practically applying the discoveries of Heinrich Hertz. Although it is true that Branly invented the coherer, that Popoff first used the tall mast, and that many of the important elements of the usual wireless telegraphy apparatus had been invented before Marconi was heralded as the inventor of a new form of long-distance communication, nevertheless the fact remains that to him and to him alone the scientific success of space telegraphy is due; and to him perhaps will its eventual commercial success be credited.

It is not difficult to find a parallel to the battle which Marconi is now waging for recognition of his rights as an inventor. No one would now dispute the title of Morse to the telegraph, and yet the elements of the invention had been devised long before by Prof. Joseph Henry and others. Many an experimenter had labored long in endeavoring to produce an apparatus by means of which it would be possible to converse through long distances. Still, to Prof. Alexander Graham Bell justly belongs the credit of having furnished us with the telephone that bears his name. Given a number of old devices, an inventor ingenious and broad-minded enough to see their possibilities, and persistent enough to combine them into an apparatus capable of performing new functions, and a horde of claimants for the honor of having invented the apparatus evolved will forthwith arise. Such is evidently the usual experience of the successful inventor. Despite the persistent and bitter attacks of Sylvanus Thompson, and the cool disregard of German scientists for the work of Marconi, it seems reasonably certain that he will eventually receive his full meed of credit. A patent infringement suit is generally a thing to be avoided; but in Marconi's case it is almost to be welcomed, for only after a painstaking analysis by a United States Court will it be possible to appreciate fully how great has been the contribution of Marconi to wireless telegraphy.

## FUTURE TRANSIT FACILITIES OF NEW YORK CITY.

The series of weekly discussions of municipal affairs by Mayor Low of this city have shown that he possesses a very thorough grasp of the municipal problems of America's greatest city. A striking instance of this is afforded by his last utterances on the subject of the future transit facilities of New York city, in which he carefully reviews the whole field and indicates in what direction the present various transit system must be enlarged, what connections must be made between them, and what new lines must be opened to accommodate a freight and passenger traffic whose growth is without parallel in any of the great cities of the world.

In reading over the nine pages of Mayor Low's typewritten statement we agree with him in his esti-

mate of the transit situation, with the single exception of his indorsement of the possible abolition of the terminal loop below Forty-second Street station. We cannot but think that the New York Central Company's first design, embracing an electrically-operated terminal loop for suburban traffic, is the best possible solution of the problem at that point.

The paper discusses the whole subject broadly under three heads: Inter-borough communication between Manhattan Island and Long Island; communication with Manhattan Island from the north; and the improvement of the city's commercial facilities by the development of the water front of Manhattan Island.

Under the head of inter-borough communication, the Brooklyn Bridge naturally receives the first attention, and the keynote to the problem is sounded when the Mayor affirms that all bridges, and the Brooklyn Bridge in particular, should be treated as thoroughfares. "They must not only arrive; they must lead somewhere." If our readers will refer to the early accounts of the new East River Bridge, or the Williamsburg Bridge, as it is now called, published in the SCIENTIFIC AMERICAN, they will find that we strongly advocated the treatment of the new bridge as a thoroughfare, and not as a mere short length of railroad connecting two terminal points. Unfortunately, the present Brooklyn Bridge was built on the latter plan, its traffic to be carried by a system of shuttle trains; but the inexorable demands of traffic have practically, as Mayor Low shows in his address, converted the Brooklyn structure into a great railroad thoroughfare. Such it is to-day, such it will ever remain; and, therefore, in view of the fact that the present suspended roadway is loaded up to its safe limits, the proper thing to do is to rebuild the roadway, bringing its carrying capacity up to the strength of the cables and towers, which can sustain much greater dead and live loads than they do at present. The Brooklyn Bridge should be connected directly with the downtown financial districts to the south, with the Hudson River ferries to the west, and with the Williamsburg Bridge to the north. Of these connections a subway road between the Brooklyn and Williamsburg bridges is rightly considered to be the most urgently needed, and should be the first to be constructed. The northern connection is very important, not only as increasing the value of the Brooklyn Bridge, but as bringing the new Williamsburg Bridge, which will probably be opened by the autumn of 1903, in touch with the City Hall, thereby rendering that bridge, in its turn, a railroad thoroughfare. The new suspension bridge No. 3, which will be known as Manhattan Bridge, is to extend in Manhattan Island to the neighborhood of Canal Street and the Bowery, and we agree with the Mayor that the railroads of this bridge should be extended across the city so as to make connections with the west side elevated systems, as well as with those upon the east side. But we think that such connection should be carried underground and not by an elevated structure.

The new Blackwell's Island Bridge terminates at Seventh Avenue and will inevitably make connections with the elevated road, the natural agent for using the Blackwell's Island Bridge being the Manhattan Elevated Railroad, just as the natural agent for using as railroad thoroughfares, the Brooklyn Bridge, the Williamsburg Bridge and the Manhattan Bridge is the Brooklyn Rapid Transit system. The Brooklyn Rapid Transit Company is also the natural agent for using the second Brooklyn tunnel, which should be located so far as practicable to meet the views of that corporation; provided, of course, that the company will do its part in developing such thoroughfare traffic.

In the Mayor's opinion it lies with the New York Central & Hudson River Railroad to solve the problem of giving adequate connection between Manhattan Island and the suburban country to the north of it, and he states that he is authorized by the president of the New York Central Railroad to say that that road is ready to enter into a stipulation with the city (provided the city will approve the changes that they now wish to make at the Grand Central Station) to substitute electricity for steam, not only for their suburban, but also for their through traffic, and that they will sign a contract for the erection of power houses adequate for both of these purposes immediately after the approval by the city of their terminal plans. The company furthermore pledges itself to co-operate with the city in developing at some point or points in the Borough of the Bronx a union station or stations, at which passengers can change from their suburban and through trains to the Subway and to the various elevated roads running to the south. The Mayor thinks that such a union station and transfer system would obviate the necessity for the underground loop station at Forty-second Street; but it seems to us that while a large part of the suburban travel on the New York Central would be transferred at such a union station, there would still be a large proportion of the suburban travelers who would wish to continue directly to Forty-second Street