SCIENTIFIC AMERICAN

ESTABLISHED 1845

MUNN & 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

THE SCIENTIFIC AMERICAN PUBLICATIONS.

Scientific American (Established 1845)	$3.00	a year
Scientific American Supplement (Established 1876)	5.00	"
Scientific American Building Monthly (Established 1885)	2.50	"
Scientific American Export Edition (Established 1878)	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, MAY 13, 1905.

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.

THE INTERNATIONAL RAILWAY CONGRESS.

Fittingly enough, the seventh international railway congress convenes this year at Washington—fittingly because, whatever may be the part played in other countries by the railroad, and far-reaching as its influence has been within their boundaries, it is to the United States we must turn for the more striking evidences of the economic revolution that perfected methods of transportation have wrought. Apart from the mere magnitude of our railway system, we may justly claim that the improvements we have made in permanent way, motive power, and rolling stock have been more marked than those of European roads.

The congress is not to be slightingly regarded as a convention of business men. It is a technical body, whose object it is to promote the engineering progress of railways as well as their economic advancement. Papers of a scientific character are to be read, and the widely-divergent opinions of expert traffic managers, engineers, and car-builders from every country in the world will be heard. In all, four hundred and fifty delegates named by railways of forty-eight countries have crossed the Atlantic and Pacific Oceans to convene at Washington.

Americans will undoubtedly learn much from the discussions that must inevitably arise in such a gathering. The problems faced and solved by the railway men of this country (problems that were well presented in the address of Mr. Stuyvesant Fish before the Congress) are vastly different from those that have confronted Europeans. Here we have been engaged chiefly in providing means of transportation where none previously existed, in threading fertile but unpeopled expanses remote from the sea. In Europe, on the other hand, the railway has been employed, not for the purpose of opening uninhabited regions, but for the more easily attained end of supplementing existing highways and waterways, and of providing a more rapid and efficient means of communication between crowded cities. Perhaps the difference will be more apparent when it is said that European cities were founded centuries ago; that in 1830 the greater part of this country (nearly the entire portion lying westward of the Alleghany Mountains) was an untraveled wilderness; and that seventy years ago there was but one city in America with a population of 100,000, and only twenty-two others with a population of 10,000. On the Atlantic seaboard conditions are fast approaching those of the more densely inhabited European countries. We have now thirty-nine cities of 100,000 inhabitants and over, among them three with more than a million each, besides some four hundred towns with populations of 10,000 to 100,000. Because of this tremendous upbuilding of our communities, we must learn the methods which the European railway builder and manager have found most adequate in dealing with the pressing problem of a rapidly-increasing population. Although the capitalization of our railways is now $63,186 per mile (still far below that of $277,475 of the railways of Great Britain) an increase must certainly be expected, necessitated largely by the laying of additional tracks and the elevation of roads in densely-packed towns. In coping with difficulties of this kind, we must look to Europe for help. And to Europe likewise must we turn for enlightenment on the problem of passenger and freight traffic. Despite the fact that in the middle and western States from seventy to eighty per cent of the revenues have been earned by the carriage of freight, the Atlantic States, according to Mr. Fish, have actually reached the British condition in which passenger preponderates over freight traffic. Only fifty-four per cent of the receipts in the States in question are derived from the carriage of freight.

The foreign delegates will learn how it is that American railways have created both traffic and production, and how the paradoxical situation has arisen which renders it possible for American roads, despite the great cost of labor, to carry freight more cheaply than any railways in the world. Our methods, startlingly different from those followed across the sea, and the products of American inventive genius, untrammeled by years of custom, will no doubt prove revelations to our foreign visitors. If the reports to be submitted at this session, and the discussion of them, are to be marked by the thoroughness of treatment which we have reason to expect of a scientific body, both Americans and Europeans will undoubtedly find that this seventh convocation has been productive of more enlightenment than any of its predecessors.

THE ECONOMICS OF THE MOVING PLATFORM.

We have discussed elsewhere in this issue the motives which have led the Rapid Transit Commission to reserve Thirty-fourth Street for a subway operated with electrical trains, and suggest to the promoters of the moving platform the use of some other less important crosstown thoroughfare. This action of the commission is not to be taken as a reflection upon the practical or commercial value of the moving platform proposition; and, indeed, a study of the mechanical features, as revealed in the engraving which we publish in this issue, and the fact that this system has the indorsement and backing of some of the best-known railroad and electrical experts in this country, afford a strong presumption that wherever the platform is installed it will be so successful as to become an important element in the future transportation facilities of large and crowded cities.

The most striking testimony in favor of the moving platform is that given last November by Mr. Stillwell, the electrical expert of the Interurban Railroad Company, in which he showed the great economic advantage possessed by the moving platform over the electric-car system for city transportation. As the author of the following figures is the electrical engineer for both systems his calculations may be taken as absolutely correct and free from all partiality. It seems then, in the first place, that the moving platform has a great advantage in respect of the dead weight carried per passenger; for whereas in the local Subway service 1,241 pounds of dead weight must be carried for each seat provided, and in the Manhattan six-car local service 790 pounds per seat, in the case of the moving platform the dead weight will amount to only 437 pounds per seat, or one-third of what it is in the case of the Subway. There is, moreover, a large saving of energy resulting from the fact that the moving platform does not stop at stations. In the local service of the Subway over two-thirds of the energy supplied to the cars is dissipated in braking. In other words, if the cars moved at uniform speed and never stopped at stations, it would require only one-third of the power plant to keep the whole system in operation. A comparison of the power required to move the trains and to move the platform shows that the Manhattan Elevated cars require at the power house 30 kilowatts per car, and Subway cars require, at equal speed, about 50 kilowatts per car. In the case of the Subway the energy required is practically 1 kilowatt per seated passenger; that is to say, 10 kilowatts at the power house are required to transport ten seated passengers in the Subway. Estimating the rolling friction of the platform at about 6 pounds per ton, Mr. Stillwell estimates that 10 kilowatts, instead of moving, as in the case of the Subway, ten passengers, would move 260 passengers if they were seated on the moving platform. This great difference of 1 to 26 is due to the small dead load, to the absence of stopping, and to the fact that the rolling friction per ton is very much less.

It has been charged against the moving platform that the speed, 9 miles per hour, is low; but it was shown by Mr. Stillwell and indorsed by Mr. Stuyvesant Fish, that, because of the frequent stops, say on the local elevated or Subway trains, and of the great delay at stations in rush hours due to insufficient means of ingress and egress to and from the cars, the higher speed of the elevated and Subway trains between stops is brought down, if the stops be included, to an average speed of 9.67 miles per hour, which is only a little over one-half mile per hour greater than that of the platform which maintains its 9 miles an hour continuously.

Finally, the capacity of the moving platform is vastly greater than even that of a four-track system when running under its shortest headway. The capacity of the four-track section of the New York Subway, using eight-car express trains at intervals of 2 minutes, and five-car local trains at intervals of 1 minute, is 28,080 seated passengers an hour in one direction; whereas the capacity of the moving platform in one direction is 47,520 seated passengers per hour, an increase of nearly seventy per cent. In the presence of such facts as these, facts of whose reliability, considering the source from which they come, there can be no doubt whatever, it is safe to predict that the moving platform will become an important element in the future rapid transit system of this and other large cities; and it is to be hoped that if the decision of the Rapid Transit Commission against the use of Thirty-fourth Street is final, the sponsors of the moving platform will make use of the opportunity presented for the use of Twenty-third Street or some other important crosstown thoroughfare.

THE STRENGTH OF TIMBER TREATED WITH PRESERVATIVES.

With the increasing use of timber, preserved in one way or another against decay and fire, it is important to determine the effect which the preserving process has upon the strength of the preserved timber. Many engineers believe that creosoted timber is more brittle and less capable of withstanding strains than the same timber before being treated with creosote. This is particularly true with bridge timbers and piling.

Actual tests are necessary to determine what relationship exists between the preservative process and the strength of the timber. Most of the tests hitherto made with preserved timber were made by comparing results of tests on treated sticks with results on untreated sticks. In many instances these turned out in favor of the untreated timber. The reason why such tests are unfair to the preservative is that in the process of preservation two factors enter: (1) The actual process of impregnation with a preserving substance, and (2) the preliminary processes of steam seasoning, in the majority of treating plants in the United States. A piece of timber subsequently treated with creosote may be steamed to such an extent that the timber becomes exceedingly brittle. This, obviously, will be the fault of the steaming and not of the creosote.

Timber preservation divides itself broadly into three stages: First, the preliminary preparation; second, the actual preservative process; and, third, the treatment of timber following preservation. The final strength of the timber may be influenced materially by each of the stages.

The Bureau of Forestry erected an extensive plant on the grounds of the St. Louis Exposition for carrying on a series of investigations of the methods for preserving timber, and of the influence various preservative processes have upon the strength of the timber. These investigations have been organized and outlined by Drs. Von Schrenk and Hatt of the Bureau of Forestry.

This general plan was pursued during the last few months at the timber treating and testing station at St. Louis in accordance with the following outline:

(1) To determine the effect of preliminary processes, such as steaming, on the mechanical properties of the timber.

(2) To determine the effect of preservatives on the strength of timber, eliminating the effect of the preliminary processes.

In order to determine the effect of these factors, the programme was divided into two parts—part 1, the effect of the preliminary process, and part 2, the effect of preservatives.

The effects of the preliminary process were determined only on loblolly pine. Both green and seasoned timber was used in determining the effect of the preservatives. The preservative fluids investigated included only creosote and zinc chlorid.

In making comparative strength tests of treated and untreated timbers, it is necessary to eliminate as far as possible the variations due to the great differences in quality of individual pieces of wood. This was accomplished in this case by using 11-foot timbers cut at the same time from one forest site. In testing the influence of preliminary processes of seasoning, a 3-foot section was cut from one end of each timber and sawed up into test pieces, which furnished a basis of comparison between (1) the results of tests on these "control" pieces, and (2) the results on test pieces taken from the remaining 8-foot section after the latter had been subjected to the various preliminary seasoning processes in the treating cylinder.

In testing the effect of preservatives themselves the entire 11-foot timber was subjected to the preliminary seasoning processes, after which a 3-foot section was cut from the end of each timber. The 3-foot section thus having been subjected to the preliminary seasoning processes formed a basis of comparison with the remaining 8-foot section, which was treated with the preservatives. In this way the separate effects of the preliminary processes and the effects of the preservatives could be isolated and determined.

Because of an apprehension that defects of brittleness of treated timbers might not be evidenced by the ordinary tests under slowly applied loads, provision was made for both static tests and impact tests. The test pieces were subjected to crossbending strain, compression along the grain under both static and impact conditions, and under shearing parallel to the grain and compression at right angles to the grain under static conditions. The data taken include the moisture conditions, specific gravity, and rate of growth. During the treating operations, records were kept of the temperature to which the timbers were subjected at all stages, the amount of water lost or gained, and of the