

## 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 11s. 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 1873) ..... 3.00  
 The combined subscription rates and rates to foreign countries will be furnished upon application.  
 Remit by postal or express money order, or by bank draft or check.  
 MUNN & CO., 361 Broadway, New York.

NEW YORK, SATURDAY, MARCH 15, 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.

## THE NEW CUNARD LINERS.

If there is one company more than another that is identified with the history of the transatlantic passage it is the Cunard Company, and its historical interest is enhanced by the fact that through all its long service it can boast of having never lost a passenger. At the present writing, however, one of its most famous vessels, the "Etruria," is being towed into port, suffering from that most common of all steamship ailments, a broken propeller shaft. This mishap, by the way, serves merely to emphasize the wonderfully successful record of this ship and her sister ship the "Umbria." Although they were put in service as long ago as 1888, they are now good for over 19 knots an hour. They are the largest single-screw vessels in the world, and represented, at the date of their launch, the most advanced ideas in marine engine construction. The "Etruria" was the first ship to make the transatlantic passage at an average speed of 20 knots an hour.

Equally famous as record-breakers were the next pair of Cunarders, the "Campania" and "Lucania," the latter of which was the first liner to pass the 22-knot mark for the whole passage. These two vessels, it may be truly said, were the progenitors of the high-speed twin-screw vessels of the last decade of the nineteenth century. With their great length of over 600 feet, their large engine power of over 30,000 horse power, and their use of tandem, multi-cylinder engines, they introduced the latest era in the growth of the high-speed liner, of which such vessels as the "Deutschland," "Oceanic," and "Kronprinz" are the latest developments. The Cunard Company have seemed content to rest on the laurels gained for them by these vessels, and for nearly a decade they have seen the German companies forge to the front in the production of ocean "fliers." For the past two years, however, they have been considering the question of putting two new high-speed vessels on the Queenstown route, and we are able to state authoritatively that it has now been determined to give these ships such speed-lines and engine power that they will be considerably faster than any ocean liner building or planned at the present time. The probabilities are that the contract speed will not be less than 25 knots an hour, and in view of the fact that to secure this speed in ships of the size would require not less than 47,000 horse power, it is natural that the company should seriously consider the adoption of the steam turbine, with the object of reducing the weight and bulk of the necessary installation of boilers and engines. Although the use of the turbine has not been definitely determined upon, there is a strong movement among the directors in favor of its adoption.

We commented last week upon the fact that in the equipment of one of the underground London railways, the central power station was to be equipped with steam turbines, each of 10,000 maximum indicated horse power. There is every reason to believe that the performance of these turbines will be eminently satisfactory. It is certain that the variations of load to which turbines of the same size would be subjected on board an Atlantic liner would not be more severe than those experienced in the operation of an electric road, for the turbine is peculiarly susceptible to its governor, and with the great depth of submersion of the propellers of ships of this size the liability to racing in heavy weather, with its resulting variations of load and stress, would be largely avoided. An equipment of four 12,000 horse power turbines on four shafts would give the required horse power for the speed, and we venture to say that the perfect absence of engine vibration—propeller vibration will always be present—would render these ships, should they be so equipped, the most popular high-speed liners in the world.

## THE PARK AVENUE HOTEL FIRE.

The Park Avenue Hotel fire, in which a score of persons lost their lives, does not prove, as the daily press would have us believe, that fireproofing is a failure. On the contrary, there is every reason to

believe that it was the fireproof construction of the hotel, limited though it was in degree, that prevented a positive holocaust, in comparison with which the present loss of life would be insignificant. Strictly speaking, the building should be called semi-fireproof. It was built over twenty years ago, and probably included all the latest ideas on fireproof construction. The main walls, which are of brick, are substantial, and have a cast iron sheathing on the outside. The floors consist of I-beams with brick arches turned in between. There are the usual partition walls, and, of course, there is an abundance of inflammable wood-work throughout the building.

The evidence thus far come to light tends to show that the fire started at the bottom of an elevator shaft and spread from thence to the corridors on the various floors; and it is to the existence of a considerable amount of woodwork in the elevator shaft, in the windows opening from the shaft to the courtyard, and in the doors leading to the corridors, that the exceedingly rapid spread of the fire is due. Had this wood-work been fireproofed, or, better yet, had the window sashes and doors and all fittings throughout the shaft been constructed of metal, it is probable the fire would have been confined to the shaft, and that not a single life would have been lost. At the same time, the evidence of the Chief of the Fire Department shows that the hotel was sadly deficient in fire-fighting apparatus. The firemen complained of being unable to find stand-pipes or fire hose, and there appears to have been but very inadequate provision of fire alarms for meeting such an emergency as occurred on the night of the disaster.

Undoubtedly the loss of life was largely due to the ignorance on the part of the transient guests of the fact that there were rear staircases by which they could have escaped from the hotel. As it was, they rushed for the central staircase adjoining the elevator, and in doing so ran into the fire itself; a fact which emphasizes the necessity for providing more conspicuous signs than those that are ordinarily found in hotels to-day, directing guests to fire escapes or to alternate stairways and elevators. We venture to say that in scores of hotels, where there are two or more separate staircases or elevators, the majority of the guests are aware simply of the existence of the one elevator which is most adjacent to their own rooms. In this connection we would most earnestly impress the fact that in large hotels and office buildings it would conduce greatly to the safety of the guests if, instead of concentrating the elevators in one locality, they were placed at two or more widely separated positions in the building.

## WIRELESS TELEGRAPHY IN NAVAL WARFARE.

The feat accomplished by Marconi on his recent trip to this country, when he received distinct tape-written messages from Poldhu, Cornwall, until he was over 1,500 miles from that point, must have served to silence all doubts as to the commercial practicability of wireless telegraphy. Nowhere is the success of this system being watched more keenly than by the navies of the world, for it is well understood that, in proportion as the range of wireless telegraphy is extended, will the operations of future naval campaigns be greatly modified. Already it is possible to communicate across 1,500 miles of water, and although it is true that the sending station of Poldhu is equipped with a specially powerful plant, we presume there are no mechanical or structural difficulties in the way of equipping naval scouting vessels with sending apparatus of equal power. We notice that the British government has authorized the construction of four new vessels of the naval scout type which are to have a speed of 25 knots an hour and are to be equipped with very lofty masts for wireless telegraphy purposes. It is probable that this type of ship, which was originated by Russia with the ships of the "Novik" class, is destined to enjoy a popularity similar to that of the torpedo boat and the destroyer. With fleets of these craft patrolling the sailing lines between the most important strategic points, a nation will be able to keep in close touch with all important movements of the enemy, and naval warfare will be played very much less in the dark than it has been. If, for instance, during our late war, wireless communication over 1,500 miles of water had been possible, the naval operations would have been greatly simplified and much confusion and anxiety avoided. It will be remembered that in our blind groping to get in touch with Cervera's fleet, and in the attempt to conduct the war by the triangular Washington-Sampson-Schley method of communication, the transmission of news was ultimately dependent upon the speed and good luck, in finding either commander, of the various converted yachts and cruisers of comparatively low sea speed that were used to carry dispatches. It is certain that many of the risks of the war that were run and much of the confusion and controversy that resulted were due to the difficulty of obtaining quick communication from shore to ship and between the ships themselves.

With a 1,500-mile-radius Marconi system installed, however, how completely the story of the war might have been changed. Let us suppose that stations similar to that at Poldhu had been erected at Key West and at Washington, and that all the important vessels engaged in the campaign had carried sending and receiving apparatus to match it. Let the reader take a map and strike, with a 1,500-mile radius, circles from Key West and Washington, and he will find that from both stations it would have been possible to communicate directly or indirectly with every vessel engaged in the Santiago campaign throughout the whole of the operations of the war. Instead of our fast ocean scouts "Yale," "Harvard," "St. Paul" and "St. Louis" having to remain within reasonably close touch of a telegraphic station, these vessels, had they been so minded, could have cruised far across the Atlantic Ocean; or they could have formed complete chains of communication with Washington by stationing one at the Canary Islands and another at Cadiz to give notice of the start of the Spanish fleet or fleets, and stationing the other two in mid-ocean to pick up the news and transmit it to Admiral Sampson, or direct to the Key West or Washington station. The "Oregon" would have been in touch with Key West nearly a week before she completed her voyage around Cape Horn, while, in the Philippines, Dewey, by leaving one of his smaller non-fighting craft at Hong Kong, could have cut the cable, as he did, and yet have communicated hourly with Hong Kong and so with the Navy Department at Washington.

Returning to the Santiago campaign, we can see that all the miserable imbroglio known as the Sampson-Schley controversy never have occurred, for Schley would have been relieved of all doubt as to the proper course to take in the matter of blockading the Spanish ports, or of making retrograde movements, for he would have been in touch both with Sampson and the Navy Department at Washington, either directly, or through the intermediary of some United States vessel, carrying the Marconi equipment.

In view of the far-reaching effects which the demonstrated success of wireless telegraphy is bound to have on naval warfare we are glad to notice that Rear-Admiral Bradford, Chief of the Bureau of Equipment, is said to have ordered wireless telegraphy equipments of various types, in which are included the Marconi and the Slaby-Arco, which are to be thoroughly tested before it is decided what system will be adopted by the United States navy.

## A PLEDGE TO IMPROVE THE PARK AVENUE TUNNEL.

The investigation by the Grand Jury of the recent accident in the Park Avenue tunnel of the New York Central Railroad Company, in which seventeen people lost their lives, has resulted in the indictment of the engineer of the New York Central train for manslaughter, and the dismissal of the complaint against the railroad company. The complaint stated that it was the duty of the company to use all reasonable means to prevent trains from running under such close headway as to be in danger of collision, and to equip their line with an adequate system of signals, but that the company omitted to perform its duty as thus outlined. The testimony before the Grand Jury occupied three days and a half in presentation, and a day and a half was spent in discussing the same. District Attorney Jerome has stated that the law in the case was carefully examined by himself and his assistants, and that the Grand Jury, which he describes as being "exceptionally intelligent," fully understood everything connected with the case. Furthermore, Mr. Jerome, who certainly cannot be accused of partiality to the railroad company's side of the case, was of the opinion that further proceedings against the railroad company would be inexpedient and futile.

Unquestionably, the feature in the evidence which was considered to absolve the railroad company from the charge of culpable negligence was the practically unanimous testimony of the experts that the signaling system employed in the tunnel was the very best in existence. Speaking in a general way, and considering this system of signals in respect of its efficiency when used under normal conditions, we quite agree with the experts that it is the best in existence. But inasmuch as the system depends for its efficiency upon the visibility of the signals, and the evidence clearly proved that, under conditions which are perpetually occurring in the tunnel, the signals are not visible, we are inclined to think this "best system in the world" for use in the open and under normal conditions, ceases to be so under the exceedingly abnormal conditions that exist in the Park Avenue Tunnel. We venture to say that there is no stretch of track in all the 400,000 miles of railroad in the world where the conditions are similar to, or even approach, those in this tunnel. "What is one man's meat is another man's poison." The best signals in the world for the stretch of viaduct, for instance, by which the New York Central tracks approach the tunnel, from the north, may become, as the event has surely proved, an exceedingly unreliable and treacherous system if it is extended