

# 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

## THE SCIENTIFIC AMERICAN PUBLICATIONS.

Scientific American (Established 1845).....\$3.00 a year  
 Scientific American Supplement (Established 1876)..... 5.00  
 Scientific American Building Edition (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.  
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MUNN &amp; CO., 361 Broadway, corner Franklin Street, New York.

NEW YORK, SATURDAY, OCTOBER 14, 1899.

## MARCONI TELEGRAPHY.

Through the enterprise of The New York Herald, the public has been made acquainted in a very practical way with the great advantages which result from the use of what is now popularly known as the "Marconi system of wireless telegraphy." The world-wide interest which is being taken in the present international yacht races renders the instant transmission of the progress of the race a matter of actual importance, and the saving of a few hours' time, which is rendered possible by wireless telegraphy, led to the bringing of Mr. Marconi to this country in order that he might report the races from a steamer which accompanies the yachts over the course.

On the day of the first race the large ocean-going steamer "Ponce" was equipped with a slender mast which extended some 50 feet vertically above the foremast of the vessel. A similar mast was carried by the Mackay-Bennett cable steamer, which was anchored at the starting point, off Sandy Hook, and had temporary connection with the submarine cable at that point. The Marconi apparatus was installed in the chart room on each vessel, and the progress of the yachts was telegraphed at intervals of a quarter of an hour from one vessel to the other. From the steamer at Sandy Hook the messages were sent to New York, whence they were distributed throughout the world. The experiment proved to be perfectly successful, and the reports contained in The Evening Telegram appeared from two to three hours sooner than those transmitted by the ordinary methods.

Marconi comes to this country fresh from the triumphs which he has scored with his system in the recent maneuvers of the British navy, where messages were flashed from ship to ship over a distance of 80 miles. It was inevitable that the great success which is attending the Marconi system should have aroused the interest, and in some cases excited the jealousy, of other investigators in the field of wireless telegraphy. Marconi himself, we have no doubt, would be the first to acknowledge that there are others who have done conscientious work in this line of investigation, and he would be perfectly willing to give full credit where it is due. The existence of the Hertzian waves was known long before this young Anglo-Italian harnessed them so successfully to the uses of modern life, and others, both before and after him, have attempted unsuccessfully to do what he has done.

We regret to note that his arrival in America has unduly excited certain holders of patents on wireless telegraphy, who believe that Marconi is receiving more credit than is strictly his due, and claim that the credit is not his, but theirs. This has been the history of all great epoch-marking inventions, and the recent extraordinary attempts to prove that the Bessemer steel process was misnamed, and that a certain Kelly had actually done the work and should receive the credit, will be fresh in the minds of our readers. We note in this connection that a certain section of the press is responsible for the statement that Professor Dolbear, of Tufts College, is "the discoverer of wireless telegraphy," and that he is so far resentful of Marconi's invasion of his domain that "a conference of lawyers has been held," and instructions have been given to "serve notice that he (Marconi) would be restrained from using his system of wireless telegraphy in the United States."

Whatever may be the merits of this controversy, we are satisfied that it would be as easy to sweep back the tide with a broom as to prevent the system of telegraphy which has just done such good work off New York Harbor and with the English fleet from becoming forever identified with the name of the man who first brought wireless telegraphy to a practical and useful consummation.

## "COLUMBIA" AND "SHAMROCK" IN DRY DOCK.

Next to the races themselves there is no event connected with a contest for the "America" cup which equals in public interest the docking of the yachts and the consequent disclosure of their underwater form; for it is in the model of the modern yacht and not in

her sail plan that the genius of the designer of to-day is most apt to reveal itself.

The secrecy which surrounded the construction of the competing yachts had awakened more than usual curiosity as to the form and construction of the two boats. It was naturally believed that the extraordinary precautions which were taken to prevent the public from getting even a hint as to the beam, draught, or lines of the contestants was due to some marked departure from existing practice, if not from established theories. "Columbia" was launched at night; "Shamrock" in petticoats; and the Sphinx was not more silent on the questions which were in everyone's mind than the gentlemen who were responsible for the "America" cup champions of the year 1899.

It must be confessed that the docking of the yachts has furnished a great surprise; for where the public was looking for novelties it found in the case of both challenger and defender nothing more nor less than a typical, up-to-date yacht. The characteristics of the type, as represented in a "ninety-footer," are a beam of about twenty-four feet and a draught of twenty feet; some eighty to ninety tons of lead on the keel; a displacement of from one hundred and forty to one hundred and fifty tons; and a sail area of about thirteen thousand square feet. The materials of construction will include nickel steel for the framing, plating of some non-corrodible bronze, and hollow steel spars of great strength and lightness.

Now if we take the "Columbia" and the "Shamrock" as examples, we find that they conform with wonderful closeness to the above specification—at least as far as dimensions and materials are concerned. In the matter of model, both above and below the water line, there are, it must be admitted, very marked differences between the two boats; but in no sense can either be called a surprise. They possess all the characteristics which distinguish a Herreshoff from a Fife design, and certainly they present no startling novelties, hitherto unknown or untried by yacht designers. "Columbia" is an improved "Defender," "Shamrock" an enlarged and improved "Isolde."

Compared with the champion of 1895 "Columbia" is in every way a more beautiful yacht. The three views which we present were taken when she was in the large No. 3 dry dock at the Brooklyn navy yard, and they show what exquisite beauty can be given to the underwater form even of a deep finkeel vessel of this extreme type. The variations from "Defender" are all in the direction of securing a finer form, one that can be driven through the water with less expenditure of power. While the beam is wider and the lead placed lower, the overhangs and the waterline length are considerably larger and the entrance and delivery are finer than in the older boat. The hull proper is deeper, and the whole model is a further departure even than was that of "Defender" from the old skimming-dish type of hull. The construction, moreover, is more wholesome than that of "Defender"; for the treacherous aluminum alloy in frames, deck beams, and topsides has given place to more reliable steel and bronze, with the result that our '99 champion will be prepared to cross the ocean and try her paces in the regattas of the Mediterranean and the Clyde.

In "Shamrock" the English have sent over their first out-and-out racing machine. She is the lightest yacht of her size ever constructed, not even excepting "Defender"; for in her aluminum deck alone she has saved about 5,000 pounds of weight as compared with that yacht. Perhaps the most striking features of the boat are her unusually lofty topsides (her freeboard is over 5 feet as against 3½ feet in "Columbia") and her deep draught of 21½ feet. Her midship section shows a considerable flare above the waterline, and this, combined with her wide beam, high freeboard, and deep lead, gives her great sail-carrying power, especially in a strong wind. The boat has rather a hard bilge and a flat floor, which rounds into the fin proper with a short hard curve. When afloat she looks to be much bigger than she is, most of the boat being above the waterline, and as a glance at the midship sections of the two vessels will show, she approaches more nearly to the true finkeel type than does "Columbia." The sheer-plan shows that the "Shamrock's" keel is much the longer (at least 8 or 9 feet); hence the center of gravity of the lead is lower, and this coupled with the fact that her draught is deeper by 1½ feet makes it certain that the center of gravity of the lead is at least 3 feet deeper below the waterline in the English boat. Other things being equal, this means less lead for the same stability. At the same time the longer keel involves the addition of about 220 square feet of wetted surface, and a slower boat in light winds. In heavy winds, and indeed in any wind, the longer keel should make "Shamrock" a better boat in climbing to windward when close-hauled.

At the present writing there have been two unsuccessful attempts to sail the first race of the series. The winds were too light and fickle to afford any reliable test of the yachts; for although "Columbia" was the leading boat during the greater part of the contests, on both occasions "Shamrock" was slightly in the lead when the race was called off. In spite of the fact, how-

ever, that the challenger showed unexpected light-weather qualities, it seemed to us that the performance of the two yachts indicated the "Columbia" to be the better all-round boat under the prevailing conditions.

## PROPOSED CYCLE PATH ACROSS THE BROOKLYN BRIDGE.

The earnest efforts which are being made by the great body of wheelmen in New York city and Brooklyn to secure a separate cycle path across the bridge for their exclusive use are perfectly reasonable and deserving of the strongest support. The day has gone by when the efforts of wheelmen to secure proper facilities on our thoroughfares can be regarded as an endeavor to secure favors for a small minority at the expense of the general public. The enormous increase in the number of riders in the last few years has been accompanied by a demand for special provisions for their safety and convenience, and in nearly every case they have gained what they sought. Wheels are now carried as baggage free of charge on our railroads, and special protection is afforded in some of our cities by specially-trained squads of policemen.

However, it is not with the legal or ethical side of the question that we are concerned so much as its practical and mechanical aspects. As far as the structure of the Brooklyn Bridge is concerned, there is not the slightest reason why a cycle path should not be built across it. If the path were provided, the additional weight would be so insignificant compared with the total dead and live loads of the structure as to be a practically negligible quantity. Obviously the best location would be above one of the pairs of interior stiffening trusses through which tracks of the bridge trains are laid. Light steel floor beams could be laid across the top chords of the trusses, and these, together with the plank flooring and the light hand rail, would weigh but little per foot and would add practically nothing to the existing strains in the bridge.

It seems that the problem at present, as stated by the bridge engineers, is to provide a suitable terminal at the New York end of the structure, but it is certain that in view of the light nature of the necessary construction and its comparative narrowness, some way out of the difficulty could be found which would neither encroach seriously on the present space, nor present an objectionable appearance judged from the æsthetic point of view.

The opposition of the engineers of the bridge to the addition of any further weights, however small, to the structure is natural, and on general principles commendable. It is their duty to see that the limits of safety are not exceeded nor even too closely approached. At the same time we cannot but remember that the running of the trolley cars across the structure was at first strenuously opposed and pronounced to be neither practicable nor safe. The car tracks, however, have now for a long period been in operation, and have proved to be of inestimable service to the public. The bridge has suffered no harm from the addition, and we believe that as long as the proper headway has been observed, the safety of the structure has been in no degree jeopardized.

## AMATEUR INVESTIGATIONS WITH A TESTING TANK.

In the current issue of the SUPPLEMENT is published the first part of an article which will be of the greatest interest to those of our readers who are interested in the matter of boats and boat sailing. The author of the papers is an amateur yachtsman with more than a quarter of a century of experience, who set out to determine for himself, by practical experiment, many questions which are supposed to be theoretically pretty well established. To determine the best model of hull and the influence of the various elements of beam, draught and general form on speed, the author of the paper constructed a small towing tank equipped with a dynamometer and a set of experimental models, the whole of which, including the tank, could be placed in a fair-sized sitting room. It is true no attempt was made to secure anything like the scientific accuracy of a full-sized shipbuilder's model basin; but the simplicity and cheapness of the apparatus, and the agreement of the results in a general way with those obtained in a full-sized tank, render the experiments of extreme interest and certainly of value.

Any amateur who wishes to test for himself the many vexed questions connected with the designing of a boat can do so at a small expense by following the methods described in the article referred to. The question of the best form of sails will be taken up in the second part of the article, which will be published in the SCIENTIFIC AMERICAN SUPPLEMENT of next week. The writer claims to have been the originator of the theory that a perforated sail would, under certain conditions of wind, do better work than a sail of the ordinary pattern. The principle of perforation was tried in a lengthy series of experiments with sails built on the principle of the Venetian blind or per-