

# 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 1878)..... 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 &amp; CO., 361 Broadway, corner Franklin Street, New York.

NEW YORK, SATURDAY, OCTOBER 27, 1900.

## TO THE ARMOR-PLATE MAKERS.

It is greatly to be regretted that the armor-plate manufacturers, after obtaining from Congress such marked concessions in respect of the price to be paid for armor, should now be obstructing the work of letting contracts by an unseemly scramble to obtain a monopoly of the much-coveted orders. The amount of armor required is 35,000 tons. The bids which were made during August were of such a nature that there was no course open to the Secretary of the Navy but to reject them. The Midvale Steel Company announced that it would not accept a contract for less than 20,000 tons of armor, while the Carnegie and Bethlehem Companies each stated that they would not accept a contract for less than 18,250 tons. To have given a contract for 20,000 tons to the Midvale Company would have left only 15,000 tons to be awarded to two companies which had each refused to take less than 18,250 tons. Even if this had been done, there was a difficulty due to the fact that the Midvale Steel Company asked for twenty-six months to complete its armor plant and commence making deliveries. As the armor for the ships of the "Maine" class will be required at a comparatively early date, the acceptance of the bid of that company was out of the question.

In view of the fact that at its last session Congress had made such liberal concessions in the matter of price, it was naturally expected that after the rejection of the August bids the Carnegie and Bethlehem Companies would have arranged to put in bids for the 35,000 tons required that would have met the necessities of the case. We greatly regret to note, however, that at the last meeting between the representatives of the navy and the manufacturers, no satisfactory arrangement was reached. We should have thought that in view of the strong opposition that has developed in Congress to paying the large prices demanded by the makers, these two companies would have been moved by the dictates of prudence and common sense to show a more conciliatory and reasonable spirit. This journal has always advocated paying a fair price for armor, and has always deprecated the hostility displayed in Congress against the manufacturers; but we are free to confess that unless the Carnegie and Bethlehem Companies are prepared to meet the naval authorities in a more reasonable and less arrogant mood, they will themselves strengthen the opposition of the very party in Congress which has hitherto caused these large armor-plate establishments to stand so many months in complete or comparative idleness.

## AN AMERICA CUP CONTEST IN 1901.

With a simplicity and dispatch which are delightfully refreshing after some of the long-drawn-out correspondence of former years, another challenge has been sent and accepted for the famous America cup. According to the wording of the challenge, the owner of the new vessel will be Sir Thomas J. Lipton; her name will be "Shamrock II."; she will measure 89 feet 5 inches on the water line, and she will be of cutter rig. It is more than probable that the new vessel will be designed by Mr. Watson, from whose hand came the "Thistle" and the two "Valkyries." For the defense we have the "Columbia," whose victory over "Shamrock" was by such liberal margins as to render her a decided competitor for the honor of defending the cup in the forthcoming match. To make certainty doubly sure, however, it is probable that Mr. Herreshoff will be instructed to go ahead and beat his own famous production, a task which he is sure to accomplish. The interest of the forthcoming struggle will center very largely around Mr. Watson, whose success with the German Emperor's "Meteor," and with the new yawl "Sybarita," constructed for this season's racing in English waters, renders it probable that as he did so well with yachts of the composite type, constructed of steel and wood, he will turn out an extremely fast cutter if given the same advantages

in respect of materials which favored Mr. Fife, the designer of "Shamrock I." Construction in bronze or aluminium, and the substitution of hollow for wooden spars, would secure a saving of from eight to ten tons over a vessel of the "Meteor's" construction. Mr. Watson has never had an opportunity to try his hand in the new materials, and with the experience obtained in "Shamrock I." to guide him, he should be able to build a worthy competitor for Mr. Herreshoff's new defender. As Sir Thomas has expressed his intention of using the first "Shamrock" as a trial boat for the second craft of that name, the new challenger will enter the races of 1901 in the very best possible condition as to crews, sails and spars.

Recent experience in the handling of "out and out" racing machines suggests that in lightness of construction we have exceeded the margin of safety; as witness the case of "Shamrock," whose hollow spars buckled so badly in a breeze of any strength that the yacht was unable to get the full benefit of her magnificent suit of canvas, and the failure of the four Herreshoff 70-foot cutters of this season, whose hulls were so weak that their bows were pulled out of shape whenever a breeze of any strength brought a heavy strain upon the stays. It may be taken for granted that in the matter of lightness the competing yachts will start on even terms, and the race will be won on form, sail-plan, and seamanship.

## ZEPPELIN'S AIRSHIP ON TRIAL.

The second trial of Count Zeppelin's colossal airship is described in press reports from Friedrichshafen as being a notable success. After rising to a height of about two thousand feet, the vessel remained poised at that level for three-quarters of an hour. It then made a series of tacks, and went through certain turning maneuvers, afterward traveling with the wind in what is described as "a generally circular direction" for about six miles, the velocity of the wind at this time being about eight miles an hour. It is said that later, in a freshening breeze, the airship turned and "made headway" against the wind. Eventually the vessel descended with "great ease and steadiness to the lake," and was towed to its shelter. The stability and steering powers of the airship are described as being excellent.

If the above reports are correct, we still know as little about the actual practical value of Count Zeppelin's machine as we did before. It has been proved merely that an airship of this kind can ascend, maintain its equilibrium, and be navigated in any desired direction, provided the wind does not much exceed the strength of a gentle breeze. It has yet to be shown that in stronger winds, say of from twenty to fifty miles an hour, this airship can perform the same evolutions. If it should show that it is able to maintain a speed of, say, only twenty miles an hour against a strong wind, aerial navigation by the balloon type of airship will have made an enormous stride in these closing days of the century. Enough has been accomplished to render the further trials of Count Zeppelin's costly and carefully thought out design a matter of world-wide interest. We publish in the current SUPPLEMENT a series of photographic views, which were taken when the airship was being put through the previous series of evolutions, which, it will be remembered, were abruptly terminated by the breakdown of part of the controlling mechanism.

## THE NEW LINER "LA LORRAINE."

"La Lorraine" and her twin sister, "La Savoie," constitute the two latest and fastest steamers to be built for the Compagnie Générale Transatlantique; and the former was thrown open, for the first time, for general inspection on her recent trip to the port of New York. These two vessels were constructed under a mail contract with the French government, by which they receive a liberal subsidy if the vessels fulfill certain requirements as to construction and speed. Unlike the competing American, English and German companies, the French line are restricted in the matter of size of their ships by the limited docking facilities at the port of Havre, and in "La Lorraine" we see the largest vessel that can be accommodated under existing conditions. In these days of displacements which run up as high as 28,500 tons, "La Lorraine" with a displacement of only 15,300 tons seems to be a relatively small vessel, although her trial speed of 22.63 knots places her well up in the front rank of our fast modern vessels. "La Lorraine" is 580 feet long, 60 feet in beam, and has a molded depth of 39 feet 6 inches. She is driven by two sets of triple-expansion engines, each engine having four cylinders, placed side by side, and steam at 163 pounds pressure is supplied by sixteen cylindrical boilers.

On the trial trip, made July 24 of this year, with 89.5 revolutions of the engines per minute, a total of 22,118 horse power was developed, giving a maximum speed, as mentioned, of 22.63 knots per hour. The vessel is constructed with six decks and there are seventeen bulkheads—one longitudinal and sixteen transverse. A

broadside view of "La Lorraine" shows her to be a handsome vessel, with a graceful sheer and a decided flare forward in the bows, which should give her good lifting power in a head sea. She is provided with bilge keels, and in her recent stormy passage the same marked absence of rolling was noticed which characterizes all the later ships that have been similarly fitted. The vessel is almost entirely given up to passengers, and the bulk of the accommodation is reserved for the first-class, of which 446 are carried. There is also accommodation for 116 second-class and 430 third-class passengers. The accommodation and furnishing of the vessel are fully up to the high level which has been reached in the transatlantic service. The drawing-room in particular is an exceedingly handsome apartment, measuring 36 by 59 feet. The decoration is characterized by a general toning of gray picked out with gold, and this is easily the most handsome room on the ship and one of the most pleasing that we have ever seen on a merchant ship of this class. According to literature furnished by the company, it seems that although she attained over 22 knots on her trial trip, the vessel is to be driven at an average sea speed of 20 knots an hour.

## THE LOCAL FORECASTER ON THE GALVESTON HURRICANE.

The special report by I. M. Cline, the Local Forecaster of the Weather Bureau at Galveston, verifies in the main the press reports of the recent disastrous hurricane. It seems that the usual signs which herald the approach of hurricanes were wanting in this case. The "brickdust sky," which has been distinctly observed in other storms that have occurred in that section, although it was carefully watched for, failed to appear even in the slightest degree. On the fatal 8th of September, the wind did not attain a full storm velocity until about 1 P. M., after which it increased steadily until it reached a hurricane velocity at about 5 P. M.; the greatest velocity recorded for five minutes occurred at 6:15 P. M., when the wind reached 84 miles an hour, while for a short time a maximum velocity of 100 miles per hour was recorded before the anemometer blew away. It is estimated that prior to 8 P. M. the wind reached a maximum velocity of 120 miles per hour.

The barometer commenced falling during the afternoon of the 6th, and fell steadily, but slowly, up to noon on the 8th, when it stood at 29.42 inches. It then fell rapidly from noon until 8:30 P. M., when it registered 28.48 inches, a fall of about an inch in 8½ hours. On account of the rapid fall in pressure, readings were carefully taken on the mercurial barometer in order to serve as a check on the barograph, and these readings confirmed the extraordinarily low pressures recorded, and indicate the great intensity of the hurricane. Observer J. D. Blagden is mentioned as having looked after the instruments during the hurricane in a heroic manner, keeping the wires of his registering apparatus intact as long as it was possible for him to reach the roof.

Soon after 3 P. M. on the afternoon of the 8th, Forecaster Cline went from his office to his home, and at that hour found the water around his residence waist deep. At 6:30 P. M. Observer J. L. Cline went across from the office and found the water at the Forecaster's residence neck deep. An hour later there was a sudden rise of about 4 feet in as many seconds. This is estimated in the report to have made a tide of 15.2 feet. As the tide rose during the next hour, between 7:30 and 8:30, nearly 5 feet additional, the total tide in that particular part of Galveston must have been about 20 feet. "These observations," says Mr. Cline, "were carefully taken and represent to within a few tenths of the foot the true conditions." By 8 P. M. a number of houses which had drifted and lodged against the house, assisted by the force of the waves, overthrew the building, and thirty-two persons out of the fifty who had taken refuge in it on account of its strength, were hurled into eternity. Mrs. Cline was lost, and Mr. Cline and his three children were only saved after floating on the debris of the house for three hours. By 11:30 P. M., when the survivors landed, the water had fallen 4 feet. It continued to fall steadily, and by the following morning the Gulf was nearly normal.

If it were not authoritatively so stated in an official report, one would find it difficult to believe that the ocean could have risen, and continued to flow for several hours, from 10 to 15 feet above the level of the city streets. At the same time, the record of destruction for that fatal night calls for some such overwhelming agency; for, according to the estimate of the insurance inspector for Galveston, there were 3,636 houses destroyed, and the latest estimate places the loss of life at over 5,000 souls.

Although the report before us is merely an official record of the work of the station during that awful day and night, reading between the lines it can be seen that the official staff stood at the post of duty with a courage and heroism which could scarcely be excelled. The full text of the report will be found in the current issue of the SUPPLEMENT.