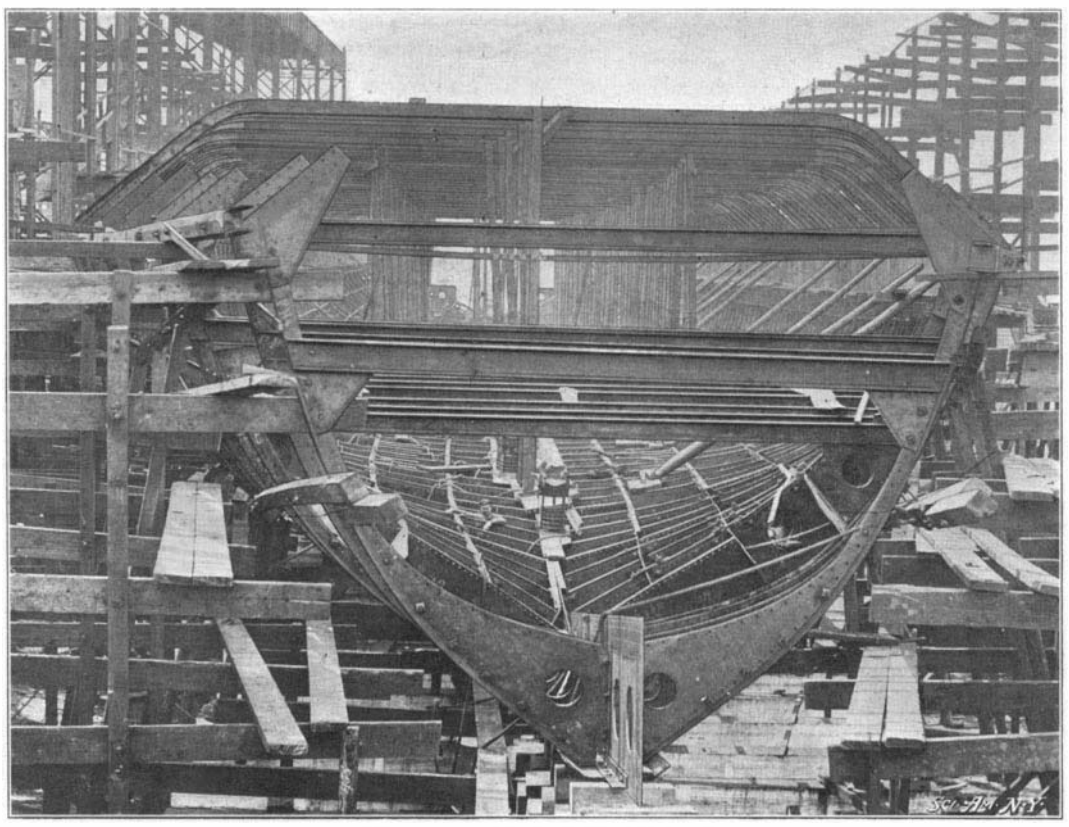
RAPID CONSTRUCTION OF THE BATTLESHIP "LOUISIANA."

When the last Congress passed a law recognizing the principle that part of the warships of the United States navy should be constructed at the government yards, the SCIENTIFIC AMERICAN was doubly pleased with the result; in the first place because we believed that the measure would prove to be of the very greatest value to the interests of the navy at large; and in the second, because it was a recognition by Congress of a principle for which this journal, for many years past, had earnestly pleaded. In advocating this measure we took the ground that a great deal of the delay in the construction of warships was due to the fact that there was no competition to act as a spur to the few private firms that were equal to the task of building battleships and cruisers; and we urged that if the United States followed the practice so successfully initiated by foreign governments, of building a certain proportion of naval vessels in private yards, a spirit of rivalry would be provoked which would undoubtedly accelerate the speed of construction in these yards. The last Congress, in making appropriations for the two great battleships of 16,000 tons displacement, decided that one of these ships should be built in a private yard and one at a government navy yard. The "Louisiana" was awarded to the Newport News Shipbuilding Company, while the task of building the "Connecticut" was intrusted to the New York navy yard, at Brooklyn.

We present a photograph of the "Louisiana" taken on the first of April, which shows the advanced condition of this vessel on that date, when she was about one month ahead of the contract time of forty-two months. This contract was let on October 15, 1902, and had her construction proceeded at the rate which has marked some of the battleships of our navy yard, there would have been practically nothing to show on the ways at the date of this photograph. Indeed, the contractors themselves admit that the vessel is already about six months ahead of the ordinary rate of progress under normal conditions. Although this satisfactory showing is to be attributed largely to the natural spirit of rivalry provoked by the placing of a sister ship at the navy yard—a new departure which was bitterly opposed by all the shipbuilding interests that have been accustomed to undertake naval contracts—there is no question that much of the credit for the rapidity of construction is due to the fact that the Bureau of Construction and Repair have been granted sufficient time for working out the designs of these two ships, not merely in general outline, but also to the fullest details, and that they have been enabled to draw up most exhaustive specifications, drawings, and standing instructions to the superintending constructors. In a recent issue we commented editorially upon the report of the Chief Constructor of the Navy on the subject of the great delay in the completion of warships, in which it was shown that this delay might be largely attributed to the incompleteness of plans, which were prepared in great haste with a view to starting contracts for vessels as soon as possible after their authorization by Congress. A further cause of delay was the changes in the disposition of armor and armament, or in the details of designs after awarding the contract—changes which were the inevitable result of the haste with which the preliminary plans, upon which the contracts were based, were drawn up. The specifications for building these two ships, however, are so elaborate and exhaustive that they make a printed volume of 251 pages, in which details of the ship's construction are specified with great minuteness. As a consequence, the contractors are able to make out their bills for material, and order the same, without the uncertainty and fear of possible changes which have been such a drawback upon ships already constructed.

A photograph of the sister ship "Connecticut" at the navy yard would show that her keel is laid, and a large amount of her framing and general construction material is on the ground ready for erection. While the ship would make no such showing as is seen in the accompanying photograph, it must be borne in mind that before beginning the construction of the "Connecticut," it was necessary to build huge ways, some 500 feet in length and 70 or 80 feet in width, and to erect a great steel traveler with which to handle the material in building the vessel; so that the "Connecticut" has been handicapped to this extent. After allowing for this delay, it will be found that the progress upon the navy-built ship is quite satisfactory.



SPEED IN BUILDING WARSHIPS.

Photograph of the 16,000-Ton Battleship "Louisiana," Showing Her Advanced Condition on April 1st—Six Months After the Signing of the Contract.

"LOOPING THE LOOP" IN 1846.

The Coney Island centrifugal railway, which goes by the winning name "Looping the Loop," has found its way to Paris. Two music halls of the lively French metropolis are at present entertaining their patrons with exciting journeys on this astonishing piece of apparatus. In the effort to outdo his rival, the proprietor of one of these music halls claimed that his "*boucler la boucle*" is under the direction of the only true and genuine inventor.

This claim of originality to the invention aroused the suspicion of one of the staff of the French weekly L'Illustration. Searching through the files of his paper, he found in the issue of September 12, 1846, the picture of which we herewith publish a reproduction. J. F. Gall in La Nature has carried out a similar and more exhaustive investigation, and proved that a certain Clavières was the inventor of the centrifugal railway.

It seems that as far back as 1833 the idea had been discussed; but it was not until thirteen years later that it was finally realized by Clavières, who was then an engineer at the Parisian Hippodrome. Daguin in his excellent "Traité de Physique" gives an illustrated account of Clavières' railway. So popular did "looping the loop" become that other countries soon adopted the contrivance. According to Clavières' plan, the track, after a sharp descent, was curved into a circular loop and then extended into an upward incline. The car, in traveling on the two rails constituting the track, plunged down the first incline at a terrific speed, whirled around the loop and ascended the second incline. In those days people were more fearful than the modern New Yorkers who visit Coney Island and boldly seat themselves in the car, utterly regardless whether or not they will come out uninjured.

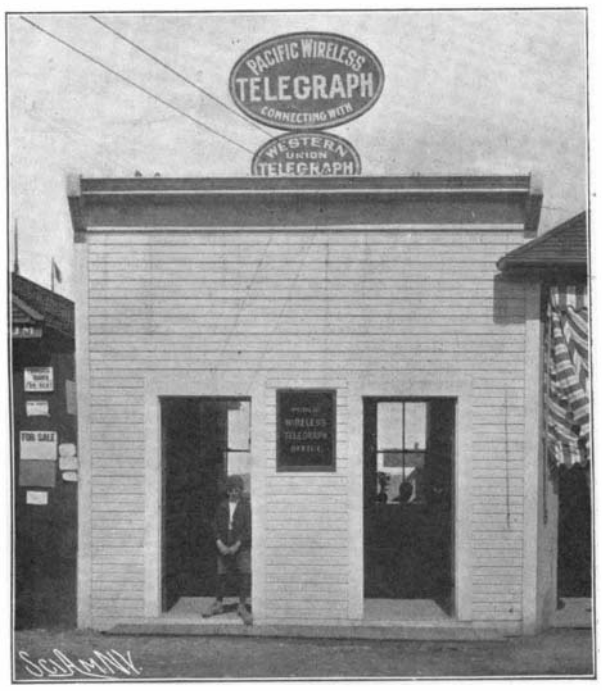
In order to convince people how safe his railway was, Clavières filled the car with monkeys. It was not until the safety of "looping the loop" was thus conclusively demonstrated that men and women were willing to enjoy its doubtful pleasures for two sous.

In 1846 Clavières' aerial centrifugal railway (or as he dubbed it, *chemin de fer aérien à force centrifuge*) found its way to the Frascati Gardens of Havre, Bordeaux, Lyons, and other towns. Our picture shows the "Looping the Loop" arrangement of the Frascati Gardens, Havre.

In describing this fearful and wonderful construction in 1846, Le Journal du Havre states: "At 11 o'clock this morning the aerial railway was tested. We call it an aerial railway, since its starting point is 9 meters above the ground. For a distance of 32 meters the road drops 44 centimeters per meter. At the end of the downward incline, the car enters a circle 4 meters in height, about which it is whirled at incredible speed, thereupon traveling 18 meters up an

"LOOPING THE LOOP" IN 1846. FROM A CONTEMPORARY WOODCUT.

incline of 28 centimeters per meter. It would be difficult to imagine a spectacle more curious, more interesting. The experiments were made in the presence of M. Dumon, Minister of Public Works. As he entered the Gardens, the carriage, filled with two bags containing each 30 kilogrammes of sand, shot down with frightful rapidity, and, after having encircled the spiral, came to a stop beneath the windows of the first story of the house occupied by Madame Aguado,



PACIFIC WIRELESS TELEGRAPH OFFICE.

with such precision that a bouquet of flowers would have fallen more heavily at the feet of the noble lady. M. Thiers was present at the trial. He complimented M. Clavières, the engineer, in the most flattering terms on the accuracy of his calculations, on the precision with which he had solved the problem of centrifugal force. The next day, living passengers took the place of the bags and returned sound and well after their exciting experience." History does not record the emotions of Madame Aguado, "the noble lady."

"Looping the Loop" soon went out of fashion. The public in that day was just as fickle as it is now. About 1865, however, an ambitious Barnum thought it would be a most excellent scheme to equip the Circus Napoleon with a centrifugal railway. The car, however, was derailed on the very first trip, and the Prefect of Police, who was at that time M. Boitelle, forbade further harrowing journeys. After a lapse of nearly half a century, the centrifugal railway again made its appearance, this time in America, at Coney Island. The particular form here adopted developed into the more dangerous "Looping the Loop" for bicycles. The principle still remains substantially the same as in the old days. Still another modern instance justifies Solomon's old saw.

SANTA CATALINA'S WIRELESS NEWSPAPER.

BY CHARLES F. HOLDER.

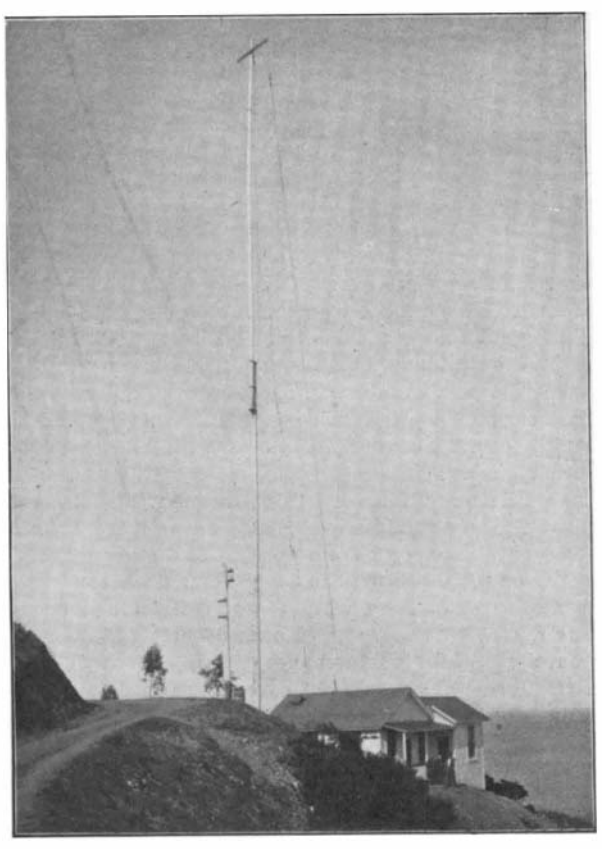
The island of Santa Catalina is a part of Los Angeles County, Southern California, lying about twenty miles off shore, parallel with the mainland. The principal settlement or town is at Avalon, on the southeast, where one of the quaintest hamlets of the coast has grown up, having a summer population of six thousand or more and a rapidly-growing one in winter. The locality has much to recommend it—an almost perfect climate the year around, and sports and pastimes which have given it a world-wide reputation.

There has been one drawback to Santa Catalina, and that was the lack of telegraphic communication. In summer there are from two to three boats daily; but in winter only one, the steamer arriving at noon. For twenty-four hours the island was virtually without communication with the mainland. To remedy this, the Banning Company, who own the island, established a pigeon route. Large flocks of these birds were trained, and telegrams or important news were sent in this manner with success, the birds taking a message from Avalon to Los Angeles, a distance of fifty-five miles, in about an hour. The pigeon houses were so arranged that when a bird arrived with a message it rang an electric alarm in the receiver's home or office, thus calling him up.

But there was an element of uncertainty in this. Sportsmen who did not know that the birds were tame shot them *en route*. Others died of over-exertion. In the main the service was satisfactory, but so many prominent men visited the island that the need of adequate means of communication became more and more urgent. Finally Gen. A. L. New, vice-president of the Pacific Wireless Telegraph Company, suggested the installment of a wireless telegraphic plant. A point was selected north of Avalon Bay on the conspicuous headland that culminates in Sugar Loaf rock and is reached by a well-built stage road. Here the mast was erected and the office built, the latter being connected with a main office on Ocean Avenue, Avalon. The instruments used, notably the receiver, were designed by Mr. Swenson.

The nearest mainland point is at San Pedro, about thirty miles distant, and from the time the office opened for business to date, about six thousand messages have been sent without a single error or a moment's delay. The plant has been subjected to some severe tests. During the last of March a terrific storm of wind and rain very nearly cut off boat communication with the island; yet the messages were sent across the channel with directness and precision.

It is interesting to note that while the London Times is experimenting with "marconigraphs," endeavoring to test the accuracy of the system, the Pacific Wireless Telegraph Company has been for several weeks in business, supplying Santa Cataline through a daily paper, the Wireless, with all its news. The Wireless is a small newspaper containing the condensed news of the day—a perfect busy man's paper. The Avalon Wireless publishes every morning the news of Santa Catalina, the latest catches of great game fishes on the Isle of Summer, as well as the telegraphic news of the world, sent across the channel during the night.



THE PACIFIC WIRELESS TELEGRAPH STATION.

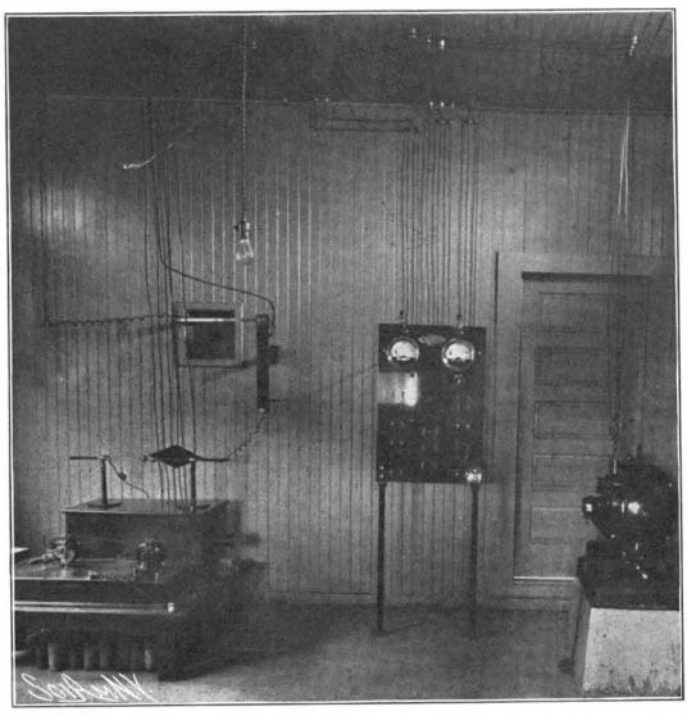
DUST STORM OBSERVATIONS.

Prolonged and elaborate researches have been carried out by two eminent scientists, Profs. Hellman and Meinardus, relative to the dust-storm which swept over the coasts of Northern Africa, Sicily, Italy, Austria-Hungary, Prussia, part of Russia, Denmark, and the British Isles between March 12 and 19 of 1901, and the results are of valuable interest and importance to meteorological science. Dust storms on a large scale are rare occurrences even in Africa. The track of this storm was traced by Profs. Hellmann and Meinardus with accuracy, and its origin located. The dust originated in storms occurring on March 8, 9 and 10 in the desert of El Erg, situated in the southern part of Algeria, which carried the dust and transported it northward. It began to fall at Algiers and Tunis in a dry state on the night of the 9th. The subsequent falls gradually took place northward, first Sicily, then Italy, the Alps, Austria-Hungary, Germany, Denmark and European Russia, in the order named, receiving their share. In Sicily and Italy the dust fell without the aid of rain, but elsewhere it was only noticed during or after showers. The quantity of dust deposited on the earth gradually became less as it traveled northward, while the fineness increased as the quantity diminished. The dust was not distributed homogeneously over the land surface, but in patches and streaks, some places being entirely free from it, while in others the fall was specially dense. The unequal distribution and different values for the rate of movement of the dust cloud are explained by the variable velocity of air currents and the changing position of the barometric depression. The investigation has conclusively proved that the dust was carried by a large mass of air which moved with great velocity from Northern Africa to the north of Europe, and that this mass of air, cyclonic in character, was led on its western side by air currents from the north, and on its eastern side by southerly currents. The total amount of dust that fell to the surface on that occasion is roughly estimated to be about 1,800,000 tons, of which at least two-thirds were deposited to the south of the Alps.

All the microscopic and chemical analyses point to this dust being neither volcanic nor cosmic, but solely such as is found in the Sahara desert and other parts of Africa. It was different with the dust showers which succeeded the eruptions of Krakatoa in May and August of 1882, which were collected at various distances, the greatest being more than 1,100 miles from the seat of the disturbance. In our latter instance the dust collected was invariably of volcanic origin, and the tremendous height to which the particles were thrown, coupled with the movement of the air at that altitude, was responsible for the dust remaining suspended in the atmosphere for so long, and also for the brilliantly-colored sunsets observed nearly all over the world. Dust-falls afford a means of obtaining further knowledge of the actual movements of the air currents in the higher reaches of our atmosphere which cannot be gained by any other methods, and are therefore of great meteorological value, but it is seldom that the fall occurs over an area where such useful data can be secured as was the case with the dust-storm of March, 1901.

The Current Supplement.

The current SUPPLEMENT, No. 1427, is in every way a noteworthy number. Mr. Day Allen Willey has prepared a full account of the famous Krupp works at Essen, which account is to appear in two installments. The first installment is published in this issue. Admirable illustrations add much to the interest of the text. Radio-active substances, the nature of which is still but ill-understood, are discussed in a valuable article by the famous chemist Becquerel. Mr. Guarini concludes his exhaustive review of the development of Marconi's system of wireless telegraphy. Sisal fiber has already been discussed in the SUPPLEMENT. Additional information on the fiber is now published, together with reproductions of some striking photographs. Lieut.-Col. H. A. Yorke, an English army officer, recently visited the United States for the purpose of studying American railways for the London Board of Trade. His report is published in the SUPPLEMENT. The launch of the Argentine cruiser "Moreno" is described and illustrated. W. J. Tennant explains in a simple way, without mathematics, the principle of the planimeter. A. Gehlen presents a scholarly summary of the latest researches on the discovery of America by the Northmen.



INTERIOR OF THE SANTA CATALINA WIRELESS TELEGRAPH PLANT.

The North-Eastern Railroad of Great Britain, which decided a short time ago to adopt motor cars upon a certain section of its system, has had three types of motors already delivered to it for experimental purposes. The cars are fitted respectively with a 33 horse power Napier, a 95 horse power Wolseley, and a 100 horse power Automotor engine. There is a special interest to automobilists attached to the trials with these respective motors, since they will afford some conclusive data regarding the advantages and disadvantages of horizontal and vertical engines, as they will run under precisely similar conditions. The Napier and Automotor engines represent the vertical engine, and the Wolseley the horizontal motor type.