LOSS OF THE LARGEST SHIP EVER WRECKED.

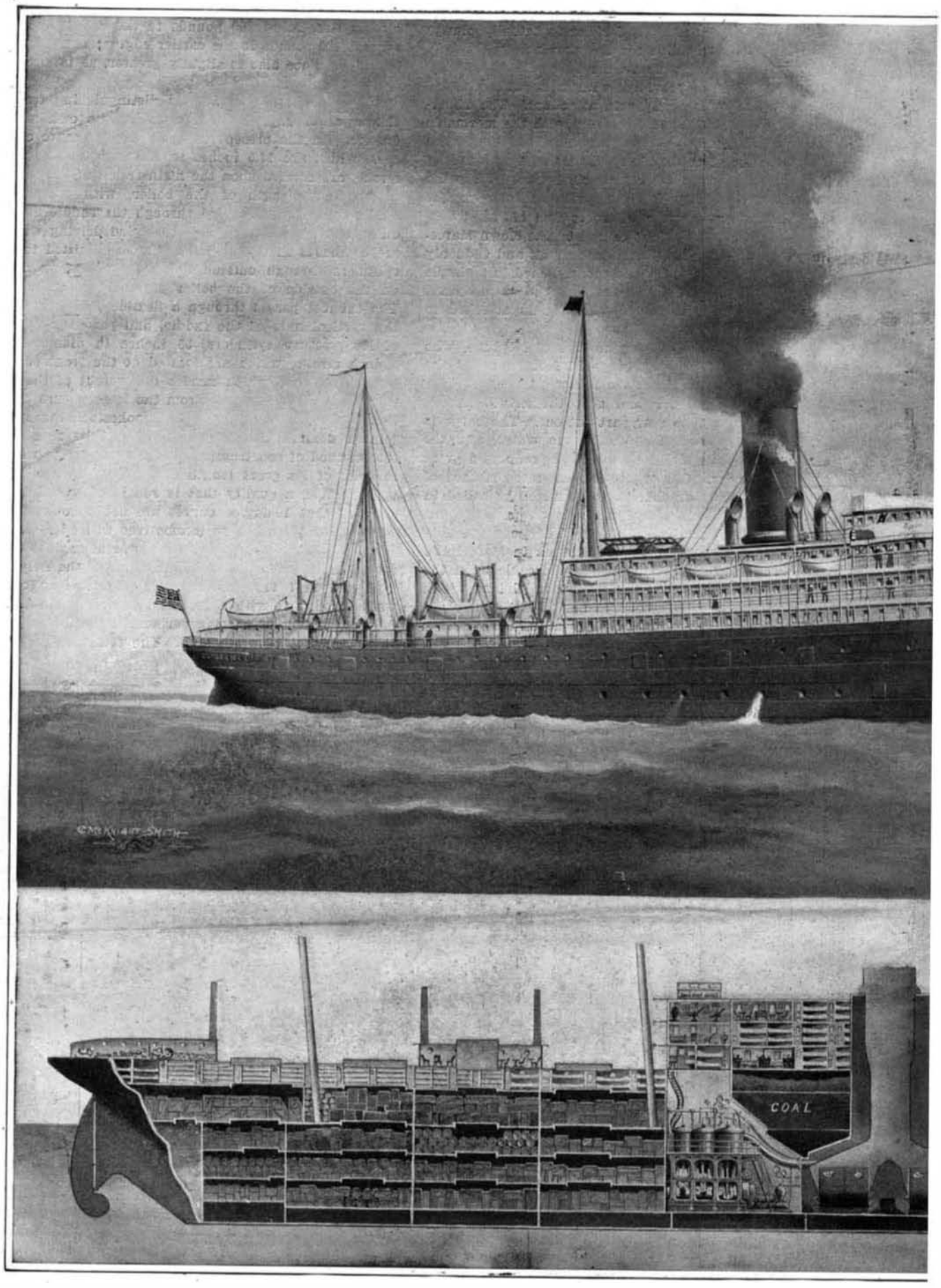
The accompanying photographs, recently received from a correspondent at Yokohama, Japan, show the loss of the largest vessel that ever was wrecked upon the high seas. In respect of the size and value of the ship, this shipwreck is altogether unprecedented; although we are pleased to record that the disaster was free from the usual loss of life, every one of the passengers and crew being taken ashore.

The "Dakota," and the sister ship, the "Minnesota," are both the largest vessels ever built in the United States and the largest that ever flew the national flag. They owe their existence to the energy of Mr. James J. Hill, who built them expressly for the trans-Pacific trade between Seattle, the terminus of the Great Northern road, and the Orient. A curious feature in connection with the construction of these ships is that a new company, known as the Eastern Shipbuilding Company, was formed expressly for the purpose of building them. Moreover, the company took the contract before it possessed the plant, the equipment, or even the ground upon which to build them. A site was ultimately chosen opposite New London, Conn., and here the two huge vessels were constructed, side by side. The dimensions of the "Dakota" are: Length, 630 feet, breadth, 73 feet, and molded depth, 56 feet. On a draft of 33 feet the displacement is about 33,000 tons; and on a maximum draft of 36½ feet, it was claimed that the "Dakota" had a displacement of 37,000 tons, which placed her within a few hundred tons of the maximum displacement of the White Star liners "Cedric" and "Celtic," the largest ships of that day, which measured 700 feet by 75 feet. It is the greater depth and fuller model of the "Dakota" and "Minnesota" which bring their displacement so close to that of the longer and broader White Star boats.

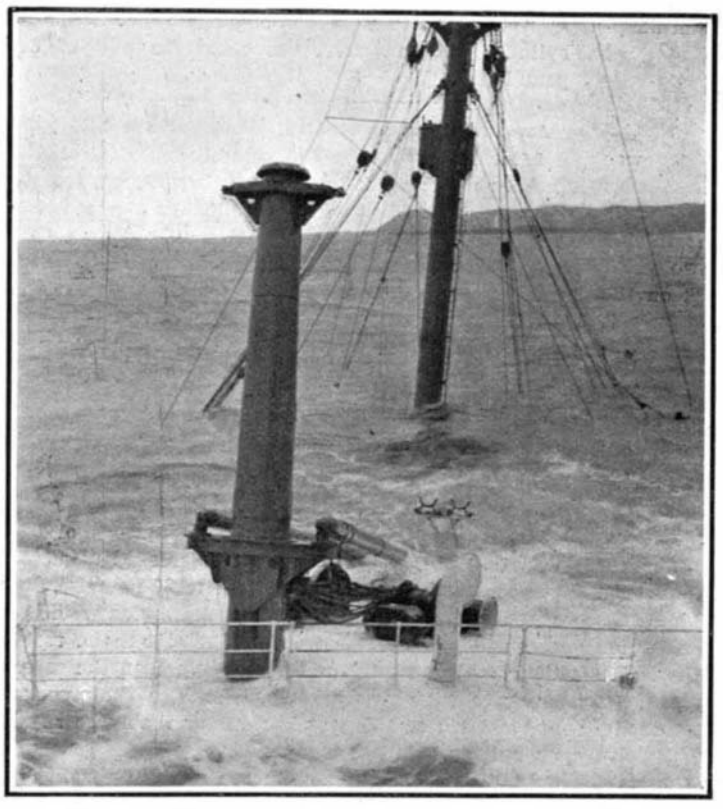
The accompanying drawing, representing the vessel at sea, and the inboard profile which gives an excellent idea of the internal arrangements of the vessel, show that the "Dakota" was in every respect thoroughly up to the best modern practice. Indeed, she was, in some respects, ahead of it; for new methods of construction were adopted in the "Dakota" which rendered her considerably stiffer and stronger than any vessels built for the American merchant marine. The outer plating of the ship's bottom was of 1¼-inch steel, and the shell plating was strengthened by an additional strake of 1-inch plating at the main and upper decks; also continuous 1-inch stringer plates were worked from stem to stern along these two decks as a stiffening to the regular deck plating, which, on the main deck, was 16/20 of an inch in thickness, and on the upper deck 18/20 of an inch. Furthermore, the ship was strengthened against hogging and sagging strains by a continuous central longitudinal bulkhead reaching from keel to upper deck. This was the first case of the use of an absolutely unbroken longitudinal bulkhead in a vessel. Then again the vessel received great longitudinal strength from the use of a new system of stanchions and girders. Instead of the use of a large number of pipe or tube stanchions, there were three lines of heavy box-section columns, measuring 13 x 24 inches and spaced 20 feet apart. The deck loads were carried on continuous lines of 13 x 24-inch box girders to which the box stanchions were riveted. This arrangement, it will be seen, is not only economical in distribution of material, but adds greatly to the longitudinal stiffness.

The stiffness of these vessels was also enhanced by their great plated depth of 56 feet. From the outer bottom to the navigating bridge there are no less than eleven distinct decks or platforms. First there are the outer bottom; the inner bottom; the orlop; lower; between; main; and upper decks; all of these decks are of steel plating and are contained within the molded structure, 56 feet in height, of the hull. Above the upper deck are the promenade; the upper promenade, and the boat decks, the last-named being 81½ feet above the keel. The "Dakota" had accommodations for 150 first-class, 100 second-class, 100 third-class, and 1,000 steerage passengers. There were also quarters for the accommodation of 1,200 troops, and the ship could carry 20,000 tons of cargo.

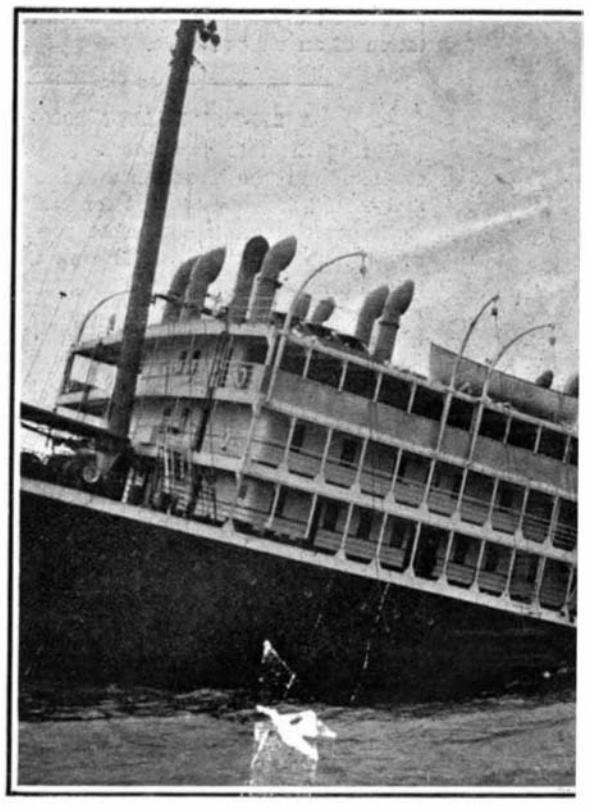
The disaster to the "Dakota" occurred on Sunday evening, March 3 last, when she ran on a submerged reef while she was about five hours' steaming from Yokohama. Either the blow must have been a terrific one, opening a huge rent in the vessel, or else the watertight doors must have been open; for the "Dakota" was of such great size, and was built with such ample watertight provisions, that she should have been capable of being kept afloat, or at least on a fairly even keel, even after striking as heavily as she did. Whatever be the cause, the ship very speedily filled, and sank into the position shown in the accompanying photographs. The vessel evidently is hung up on the reef at a point abaft of the center, with the result that her bow is buried up to the bridge, and, in spite of her great draft of over 30 feet, the rudder and propellers are lifted clear of the water.



The Fine Freight and Passenger Liner "Dakota."—The l

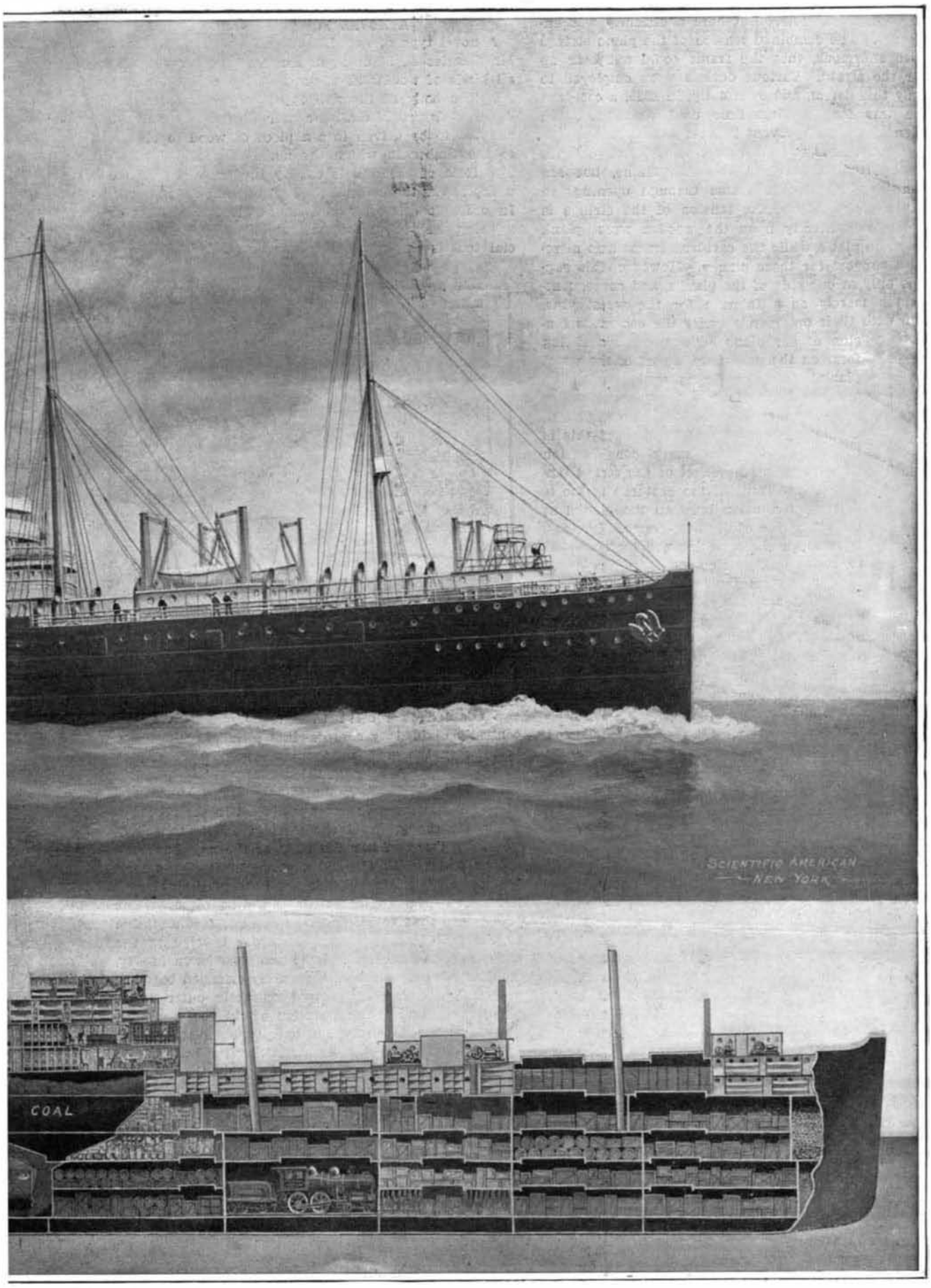


View from Promenade Deck, Showing Submerged Bow.

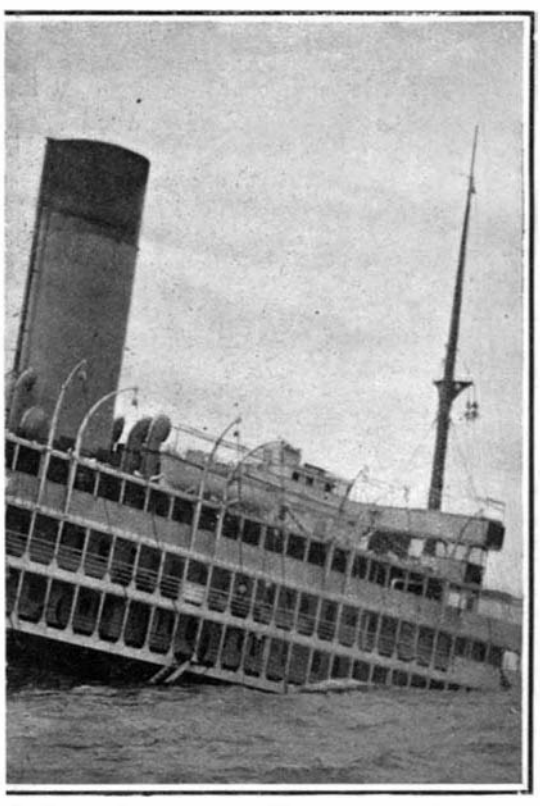


The 33,000-Ton "Dakota" on the Rocks

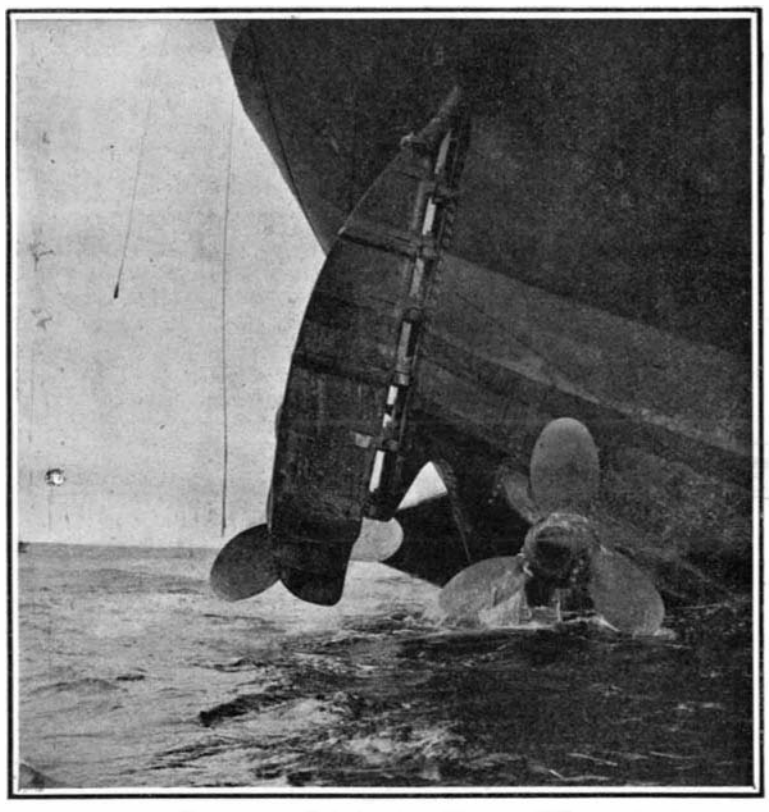
WRECK OF THE LARGEST SHIP EVER LOST



Largest Ship Built or Sailed Under the American Flag.



Near Tokio, Japan. View Amidships.



Propellers and Rudder Raised Clear of the Water.

IN THE HISTORY OF STEAM NAVIGATION.

The photograph, showing the partially submerged foremast and derrick of the ship, was taken by our correspondent from the promenade deck below the main bridge, and it gives a fairly accurate idea of the list to starboard. Looking right ahead through the rigging, one can see the Nogima lighthouse, which is built on the headland which forms the extreme point at the entrance to Tokio Bay. After the ship struck, she swung in toward the land, and consequently this photograph gives no idea of the way she was heading at the time of the disaster. Another photograph was taken from off the starboard side of the "Dakota," and shows the acute angle at which she lies. The third view, also taken from the starboard side, shows the propellers and the massive rudder entirely clear of the water.

The magnitude of this disaster, as affecting American shipping interests, is not understood by the American public. Not only is 20,000 tons gross register swept from the list of our deep-sea shipping engaged in foreign trade, but Mr. Hill has announced that he has no intention of replacing the vessel. Consequently, the gap which is thus opened will probably be filled by some Japanese line, and another serious setback will be suffered by the American merchant marine.

Aldehyde in Cheese.

Messrs. Trillat and Sauton, in a paper presented to the Académie des Sciences, describe their researches as to the presence of aldehyde in cheese and its action in giving a bitter taste. They found recently that the presence of ammonia and aldehydes in abnormal quantities in wines was capable of giving them a bitter taste even when greatly diluted, and advanced the hypothesis that the bitterness of diseased wines was due to the formation of an aldehyde resin. By analogy, they wished to see whether such resin was not the cause of an exaggerated bitterness of certain cheeses. They were able to show the presence, hitherto unobserved, of aldehydes in cheese. The operating method is as follows: Mixing 200 parts of cheese in the same amount of distilled water, it is introduced into a flask and has added 20 parts of a 1-10 sulphuric acid solution. Some 50 parts of the liquid are distilled over with proper precautions. The aldehyde is estimated by the color method with rosaniline. Fresh curds show no aldehyde, while different cheeses have varying amounts. It is to be noticed that the strongest amount is found in the cheeses which have a somewhat bitter taste. Owing to the absence of aldehydes in the curds and its presence in matured cheese, they may be considered as products of fermentation. The authors observed also the direct action of aldehydes upon cheeses and sought to produce the bitter taste artificially. Pieces of cheese are placed under a large bell jar in which is vaporized a few drops of acetic aldehyde, representing about 1-100,000 of the air volume. After a few hours the cheeses thus exposed take a yellow tint which becomes stronger and toward the end at the same time as the bitter taste develops. The phenomenon commences at the surface and then gains the central portions of the cheese. Carefully observing the development of the coloration and the bitterness, it is found that it is produced at first in the most alkaline specimens. Fresh curds, under the same conditions, give no color and do not become bitter. Comparative experiments show that the coloration and the appearance of the bitter taste are distinct, and that the presence of oxygen can hasten the coloring without increasing the bitterness. This is shown by exposing pieces of different cheeses to the action of acetic aldehyde vapors under two bell-jars of the same dimensions with and without air. To resume, the authors show the presence of aldehyde in cheese and demonstrate the relation between its presence and the appearance of the bitter taste. They also point the analogy which seems to exist between the rôle of aldehyde in the aging of wines and the ripening of cheeses.

How to Find the Time With a Handless Watch.

Some time ago a poor old peasant who had invoked the king's wrath was seized by the king's soldiers and placed in a dungeon. His Majesty was present, and had the old man searched before being incarcerated. All his personal property consisted of a cheap watch, a small penknife, a shilling in cash, and a lead pencil. The poor old man begged for mercy, but his pleading availed him nothing, and he finally asked to be granted the privilege of knowing the length of his sentence. In reply the king took his knife and watch, which lay on the table, and after taking the knife and prying the hands off the watch, returned to him his watch, saying, "When you have learned to tell the time correctly by this watch in your dungeon cell, you will be liberated." The poor old man, knowing that the king meant a life sentence, staggered into his cell and wept bitterly. Nevertheless, he was liberated in twenty-four hours, having accomplished the wonderful task of telling the correct time in the dark with a watch without hands. How did he do it?