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SECRETARY HERBERT'S REPORT ON THE TEXAS.

The official statement of the Secretary of the Navy on the recent sinking of the Texas at the Brooklyn navy yard will go far to re-establish the confidence of the American public in this vessel. Mr. Herbert states that in giving out the action of the department on the finding of the recent court of inquiry he has concluded to depart from his usual custom and make a general statement about this ship. We are informed that the accident was due to the fact that a part of an injection pipe had been taken out for repairs, and that the accident "could not have happened at sea." He reviews the past history of the ship and states that as the result of a competition of naval architects a board of eminent naval officers awarded the prize to a prominent English designer, Mr. John. This was done in accordance with the policy by which "we were availing ourselves of the experience of foreign nations." Since her launch various defects have developed themselves, and among other changes she was sent to the navy yard at Norfolk to have her bottom stiffened. It is now believed that all defects have been remedied except those relating to her turrets and the system of water-tight compartments, which latter were developed by the recent flooding of the vessel, as shown by the finding of the court of inquiry. Mr. Herbert points out that while it would be desirable that all our ships should be turned out in perfect condition, this has never been accomplished in our own or any other navy. It is believed we have made fewer and less costly mistakes than most other nations in the building of a modern navy, and yet the Castine and Machias had to be cut in two and lengthened; and three other ships, the Detroit, the Montgomery, and the Marblehead, required "far more fundamental changes than have ever been found necessary in the Texas." Nevertheless, the latter for some reason or other, has been the subject of an unusual amount of harsh criticism.

We are glad to learn that such officers as Capt. Glass, her commander, and Capt. R. D. Evans, commanding the Indiana, unite in declaring that the Texas is "the stiffest, most easily managed, and entirely seaworthy ship in the service." Capt. Evans states that in the hurricane of October 12 she showed herself to be the most seaworthy ship in the fleet, rolling considerably less than the Indiana and the Maine, which were just ahead and just astern of her. The captain also states that she was a perfect gun platform, and in this respect, and in respect of her seaworthy qualities, was superior to such fine ships as the New York, the Columbia, and the Raleigh.

The Secretary then goes on to quote from a letter from Charles H. Cramp, in which the writer says: "I have always defended her (the Texas) to an extent that has made me obnoxious to many officers in the navy, who were bitterly opposed to the adoption of Mr. John's scheme." After examining the plans and specification, Mr. Cramp stated that they were "good, symmetrical and practicable;" that they were by odds the best submitted in that competition; and that while the scantlings were light, "as a whole her hull construction involved the best mechanical distribution of minimum weight" that he had ever seen. At that time the era of steel was new and there was a tendency to over-estimate the strength of the new material. This led to the placing of very heavy armor and armament on small displacements, and the Texas is a practical instance of this tendency. The latter part of Mr. Cramp's letter is devoted to strenuously deprecating public criticism and discussion of the defects of naval construction by the press, which he considers unwise, for the reason that such criticisms are used abroad to the prejudice of our industries when they enter into competition for foreign work.

The Secretary calls especial attention to Mr. Cramp's remarks about the effect of criticism by the press of American ships and armor plate. He says, "I submit Mr. Cramp's letter for the purpose of pointing out to some of our newspaper friends the unintentional injuries to American interests that are liable to result from enlarging upon minor mistakes that may have been committed, even though at other times full credit be given for the great and substantial successes that have been attained."

We do not agree with Mr. Cramp in his opinion of the value and effect of newspaper comments upon naval work. Such criticisms are not confined to the American press, as readers of any of the English technical journals can testify. There is never a new design for British warships published but what it calls forth a storm of hostile criticism, and the same thing obtains in France. It is the privilege of the public which pays for the ships to have its say about them, and while there is a great deal of matter written which is arrant nonsense, there is much other criticism which is intelligent and to the point and healthy in its general effect. If, as Mr. Cramp says, such criticism has occasionally robbed this country of contracts for building foreign warships, it is to be regretted; but we think that such an occasional loss is not a sufficient reason for asking the public to suspend its right to pass judgment upon or discuss the merits and defects of its new navy. It has been a difficult task to awaken the people at large

to the necessity of a navy at all, and there has been no agent so active in this awakening as the daily and weekly press.

On the whole, the statement of Secretary Herbert is reassuring, at least to that part of the general public which has been disturbed by the exaggerated statements regarding this ship which have been put forth from time to time by the ultra sensational element of the daily press. We regret, however, that more explicit information has not been given regarding the flooding of the Texas and the causes which led up to it, and more particularly, as it concerns the failure of the so-called watertight bulkheads. In our remarks on this accident in a previous issue, we took it for granted that the watertight doors must have been open. It appears, however, that they were closed, and, therefore, for the purpose of fulfilling their function they seem to have been utterly worthless. This, we consider, is by far the most serious aspect of the case, and we fail to find any reassuring statement or suggestion in the present official utterance. We are told that the accident could not have happened at sea. Why not? Is there any peculiar and unknown quality in the metal of a valve yoke which causes it to hold together when a ship is in thirty fathoms of water and only break when she is in thirty feet? If it is safe to remove a part of an injection pipe for repairs when a ship is afloat, it is just as safe to do it in sixty feet as in thirty feet of water; and it is due to the lucky fact that the Texas lay where she did at the time of the accident that an appalling accident did not take place and she is not to-day at the bottom of the river.

Even if it is allowed that the removal of a section of the injection pipe is a proper thing to do outside of a dry dock, and that valve yokes are not likely to break at sea or when the ship is in deep water, how came it that the engine room bulkhead did not keep the ship afloat? It is suggested that possibly valves were open in the bulkhead; but surely such a court of inquiry was capable of ascertaining to a certainty whether they were or not. If they were, the failure is explained; if they were not, the compartment system of the Texas is a miserable failure.

We must confess to considerable disappointment that explicit information is not given upon this very important point, and that the direct responsibility for the disaster is not distinctly placed. It is evident to the veriest novice in naval matters that by taking the most elementary precautions this accident would have been avoided. All the elaborate and costly appliances of a modern warship are worth about their weight as old junk if they fall into the hands of individuals who fail to exercise proper forethought and discretion in handling them.

We cannot but feel that in its report, as outlined by the Secretary of the Navy, the court of inquiry has passed very lightly over an occurrence which calls for a detailed explanation, and that in deciding that no one was responsible for the mishap, it has shown a leniency that does more credit to its heart than to its judgment.

That in time of peace a battleship should founder at her wharf, with watch on board and fire in her boilers, is, in our judgment, absolutely inexcusable.

THE PREVENTION OF RUST IN IRON AND STEEL STRUCTURES.

The advent of the age of iron and steel in the arts of building and manufacture brought in an element of decay which scarcely existed in the age of stone. For while we are able to build on a grander scale, and combine the new material in daring forms which the primitive ages merely dreamed of and never attempted, we cannot look upon our finished works with the same assurance of their permanence that filled the builders of the Egyptian pyramids or the temples of Greece and Rome. Often when the stone was hewn from the quarry and exposed in a building to the wear of the elements it hardened under the exposure. Nature was thus the friend of the architect, and dealt kindly with his work. The very winds and weather which colored it with the mellow tints and peculiar beauties of age gave it strength as lasting as that of the hills themselves.

But the iron and steel of modern construction are as perishable as they are strong. The action of the elements, which sometimes prolonged the endurance of an ancient structure, commences to destroy our modern works in iron and steel from the very first moment of contact. Unless some thorough system of protection be adopted, it is certain that the life of the skeleton steel buildings, for instance, which are multiplying so fast in our cities, will never be measured by centuries. The dangers of decay are serious indeed, even in the case of such ironwork as is open to inspection; for in certain climates the oxidation is so rapid that it takes a comparatively brief time to reduce the section of the metal, so that it is brought perilously near to the breaking point and far below the proper margin of safety. Notable instances of rapid decay may be found in some of the more neglected parts of the viaducts and bridges of this city, where, for the want of thorough and frequent painting the ironwork is being eaten away under

the combined attack of the moisture and salt air of our climate.

But although structural ironwork is open to the attack of an alert and ever present enemy, it is well understood that so long as its parts are open to inspection and may be reached by the paint brush its life may be indefinitely prolonged. If they are carefully cleaned, and coated with good paint at the time of erection, subsequent inspection and repainting systematically carried out will render our iron and steel structures practically imperishable.

The introduction of the skeleton system of building, however, has brought with it new and comparatively untried problems. The methods of construction which are used to insure the integrity of the steel work are radically different; for whereas the bridge builder is careful to leave all the parts of his structure exposed, the builder of the "skyscraper" is just as careful to cover them up. This concealment is rendered necessary in the case of the columns that carry the outside walls by the demands of construction, and the interior columns and floor girders are inclosed in the endeavor to secure a fireproof construction. The nature of this covering varies but little. It usually consists of stone or common brick or some form of fire brick, and when the steel members are once sealed up from sight, the question of their actual condition as the years pass by is a matter for speculation, but never a matter of certainty.

It is true the columns and girders are treated to a coat of paint at the shops, and no doubt in many cases there is an attempt to do this work thoroughly and with a good quality of paint; but there are thousands of tons of material that go into the buildings with the work carelessly or cheaply done. And even where the steel has been honestly painted at the shops, the subsequent handling in transportation and in erection at the building does more or less damage to the paint, rubbing it off and exposing the metal. Nevertheless, there is no effort made to repair the damage, and the girder or column, as the case may be, is shut up within a porous and not always an airtight casing, in which the rusting of these exposed surfaces is free to go on unseen and unchecked.

It is unfortunate that we have very few facts to go upon in estimating the behavior of inclosed steel or iron work. This style of construction is so modern that there has not been sufficient lapse of time for any reliable data to be gathered; and such cases as have been quoted for or against the permanence of walled-in iron work are few in number and stand good only for the particular circumstances that surround them. If a column which had been built into an interior wall was found free from rust at the end of a certain number of years, it would be no proof that another column built into an outside wall and on the weather side of the building would be equally secure. And we must not argue that, because there was no oxidation of a structure in the dry air of the city of Denver, five or six thousands of feet above the sea, a similar structure in the moist atmosphere of a sea coast city would escape injury.

The painting which the steel work receives at the shops should, at least, be repeated when it has been erected in place, so that any spots where the paint has been chipped or rubbed off, exposing the metal, may be protected from the action of the air.

In its way, this question of the rusting of covered iron work is as important as that of fireproofing; but it is not likely that it will receive the same careful attention; for the reason that, while the latter question is one of ever present, vital importance, the former is slow in its action and affects a more or less remote posterity. And yet, if there are duties which we owe to posterity, surely this is one. If by a little reasonable care, and an expense only slightly greater than that which is at present incurred, the costly buildings of to-day may be saved from a possible ultimate collapse, the care should certainly be taken, and the expense incurred.

Blockade of the Underground Trolley Line on Lenox Avenue.

During the snow storm of Wednesday, December 16, the underground electric trolley line on Lenox Avenue was disabled for several hours. This is the first time that this line has succumbed to the weather, and as the underground trolley system may be said to be yet on its trial, the facts concerning this breakdown will be of interest. It seems that when the storm came on, only about one-half of the usual amount of power was available, for the reason that half of the generators at the power station are at present being rebuilt. According to the chief engineer's statement, this would have been sufficient to keep the cars running under ordinary circumstances; but the mechanical resistance of the snow and the slippery condition of the rails, preventing adhesion, proved too much for the motors. After the snow plows and sweepers had opened up the line, a sudden drop in the temperature caused a coating of ice to form on the conductors, and thus prevent full contact. The conductors consist of two wrought iron pipes, one on each side of the slot, which are carried on insulators attached to the ceiling of the conduit. The difficulty of ice forming on the wires is not unusual with the

overhead trolley, but one would have thought that the protection of the closed conduit would have prevented such an accident. The difficulty was overcome by equipping the car with knifelike scrapers which cleared the conductors of ice just ahead of the contact shoes. By the time the cars were ready to run again after the scrapers had been attached, the conduit had filled up with snow and slush, and the tracks were so covered that it took several hours to get started. It is the intention of the company to equip every car with removable plows specially designed for keeping the conductors clear of ice. In some of the northern cities and in Canada, it has been a common thing during a storm of sleet to put a man on the top of the cars of an overhead trolley line, who carries a forked spear with which to scrape the ice off the wires. We are informed that this blockade will have no effect upon the determination of the company to equip the Fourth and Sixth Avenue lines with the underground trolley system.

Traps for Inventors.

In this nineteenth century the profession of patent solicitors is degenerating from the professional to the commercial. Inventors and patentees have their attention arrested by flaming announcements, with the object of catching unwary inventors and patentees. One class of these agents offer medals as certificates of value of inventions, and large lottery prizes, amounting to thousands of dollars, to inventors who place their applications for patents in their hands. However, before a medal or prize is awarded these inventors selected, in order to become acceptable competitors, they are compelled to pay into the hands of these agents certain fees. These competing inventors are told, or induced to believe, that a scientific and mechanical corps of experts in the employ of these agents make crucial examinations of their inventions, in the light of the prior state of the art, and the inventions of all others who are competing for a medal or the prizes, and in due time they respectively receive a communication from their agents, accompanied by a medal, certifying that they have been awarded the medal by a corps of experts, on the ground that the invention is determined to be the best of all others presented to them for patents. At some subsequent period it is announced that the money prize has been awarded to A, B, or C.

It would seem that intelligent men would not fall into such traps in this enlightened age; but, alas! they, like innocent lambs, are led to enter and made to suffer; or are dealt with in the same manner as are unsophisticated rural citizens who fall into the hands of "green goods" merchants.

For many years the story of the gold [gilded] medal awarded by a French scientific society to United States patentees has been well known, and yet victims are constantly being made. When the announcement is received from Paris that the gold [gilded] medal has been awarded to a United States patentee for his invention, after an examination by its savants, and it has been found to be the best of the kind patented, there is a demand for a considerable sum of money to pay the expenses of the transmission of the medal to this country. The expectation of receiving this sum of money is the secret of all the interest that this French association manifests in regard to United States patentees. A bald attempt to get money for a gilded medal, issued by a set of questionable persons, ought to be understood by intelligent patentees when they read the word "gilded" in small letters, inclosed in brackets, following the word "gold." Such medals, whether American or foreign issues, should not be accepted by inventors, or investors in inventions of others, as proof of merit. They are nothing more than sawdust sold by "green goods" men.

Recently an inventor applied to one of the United States medal awarding patent agents and received a medal, but no patent; and after he had expended about \$175 as fees to this agent and to the Patent Office, he made a visit to Washington, D. C., and called on the chief of police in respect to his patent business, and finding that his money was wasted and beyond recovery, requested him to refer him to an honest, reliable and capable patent counselor and solicitor, and being given the name of a respectable house in Washington, he visited the same, and on entering the door he said, "I am referred by the chief of police to you, as the kind of patent solicitor I am seeking. I do not want a medal awarded me, for my medal has cost me \$175, and no patent has been granted me. I want an honest, reliable attorney, who, when he takes my case, and I pay him my money, I can go home and feel satisfied that all will be done squarely, and I shall get a patent for my invention from the United States Patent Office, instead of a mere medal from my agent." The experience of this inventor ought to be a warning to others, and the course that he pursued should be followed by them.

Some years ago an advertisement appeared in the papers as follows:

"Wanted—An invention for sawing stone to a taper form; \$5,000 reward offered for the best invention of the kind for this purpose."

In response to this announcement, made, no doubt, by some designing, hungry patent agent, in conspiracy with an outside accomplice, for the purpose of increasing his income, several hundred inventors sent models of stone sawing machines to the Patent Office for patents. Nearly every one of these models represented two saws set to form an acute angle, and as the saws descended cut the stone to a taper form. One agent filed so many applications in the United States Patent Office, all like one another, that the principal examiner of the Patent Office in charge of this class finally became disgusted with such proceedings on the part of this agent, and wrote a letter to each of the later applicants substantially in these words: "Your application for a patent on a machine for sawing stone to a taper form has been examined and rejected on application of A. B., C. D. and E. F., filed through the same agency that has your case in charge." This was a sockdolager to the agent, and an eyeopener to his clients.

Sequel to the stone saw prize: At the termination of the period set for awarding the \$5,000 prize offered for the best stone sawing machine, these expectant inventors carried their models of stone sawing machines to a place designated in Vermont, and, alas! on exposing them to the supposed generous citizen who had advertised for the inventions, were told that none of the plans were as good as one which he had invented himself, and therefore the prize would not be forthcoming. Sad hearted and disappointed, they returned home with an experience which ought to last a lifetime. By this trap inventors were led to expend thousands of dollars for models, traveling expenses, and agency and government fees, with no profit to themselves, simply benefiting an unscrupulous patent agent and his accomplices. Inventors ought to look carefully before they bite at such bait.

Another trap set for patentees is the one that the Inventive Age, of Washington, D. C., has for many months been warning patentees against. This trap is the patent right selling agent, who sends to every patentee a letter, which letter says: "Your patent has been examined by our scientific board or corps of mechanical experts, and it has been pronounced to be worth \$25,000, or \$50,000, or \$100,000, and we would like to have the agency for selling your patent." Furthermore, offers are made to take out foreign patents on already issued United States patents for one-half the usual fees, etc. It is only necessary to say that patents in many foreign countries for United States patented inventions, which have been published in the United States Patent Office Gazette fully enough to be understood by practical mechanics, are invalid, even if granted by such foreign government.—New Ideas, Phila.

Do Not Lose or Throw Away Your Papers.

By taking only a little trouble, a paper first comes to hand, it may be kept in a way to form a permanent and most valuable addition to the reading matter with which all families and individuals should be supplied. We furnish for such purpose a neat and attractive binder, which will be sent by mail, prepaid, for \$1.50, or \$1.25 if sold over our counter. It has good, strong covers, on which the name SCIENTIFIC AMERICAN (or SUPPLEMENT) is stamped in gold, and fasteners by means of which the successive numbers may be placed and securely held in order as in a bound book. One binder may thus be made serviceable for several years, and when the successive volumes, as they are completed, are bound in permanent form, the subscriber ultimately finds himself, for a moderate cost, in possession of a most valuable addition to any library, embracing a wide variety of scientific and general information, and timely and original illustrations. Save your papers!

The Value of Good Roads.

Cultivating ten acres, eight miles from the station, I buy two tons of fertilizer for \$70, says a correspondent of the Leesburg (Fla.) Commercial. This quantity makes eight loads for one horse, and six hours are required for a trip. The time of myself and horse is worth 60 cents per load. I make 500 crates of vegetables, which require seventy-one trips to get them to the station, at a cost of \$42.60. On hard roads I could haul my \$70 worth of fertilizer in four trips of four hours each, at a cost of \$1.60. I could haul my 500 crates of vegetables in thirty-five trips of four hours each, at a cost of \$14. On the sand roads one horse is required seventy-one days to ship my crop, which is a longer time than the shipping season; hence I am compelled to keep two horses during the year, or hire from my neighbors at a busy time. The cost of keeping the second horse may be safely estimated at \$25. So much of my time is used in my trips to town that during three months of the year I am compelled to hire an extra hand, which costs me about \$45. The foregoing items will suffice to show that bad roads cost on my ten acre crop \$101.80, being a tax of over \$10 per acre.

WHAT better Christmas present can a father give his son than one year's subscription to SCIENTIFIC AMERICAN?