

THE LOSS OF THE BATTLESHIP "MAINE."

It would be scarcely possible to find in all the records of naval disaster, certainly not in those of the United States, a calamity so shocking and overwhelming as the loss of the battleship "Maine." It was misfortune enough that our navy, none too strong for its many duties, should be deprived at a stroke of one of its most efficient ships; but when to this is added the fact that the explosion which rent the ill-fated vessel asunder swept some 250 of our brave sailors into eternity, the disaster is comparable only with the sinking of the "Victoria," when 359 officers and men were lost, or that awful tragedy of an earlier day, when "brave Kempenfelt went down with twice four hundred men."

By the time these lines are in the hands of our readers they will be familiar with the details of the disaster, and it is likely that some reasonable theory based upon the condition of the wreck will have been offered as to the direct cause of the explosion. At the present writing public opinion is divided as to whether the explosion was due to accident or malicious design. If it was accidental, the cause must be looked for within the ship itself; but if the explosion was due to a deliberate act of malice or treachery, it is likely that the mischief was wrought by a torpedo or a sunken mine directed against the submerged portion of the hull.

The "Maine" has generally been known as a second-class battleship, though, more strictly speaking, she belongs to the class of armored cruisers. She was built at the Brooklyn Navy Yard, launched in the year 1890 and formed one of the most efficient ships of the new navy. Her principal dimensions were as follows:

Length, 318 feet; beam, 57 feet; draught, 22½ feet; displacement, 6,682 tons; coal supply, 400 tons; bunker capacity, 896 tons. She was driven by twin engines of 9,293 horse power at a speed of 17.4 knots and carried a complement of 354 officers and men. For her size she was heavily armed, carrying four 10-inch guns in two turrets, plated with 10 to 12-inch armor, six 6-inch guns, eight 6-pounder guns, eight 1-pounders and four machine guns. She carried two torpedo boats on her boat deck and was provided with no less than seven torpedo discharge tubes. Her belt armor was 12 inches thick and she had a continuous protective deck, from 2 to 4 inches thick, extending from stem to stern. Altogether, the "Maine," with her combination of good protection, heavy gun fire and torpedo fire and high speed, was one of the most useful ships in the navy.

The presence of the "Maine" in Havana Harbor was in strict accordance with international courtesy. She represented this country at the chief port of Cuba. Her mission was friendly. At the same time it was well understood by both governments that the immediate cause of her being stationed at Havana was the recent occurrence of riots in the city and the desire of this government to be in a position to safeguard the rights and property of its own citizens in case of any violent demonstrations. Our ship was anchored in the middle of the harbor abreast of the city wharves, and at no great distance were the Ward Line steamer "City of Washington" and the Spanish warship "Alphonso XII."

The city of Havana is located on the shores of a capacious landlocked harbor whose contracted entrance is guarded by the at once famous and infamous Moro Castle on one side and by the Punta Castle on the other. The former has figured largely in the present war, and the accompanying illustrations of Havana and its noted fortress will have a special interest at the present juncture. The historic cathedral shown in another engraving is already well known to Americans for its association with the name of Columbus. It will henceforth take

on an added and painful interest as having witnessed the funeral services of our sailors and marines who have died in the service of their country by an untimely but none the less meritorious death.

On the evening of Tuesday, February 15, after the

rain of missiles of all descriptions, from huge pieces of cement to blocks of wood, steel railings, fragments of gratings, and all the debris that would be detachable in an explosion.

"I was struck on the head by a piece of cement and knocked down; but I was not hurt, and got to my feet in a moment. Lieut. Hood had run to the poop; and I supposed, as I followed, he was dazed by the shock and about to jump overboard. I hailed him, and he answered that he had run to the poop to help lower the boats.

"When I got there, though scarcely a minute could have elapsed, I had to wade in water to my knees, and almost instantly the quarter deck was a wash. On the poop I found Capt. Sigsbee as cool as if at a ball, and soon all the officers, except Jenkins and Merritt, joined us. The poop was above water after the "Maine" settled to the bottom. Capt. Sigsbee ordered the launch and gig lowered, and the officers and men, who by this time had assembled, got the boats out and rescued a number in the water. Capt. Sigsbee ordered Lieut.-Commander Wainwright forward to see the extent of the damage, and if anything could be done to rescue those forward or to extinguish the flames, which followed close upon

the explosion and burned fiercely as long as there were any combustibles above water to feed them.

"Lieut.-Commander Wainwright, on his return, reported the total and awful character of the calamity, and Capt. Sigsbee gave the last sad order, 'Abandon ship!' to men overwhelmed with grief, indeed, but calm and apparently unexcited."

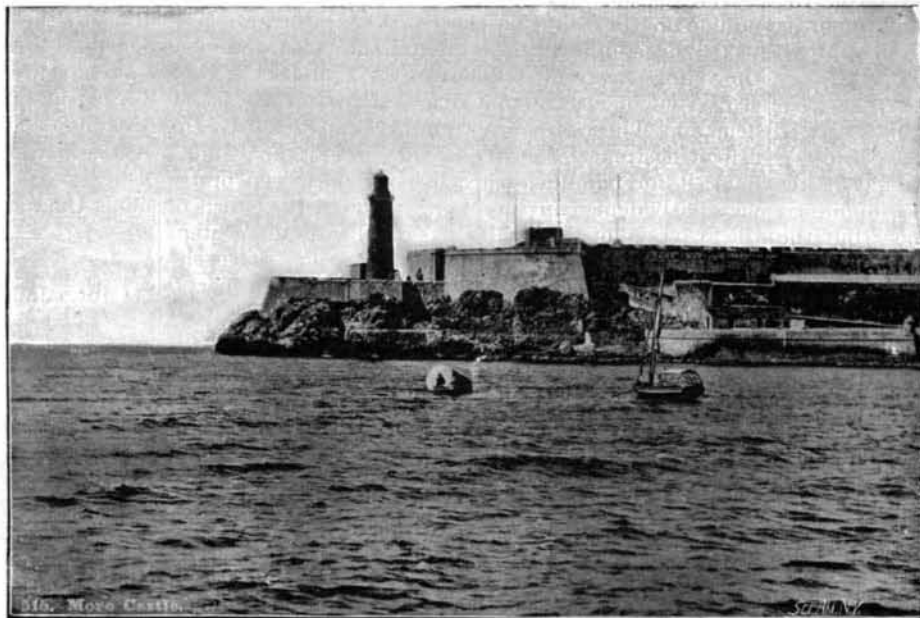
We publish an exterior view and a longitudinal

section of the "Maine," which fully explains the frightful fatality among the crew. The terrific force of the explosion renders it almost certain that it was the forward magazines which exploded. There were two of these—the forward one, containing the ammunition for the 6-inch guns, being situated about 50 feet from the bow, that containing the 10-inch gun ammunition

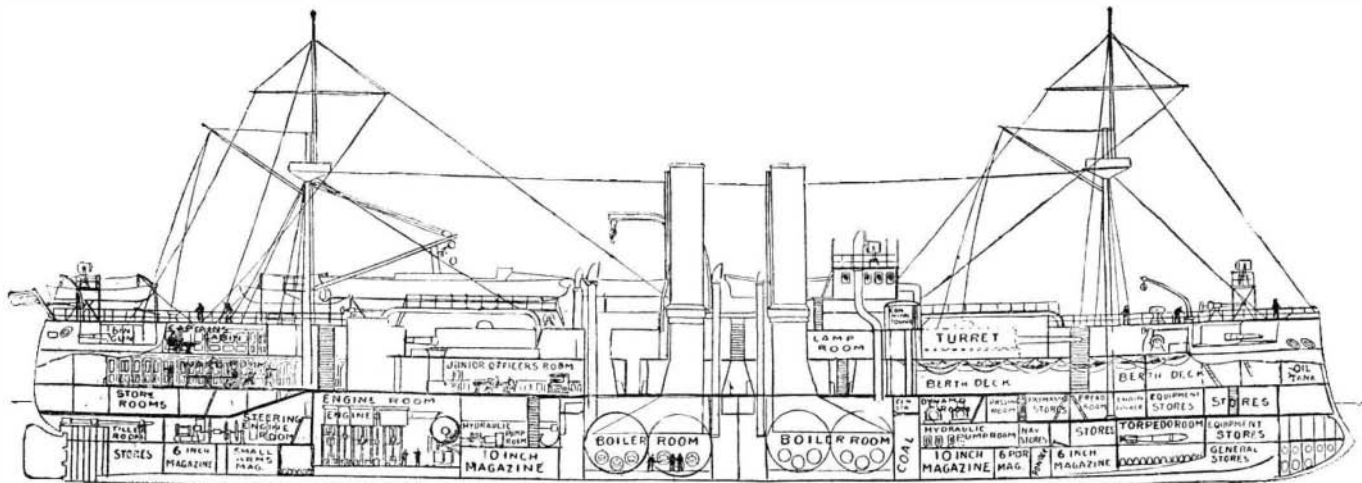
being situated further aft, at about 90 feet from the bow; between them was stored black powder and smaller ammunition. The combined weight of the explosives in these compartments was no less than thirty tons! By reference to the engravings it will be seen that, slung in their hammocks above this sleeping volcano, on what is known as the berth deck, were the crew, and it is a mournful consolation to realize that the killed probably knew nothing of the pangs of death—so terrific must have been the blast.

According to the testimony of a passenger upon the "City of Washington," there were two distinct explosions, the interval between them being sufficient to give him time to run up on deck and witness the falling debris of the wreck. The ship took fire at once, and was so badly shattered and went down so swiftly that some of the survivors had barely time to climb through the hatchways and escape being drowned between decks. Boats were immediately lowered from the "City of Washington" and from the Spanish cruiser, and these succeeded in picking up a large number of the survivors. A dramatic incident occurred when an officer of the "Maine," in one of the rescuing boats, called out: "If there is any one living on board, for God's sake say so!" The only answer was an echo from the distant shore, which repeated "for God's sake."

The disaster has produced a profound sensation throughout the world, and expressions of deep sympathy have appeared in the press and have poured in upon our government from all the governments of the civilized world. The dignified self-restraint of the American people in the presence of such a trying climax has won universal approval, and it is being realized that for the present at least we must follow the suggestion



MORO CASTLE AT THE ENTRANCE TO HAVANA HARBOR.



LONGITUDINAL SECTION THROUGH BATTLESHIP "MAINE."

usual inspection of the ship had been made, and the crew had swung into their hammocks for the night, suddenly, and without the least preliminary warning, the "Maine" was torn open by an explosion which sent her to the bottom and killed, according to present reports, 253 out of her complement of 354 officers and men. The fatalities were confined almost entirely to the crew, only two of the officers being included in the list of dead

or missing; and this is accounted for by the fact that the explosion occurred in the forward half of the ship, where most of the men were berthed—the officers' quarters being at the after end of the ship. Lieut. Blandin gives a graphic account of the disaster, from which we quote:

"Scarcely had I spoken when there came a dull, sul-



HAVANA CATHEDRAL.

len roar. Would to God that I could blot out the sound and the scenes that followed! Then came a sharp explosion; some say numerous detonations. I remember only one. It seemed to me that the sound came from the port side forward. Then came a perfect

perfect

contained in the famous telegram of Captain Sigsbee, of the ill-fated ship, and "suspend judgment."

A board of inquiry, consisting of Captain Sampson, Captain Chadwick, Lieutenant-Commander Schroeder and Lieutenant-Commander Marix has been appointed, and will conduct an exhaustive examination of the survivors and of the wreck itself. Until its report is made it will be impossible to determine, even approximately, the cause of the disaster.

Breeding Fish by the Million.

BY GEORGE ETHELBERT WALSH.

The grand fiasco of the sealing question is an unpleasant reminder of the uncertainty of all wild animal life on the globe unless protected by science; but the apparently abortive efforts to save the seals by international agreement are partly offset by a general movement to establish an International Fishery Association. The United States government has issued invitations to the governments of all the European countries and to those of China, Japan, Mexico, Brazil and Venezuela to confer with the United States Fish Commission for the purpose of co-operating in protecting and propagating the fishes of the seas, gulfs and oceans.

It is with commendable pride that the United States Fish Commission takes the initial step in the direction of elevating all questions affecting the food supplies of the ocean from the arena of politics and international disputes into the realm of science. That such questions should never have been a matter of politics no one with a knowledge of the subject disputes. If further proof were needed, however, it would only be necessary to glance over the work of the United States Fish Commission, and of the various State commissions, to see what can be accomplished in this direction in the name of science, when not handicapped by political "pulls" and "deals." The work of increasing the food supply of the seas, rivers and lakes of the country is pursued so quietly, and with so little ostentatious display, that very few realize its importance or the far-reaching results.

In the earliest times the food fish of the water formed a valuable source of sustenance for a large percentage of the population, and an increasing industry was built up as new methods for harvesting and preparing the fish were devised. The simple savages contented themselves with spearing and snaring the finny members of the rivers, lakes and seas; but, as population increased, and the cunning of man in overcoming his environments developed, the fish hook and the seine were brought into more perfect use. The consumption of fish increased with the advent of new methods for catching and preserving them. Early in the present century many of our most important species of food fishes were threatened with extinction. Like our song birds and game birds, laws had to be enacted to limit the destruction; but these were considered inadequate in view of the just demand that a large class of fishermen, who depended upon the fisheries for a living, had to be supported by catching the products of the water without undue molestation.

The problem threatened to become a serious one in this country, where thousands of fishermen made their living in this industry, and either they would have to be restricted in the exercise of their past privileges so that their earnings would be cut down one-half, or they would have to be left alone until they destroyed all of the fish of the sea and were left without any visible means of making a livelihood. In either case considerable suffering would have resulted. Fortunately for all concerned, science came to the rescue about this time, before it was too late, and under its guidance our fisheries, instead of deteriorating, have suddenly expanded and developed into one of the most important industries of the North American continent.

We are not entirely out of the woods yet, as some of our food fishes are almost on the verge of complete extinction; but the promises of artificial propagation are so satisfactory and flattering that one feels sure that the end is not yet. At first it was thought that all a fish commission could do was to restock lakes and rivers with young fry, and to remove the worst enemies from the vicinity; but this to-day would be considered a very small and unimportant part of the duties of the national or State commission. The chief work that is performed by the State hatcheries is the propagation of millions of fish under conditions that make the percentage of deaths small and insignificant. It is well known now that of the millions of eggs of food fishes deposited in the sea, rivers and lakes, the greater part are eaten or otherwise destroyed. Consequently, the multiplication of the most valuable food fishes by natural methods does not begin to keep pace with the demand for them.

But in the State hatcheries the percentage of fertile eggs that are hatched out is large, and nearly all of the young fry escape the ordinary dangers that prevail in their natural habitat. There are no voracious creatures to pursue and devour them when first released from their shells, and they grow and thrive under conditions peculiarly adapted to their requirements. Almost all kinds of food fishes are now increased by artificial propagation, and those that cannot be hatched

artificially are protected and indirectly benefited by wise laws. Special investigations are being made to-day of certain species of fishes which are threatened with extinction, and methods will be adopted to check their diminution in numbers.

Oysters, for instance, cannot be hatched out by the million in the State hatcheries; but they can be protected by stopping the indiscriminate destruction of the young ones, and this enables them, under the modern system of culture, to increase almost as fast as the demand. The right of a single person to destroy the fish of a stream of water by poisoning it, or by damming it for manufacturing purposes, has been pretty vigorously denied in the courts through the efforts of the Fish Commission, which has in all cases taken steps to stop such a nuisance. The fish in their native element are considered public and not private property, and it is in the interest of the community at large that they are protected and their numbers increased. This principle of the United States Fish Commission is now generally recognized as a just and sound one; but when it was first announced, vigorous opposition was met on all sides by selfish or ignorant people.

The protection of the lobsters on the New England coast was bitterly opposed by the old fishermen, who thought it an infringement upon their personal rights to stop them from catching these crustaceans at any season of the year they pleased, as they had been in the habit of doing in the past. The laws, in many cases, had to be enforced at the point of the shot gun, as the oyster navy of Maryland is compelled to do at times even to-day. But time has had an opportunity to change the lobstermen's hatred into surprised gratefulness. The lobster hatcheries at Gloucester and Wood's Holl have turned loose thousands of young crustaceans annually for several years now, and these have gladdened the hearts of the fishermen. The industry is improving so rapidly under the protection of the State laws, and the annual restocking of the waters, that as much money can now be made in the lobster season as one formerly could make in the whole twelve months. Moreover, the fishermen now of their own accord throw back into the water all lobsters under eight or ten inches long. One female lobster will yield from ten thousand to seventy-five thousand eggs in one season; but probably not more than half of one per cent of these will ever hatch and reach maturity in the water. Other lobsters, parasites, disease and fish-eating inhabitants of all kinds destroy these eggs and the young lobsters by the thousand, and their multiplication is very slow. But in the fish hatcheries the eggs are protected from all enemies, and the young lobsters are not turned loose until they have attained a size which enables them to care for themselves.

The Fish Commission has been so successful in restoring the lobster industry to its former normal condition that efforts are now being directed toward the poor terrapins—a delicious luxury that is rapidly disappearing. Unless the terrapin industry can be protected by law, and the creatures multiplied by artificial propagation, we will soon have to strike one of our favorite dishes from our future menus. At present it is difficult to get any but very small terrapins, so closely and vigorously are they killed off every season.

When we come to consider the success of shad, salmon and trout propagation, we begin to realize more definitely the value of the national and State fish commissions. Our rivers have been restocked with shad and salmon until they seem to be literally choked with them in the running season. During the past year ninety-three million young shad fry were turned loose into the rivers flowing into the Atlantic Ocean and Gulf of Mexico. Efforts are now being made to introduce the Pacific coast salmon in our Eastern waters, and some five million eggs have been sent to stations in New York and the New England States. The young fry will be liberated in the Hudson, Susquehanna, Merrimac, Kennebec and Penobscot Rivers. If they prove successful in their new homes, our streams of water will greatly increase the food supply of the country, and both consumers and fishermen will be benefited by the process. An important branch of the work carried on by the Fish Commission is exchanging fish fry in different parts of the country, and the State commissions are prosecuting this work energetically also. A more even distribution of the food fish will thus be accomplished at little expense. Before the shad hatcheries were established on the Hudson and Connecticut, this valuable fish was beginning to grow exceedingly scarce in all the Atlantic coast rivers; but there is an abundance of the fish each spring now.

All of the old trout streams and lakes have been made valuable again by the artificial propagation of this gamy fish. Originally many of our streams and ponds were full of trout, and the early fishermen would often take a thousand pounds a year from one small stream; but the steady destruction of them depleted their numbers so that few could be found when needed. Then came the establishment of the trout hatchery on the Caledonia Creek in New York State, under the control of the State fish commission, and with Seth Green, the pioneer in the industry, as superintendent. From this small experimental station the work grew, until it

is worth many thousands of dollars to the people of the State to-day.

The State commissions co-operate with the national Fish Commission; but their particular fields of operation are so well defined that they do not conflict. The United States Fish Commission devotes most of its time to the restocking of streams that pass through several States, and to the multiplication of the principal sea fishes. Besides liberating the enormous number of shad fry last year, the commission turned loose 98,000,000 young lobsters and about 24,000,000 mackerel. Altogether it hatched 885,000,000 eggs of valuable food fishes and turned the young fry loose in the waters along the coasts of our country.

Science Notes.

Capt. James Brown, commander of the "Windward," lately presented to Lieut. Peary by Mr. Harnsworth, has spent thirty-nine years and made thirty voyages in Arctic waters. His father and grandfather were engaged in Arctic work before him.

At a meeting of the American Geographical Society at Chickering Hall, February 14, Alfred G. Harnsworth, of London, who lent his ship "Windward" to Explorer Peary was elected an honorary member. Cosmos Mindeleff, of the Ethnological Bureau of the Smithsonian Institution at Washington, delivered a lecture on the origin of the cliff dwellings in the Southwest.

"La Fronde," a daily political and literary journal, edited, managed, set up and printed by women, has made its appearance in Paris, price one sou. Mme. Marie Durand, late of the Théâtre Français, is the founder; Mmes. Séverine and Pognon write the editorials, Mme. Dieulafoy archaeological articles, and Mlle. Chauvin, doctor of laws, whose application for admission to the bar was recently rejected, covers the law courts. Of the first edition 225,000 copies were printed.

Investigations have recently been made as to the number of cabinet officers who were college graduates. Out of 262, 178 or more than two-thirds have been college graduates. Of this number, Princeton had 22 representatives; Yale and Harvard, 21 each; William and Mary, 10; Dickinson, 9; University of North Carolina, 8; Dartmouth, 7; West Point, Drew and the University of Pennsylvania, 5 each; Universities of Virginia and Brown, 4 each. Three other institutions have 3 each; eight are represented by 2 each, and three by 1 each.

The Edward P. Allis Company has received from Seth Low, President of Columbia University, New York, his acceptance of an offer by the company to equip a steam laboratory in the Department of Engineering in the university. The laboratory is to be known for all time as the Edward P. Allis Memorial. The gift of the Allis company consists of a model triple-expansion Corliss engine, as perfect a piece of machinery as it is possible to turn out, and an air compressor. The two are worth \$150,000. The engine will be run at the university merely to illustrate its mechanism for the benefit of the students.

To France belongs the merit of having laid the foundations of the systematic study of ancient volcanoes, says Sir Archibald Geikie. As far back as the year 1752, Guettard recognized that the Puys of Auvergne were volcanic cones that had poured forth streams of lava. But it was reserved for Desmarest twelve years later to examine the question in detail, and to establish the investigation of former volcanic action upon a broad and firm basis of careful observation and sagacious inference. He discovered that the volcanoes of central France were not all of one age, but had made their appearance in a long series, whereof the individual members became less perfect and distinct in proportion to their antiquity. While these fruitful researches were in progress in France, others of hardly less moment were advancing in Scotland. Hutton, as a part of his immortal "Theory of the Earth," had conceived the idea that much molten material had been injected from below into the terrestrial crust, and he had found many proofs of such intrusion among the rocks of his native country. His observations, confirmed and extended by Playfair and Hall, and subsequently by Macculloch, opened up the investigation of the subterranean phases of ancient volcanic action.

The Current Supplement.

The current number of the SUPPLEMENT, No. 1156, contains a number of articles of interest. Technology is represented by articles on "The Artificial Silk Industry" and "Gutta Percha—Its Properties and Uses." "An Improved Sunshine Recorder" and "The Magnetic Properties and Electrical Resistance of Iron at a High Temperature" are important articles in meteorology and electricity. Natural history is represented by an article on "Hibernation" and a paper by Dr. George Archie Stockwell on "A Humbug—Art versus Nature," describing some of the curious composite sea monsters for which we are indebted to Japanese artists who prepare "mermaids" for the market.