NAVAL EXPERTS ALL FOR SKELETON MASTS

Old-Style Structures for Use of Range Finders Have Been Proved by Severe Tests to Be Untrustworthy During Battle.

New Mast, Simply a Spiral Mesh of Steel, Remained Standing on Monitor Florida Although Cut in Many Places by Shells.

WASHINGTON.— Tremendous sums are annually expended in target practice by the navy of this nation. The ultimate end sought for in this sedulous training and costly expenditure is the acquiring of an ability to hit the enemy first, to hit rapidly, and to hit hard.

It is now realized that the sea fights of the future will open at extremely long ranges, say five or six miles. "The fleet that first gets the range," says Rear Admiral Evans in a recent interview, "and is best handled after the range is obtained, will undoubtedly do such damage in the first ten minutes as practically to disable the opposing fleet."

All other things being equal, the initial advantage would therefore appear to be the deciding one. The gaining of this advantage is now almost wholly dependent upon the observers stationed in the tops, the clear-eyed, cool-headed men who from their point of vantage determine the range, and by the various systems of fire control communicate it to the men behind the guns. With these salient points in mind, the reader can clearly comprehend the vast importance of an observing station sufficiently elevated for the range finders to execute their mission with precision and celerity, more important still, a station that can remain longest erect under the stress of battle.

Old-Style Mast Obsolete.

In a recent notable test which was conducted by the British admiralty, it was found that the ordinary cylindrical steel mast with which all battleships are now fitted is wholly unfitted for this purpose. The Hero, an obsolete battleship of the second class, was selected for the experiment. A complete system of fire control was installed in the old warrior, and then the vessel was anchored over a shoal and attacked by the guns of the modern first-class battleships Hibernia and Dominion.

Although the deductions of the admiralty officials have been withheld, a writer for a service journal (The Navy) has ascertained that the effect of the gun fire upon every part of the fire-control system, located above the protective deck, was disastrous. A six-inch shell burst in the improvised fire-control top on the mast and carried away the range-finding station in the very beginning of the simulated combat. Most significant and important of all, a splinter of shell—not a direct hit—went through the mast, and although the mast stood, every one of its fire-control wires was severed. Thus was the most important problem solved in the first two minutes.

Changed Conditions in Shooting.

Then was asked the question whether the modern system of fire control, with its most important installation in a cylindrical steel mast and its observatory placed at a high elevation upon that mast, could withstand for any length of time the fire of a straight-shooting foe. It was realized at once that it could not—that with the increased range and deadly precision of modern high-powered guns not only masts but smokestacks and other super-deck attachments are more than likely to be shot away at the very beginning of the battle.

This brought naval administrations face to face with new conditions. The need of some method of carrying range finders high in air had been noted in the battle of the Tsushima straits, where the initial advantage had been gained by the Japanese, who had concentrated their fire upon the Souvaroff, Rojestvensky's flagship. According to Semenoff, a Russian naval observer on board the flagship, the mast of that vessel was shot away almost at the beginning of the action. This not only interrupted all further efforts on the part of that vessel to get the range of her antagonists from her fighting tops, but it also interfered with the display of signals.

The need of some new method indicated by that battle was accentuated and made urgent by the test to which the Hero was subjected. Some of our own very alert and progressive navy officers at once set about solving the problem. The result was the test to which the monitor Florida was subjected a few days ago. The Arkansas, a sister ship, was selected to do the firing.

The Florida is one of the new type of single-turret monitors. For the purposes of the test she was towed to the Thimble Light Shoal, off Old Point Comfort, and anchored about midway between Cape Charles and Cape Henry. The Arkansas took a position about 350 yards westward, so that the shots, after passing through the Florida's military mast, would fall into the open sea. The shots were fired at a range of about 350 yards with a reduced charge, so that the effect was practically the same as a range of 5,000 yards with a full charge of powder.

The mast is described as a mesh of steel, 96 feet in height, and carried near the stern of the monitor. It was built upon a double spiral principle, each set of spiral columns running in an opposite direction. At the top was a platform upon which were two dummies weighted and wired for recording the shock of the projectile. The steel rods which form the mast are two inches in diameter at the base, narrowing at the top. The experts who had designed it had employed all of their mechanical skill to construct a framework that would still remain erect though pierced by many shot.

Strength and Lightness Needed.

It was necessary to reconcile two conditions. The steel skeleton must be of great strength, and yet its parts must be so light that the impact of a shell cutting through the latticelike frame would not receive enough resistance to explode it. Modern shells, particularly those of the smaller caliber, are fitted with a percussion fuse so sensitive that the resistance offered by the crest of a very small wave is sufficient to explode it. And one of these bursting in the framework would be more than likely to tear the structure to pieces and bring it crippling to the deck, observers, range finders and all.

The mast was subjected to a thorough test and emerged successfully. The first shot, a four-inch projectile, cut one of the steel rods. The second cut several more rods, but did not injure its stability. A twelve-inch projectile likewise did very little damage. When five shots had been fired at the mast Lieut. Richard D. White and Lieut. Commander George Bradshaw, assistant inspector of the target practice, climbed to the platform at the top of the mast and shook it with all their strength, but still the mast stood firm.

Coolness and Nerve Required.

If any post ever requires coolness and iron nerve, one would think that it would be required by the men who take station in one of these structures when an enemy has been sighted and when battle is soon to be joined. In his admirable essay on "Courage and Prudence," published by the Naval institute, Capt. B. A. Fiske says that "whatever method of observation from aloft be employed, it is evident that, even supposing the shots to group as well as at target practice, the work of the observers aloft will be of the most delicate kind. It is difficult to realize any job that could be given to mortal man, not excluding that of the admiral or captain, requiring such absolute presence of mind, and such persistent concentration, as that needed of every member of the fire-control party.

"Any member of a gun's crew, in fact anybody else in the ship, can get some relief by physical exertion of some sort; or, if he be a gun pointer, can press his button and feel his gun fire. But every member of the party aloft must do nothing but use his brains, with a little assistance from his eyes. The most perfect self-forgetfulness will be required of everyone. No one must be diverted by any accidents happening to his own ship, or by anything going on in the panorama before him; and such things as shrapnel and high explosive shells bursting near by, and the foremast going overboard, he must utterly ignore."

How New System Works.

Capt. Fiske is widely known as the inventor of the range finder which bears his name. The present system is one by which a group of observers stationed aloft note the relation of the splash of the shot to the water line of the target and endeavor to correct any errors in sighting. They watch the fall of the shots through powerful glasses, and according to the place where the shot strikes a change in range is ordered to the gunners, until the shots hit the target. Usually the third shot gives the right range.

Two important differences between target practice and battle are noted by Capt. Fiske: One is that the sea at target practice is always smooth; the other that the target does not hit back. "It may be pointed out in objection," he says, "that target practice must be held in smooth water, because competition among the gun pointers is essential to success, and competition can be had only when the conditions are identically the same for all, which is only when the water is smooth. It may be objected also that it would be impracticable at target practice to have a target that would hit back in the way the enemy would in action."

Should See Effect of Fire.

This authority maintains, however, that it should be easier to get on to the target in battle than at target practice, because at target practice a shell striking the canvas of a target—say 6,000 yards away—cannot as a rule be seen; while a shell exploding against the side of a ship gives out a brilliant flame.

"Shells that do not explode cannot usually be seen; but it may be suggested here that, in the case of armor-piercing shell, it might not be difficult to fit a sort of dummy fuse in the nose of the shell which would explode upon impact and give out flame. Such a contrivance, if found practicable, would assist very much in fire control; because, after all, we are very much more interested in the shots that hit than in the shots that miss. Furthermore, among the shots that miss, the only ones of which we can take account are the shots that go short; and the amount by which they go short is very difficult to estimate, whereas the shots that hit are absolutely located. Furthermore, if we count the shots that hit, this does not prevent us from counting the shots that go short; which gives us, by an easy method, the number of shots that go over. The adoption of a device, therefore, showing us positively when a shot hits, would be a means of getting all the data needed for correcting the range finders and getting the sight-bar ranges."

Asserting that there is no perfect range finder, this officer asks what would there be impracticable, in the early stages of the battle, in having an observer, as high aloft as possible, handling no mechanism except a pair of binoculars and a telephone, in telephoning down to the communication room information as to the effect of each shot, until all the gun pointers in the turrets had gotten on to the target and had set their range finders at the correct sight-bar range? After that he could come down—probably.

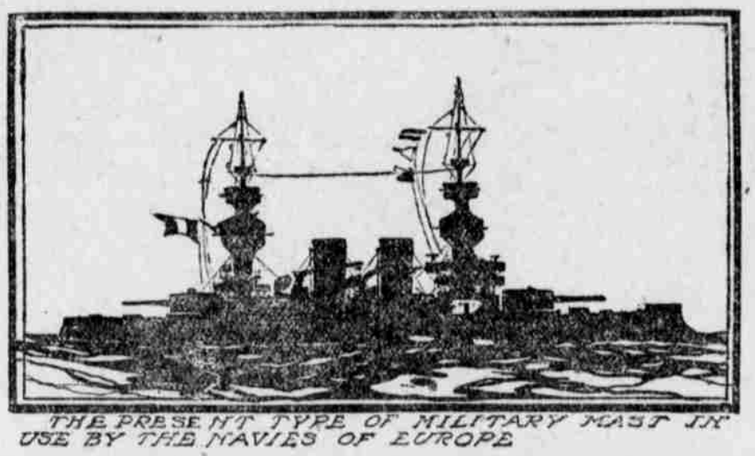
Experiments with Crinoline Nets.

The experiments to determine the possible usefulness of crinoline nets against torpedo-boat attacks have not yet been undertaken. It is difficult to see how these can fail to harm the underwater section of the monitor, but assurance is given that they will be conducted in such a way as not to injure the hull. The test which involved the turret and its mechanism inflicted no great injury, owing to the reduced charges which were used in the 12-inch guns of the monitor which did the firing. In fact, complains one critic: "What is called in some quarters the 'shooting up' of the monitor Florida appears to have been a gingerly graduated experiment to prove that her turret armament was shell-proof and her system of fire control invulnerable."

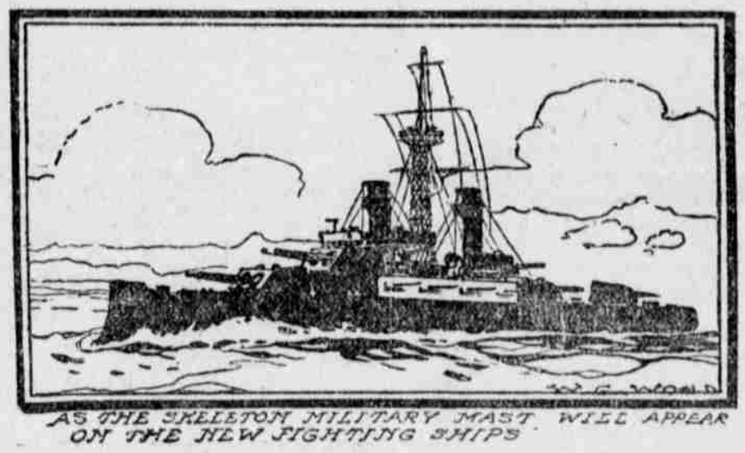
This was vastly different from the ordeal to which the British Hero was subjected. One witness of the experiment says: "The first six shots were all misses, and although sparks began to fly from the Hero as soon as the range was found, the shooting was by no means up to the level of battle practice, notwithstanding that the weather conditions were absolutely perfect—a calm, clear day, with the sun behind the firing ships. Very soon the Hero was in the middle of a dense cloud of smoke, through which, now and again, flashed great tongues of fire, as shell after shell struck the helpless old warrior. It was soon over, however, and save for a slight list to port there was nothing to show, at a distance, the ordeal through which she had passed. The funnel and mast both stood, and very little smoke issued from the interior, but a closer inspection revealed the full extent of the damage. The upper deck had been blown up by the explosion of a heavy shell underneath it, after the conning tower had been penetrated, and one of the lay figures had daylight through his chest. Altogether 28 hits had been scored out of 130 rounds."

The United Service Gazette in its comment said that "here was a ship fitted with fire-control apparatus whose maintenance is absolutely essential during battle, and here were ships which hit their target once in every four rounds; and the whole fire control system had been reduced to impotence in two minutes."

Our own experimenters, however, seem satisfied with the Florida test, and officially announce that it was "satisfactory."—N. Y. Times.

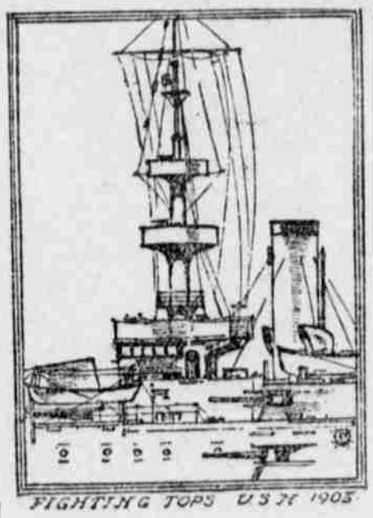


THE PRESENT TYPE OF MILITARY MAST IN USE BY THE NAVIES OF EUROPE



AS THE SKELETON MILITARY MAST WILL APPEAR ON THE NEW FIGHTING SHIPS

THE FIRST FIGHTING TOP



FIGHTING TOPS U.S.N. 1905

DIDN'T LOOK LIKE SHOE HORN.

But What Does Mere Man Know About Mysteries of Feminine Toilet.

Hugh Jennings and his Detroit Tigers were entertained at a dinner in New York last month, and in the course of his address of acknowledgment Mr. Jennings said:

"Our enemy's mortification brings back Cornell to me. The Cornell team played at the seashore one June, and after the game we took a bath.

"There was a lady in a nearby bathhouse, and she had a little dog with her. After a bit the dog came running out of her bathhouse with a bunch of curly golden hair in its mouth. It tore up and down the long aisle worrying that glittering bunch of curls, shaking it and growling at it as if it had been a cat. A funny sight to see.

"There was, naturally, a good deal of laughter. Then the lady was heard calling the attendant in a distressed voice.

"'Oh,' she called, 'would you please fetch my little dog back to me? He has run off with something of mine, and I can't get my shoes on without it.'

"The attendant was one of those fresh chaps. He yelled back at the lady very loud:

"'Yes'm, yer little dog's out here, all right, havin' a spree with somethin' or other; but from the look of it I wouldn't say it was a shoe horn.'"

Historical Find at Yale.

After lying hidden in a small closet at the Yale Divinity school for years, an interesting lot of manuscript sermons of Presidents Daggett and Clapp of Yale, delivered between 1741 and 1760, have been brought to light. While the small closet which is part of the bookroom at the school was being cleaned out recently, a cardboard box was discovered, and in it a number of old books, papers, and packages were found. The sermons have grown brown with age, and the ink has faded, but they are easily decipherable. The sermons, with the books and other papers, will be placed in the university library.

THE WRONG STREET

By ANSELM CHOMEL

Broadhurst had met the young woman but once, and then by the merest chance. He had done her some little service and been rewarded with a smile and gracious thanks. With that he had dismissed the matter from his mind. A friend had happened on the scene in time to present him; the young woman had said it was a pity that he should have been put to so much trouble on her account, and he had recited a foolish speech—he had read it in a French novel—to the effect that any man should consider it an honor to be her slave.

He had certainly not gone out of his way to met her, nor tried to extend the acquaintance beyond the first meeting. And as for his foolish speech, it was preposterous to torture it into an offer of marriage. But there was her letter, and there was no mistaking its meaning.

"A mistake of the postman, of course," he thought at first, but the address on the envelope, "Mr. Richard Broadhurst, 54 George street," settled that point against him.

The letter made it clear, provokingly clear, that Miss Virginia Hamilton looked upon him as a suitor, and that she was graciously yielding to his entreaties.

"Why one would think from this," he said, "that I had thrown myself at her feet and begged her to be my wife, when, confound her, I wouldn't—but what's the use of storming around about it? I must get this matter straightened out."

For Richard Broadhurst was the last man on earth who was thinking of marriage.

But, after all, why not? The boldness of the thought both startled and amused him. It came back. Why not? He could not answer the question, although he called up all his old-time prejudices and all the arguments which to him had seemeed to prove conclusively that he should never marry.

He remembered that Miss Virginia was not bad to look upon, that she gave evidences of refinement, and that her manner was pleasing. True, he had noticed a certain haughtiness in her bearing, but that, he thought, would be for the world and not for the man she loved. His old ideas about marriage might be all right so far as the rest of the women in the world was concerned, but Miss Virginia—well, that was another matter. A wife, after all—if Miss Virginia were the wife—might not be the worst thing in the world.

After accepting his offer of marriage—which he had not made—Miss Virginia had written that she would remain with her aunt in New York till a week before the wedding, the date of which, he learned from her letter, was three months hence.

'I suppose," she had written, "that you will call upon your old friend Mr. Gay to act as groomsman. "Mr. Gay was the friend who had introduced them.

"Evidently," Broadhurst laughed, "there isn't much for the modern groom to do but to appear at the right time and put his neck into the yoke. The bride-to-be picks out the groom, hints at whom she would like to be 'best man,' names the place and date of the wedding, and looks after things generally. But for the fact that there couldn't very well be a wedding without a groom, I suppose they would eliminate him. But I'll let Miss Virginia manage this little affair."

Then he notified his friend Gay that, being inexperienced in such matters, he was going to put himself into Gay's hands, and asked him to look after such little details as his bride-to-be had not thought to arrange.

He was in a fever of excitement till Gay's answer came, but it reassured him. It was as follows:

"Old hand at the business, and will see you through it. Congratulate you on the bride you are to get. Now, old man, keep cool and don't get excited. Above all, don't do foolish things. Just buy your wedding clothes, be sure to get here on time, and don't worry about anything else. I will attend to all little details."

"Really, he's an accommodating fellow," Broadhurst thought, "but I should like to have something to say in this matter. The groom seems to be almost as unimportant a factor in a wedding as an unpreferred creditor where the assets are ten cents on the dollar."

Then followed three months of ecstasy, intermixed at times, it is true, with the fear that something might dash the cup of newly-found bliss from his lips.

The weeks passed without Broadhurst hearing again from Gay or from Miss Virginia. A week before the date of the wedding, he thought that perhaps he ought to go over and see them, but feared to intrude. They were busy, no doubt, with the arrangements, and would not care to be bothered by one who was to play the minor part of groom. So, impatient though he was, he concluded to await his cue before appearing on the scene. Then, there were his own arrangements to look after. For the fiftieth time he received the solemn assurance of his tailor that his wedding clothes were perfect.

Finally, his wedding day arrived, and he was at the railroad station two hours before the time for the train to leave. Once on the train, he took a seat, but soon left it, to find the conductor and ask him when he would reach his destination. True, he had been consulting the time-table for days, but now feared that he might have made a mistake in reading it; and then it might be necessary to send a message asking them to delay the ceremony until he could arrive. His fears on this point quieted, he again took his seat, but it occurred to him that the locomotive might be in a bad way and cause the train to lose time. But the conductor said the locomotive was never in better condition.

Half way between his home and that of Miss Virginia the train stopped. He rushed out of the coach with a hundred questions on his tongue. What

He Rushed Out of the Coach with a Hundred Questions.

had caused the delay? Would it be a long one? Was there a telegraph office near?

His worst fears were realized. Something had gone wrong with a freight train, and the way was blocked. It was several miles to the nearest telegraph office.

The wedding was set for eight o'clock that evening, and it was ten minutes past nine when Broadhurst leaped from a cab in front of Miss Virginia's home, turned to pay the driver of the foaming horses and ran up the steps of the house. His ring was answered immediately, and he almost rushed into the arms of his friend Gay. He thought his friend seemed somewhat surprised at his arrival.

"I hope I am not so very late?" he gasped.

"The ceremony is over," Gay said, "but you are in time to offer your congratulations. Come this way."

The bride came forward and gave her hand. Broadhurst thought she might receive her future husband with a little more cordiality than her manner indicated. To relieve the embarrassment of the situation, he ventured to extend his congratulations, and was glad to perceive that it must have been the proper thing to do, since the bride received them most graciously. Then, with the remark, "I want you to meet my husband," she led him towards the gentleman who had been with her when he entered the room.

After he had been presented, his friend Gay remarked to Virginia's husband:

"You have my friend here—whose name, by the way, is the same as your own, Richard Broadhurst—to thank for rescuing your bride, some time ago, when a team of horses threatened to run her down."

Broadhurst did not catch the other's reply; he was dazed. Gay laid his hand upon Broadhurst's shoulder, saying in alarm:

"Dick, you're ill."

"Nothing serious," he replied; "it will soon pass away. If you will excuse me, I will step outside."

"Funny thing," said Gay, speaking to Broadhurst a few days later. "Broadhurst—that's the other fellow, not you," with a laugh—"had been trying to win Miss Hamilton's heart for a year before she consented to marry him. Well, just about the time you met her, she concluded to accept him, and after she got to New York wrote to him to that effect. He did not get the letter, and renewed his pleadings. Again she accepted him. Broadhurst wired to me, asking me to be 'best man,' and I promptly accepted. In a few days, I was surprised to get a letter from him with the same request. I concluded the dear fellow, in his joy, was losing his mind.

"Now, the strange part of it is that Broadhurst protests that he did not receive Miss Hamilton's first letter, and that he communicated but once with me; whereas his wife is positive that she accepted him twice, and I could swear that I promised as often to act as 'best man.'"

"What was your friend's address?" Broadhurst asked.

"No. 54 Georgia street."

Broadhurst said nothing, but meditated upon how easy it would be to make a mistake and write "George" instead of "Georgia."