NAVAL TARGETS COPY ACTUAL WAR CONDITIONS

Training That Has Enabled Gunners of the American Navy to Make Scores of 100 Per Cent

WITH American naval gunners scores of 100 per cent. have ceased to be unusual; but marksmanship in the navy is a rather recent accomplishment. At Santiago 9,000 shots were fired and there were only 123 hits. Then it dawned upon the minds of the naval authorities that ability to hit a fixed target didnot imply ability to hit the target when it was moving rapidly, as a warship in action is likely to do.

Furthermore, while a target may represent the silhouette of a ship it is not a ship. Therefore efforts have been made in the past year to secure real ships against which the fire of a man of war could be directed as it would be in an actual engagement at sea.

The Puritan and the Katahdin, both obsolete and useless as war vessels, were first attacked by various men of war, but they were so inadequate for the purpose that little enlightenment could be derived from the injury wrought on them by modern guns. Last year, setting all sentimental considerations aside, the Navy Department decided to sacrifice a fighting ship, the old battleship Texas, which had done its part in the Spanish-American war and had become famous for its habit of having accidents happen to it. Upon this craft the battleship New Hampshire opened fire at a range of six miles.

To be sure, the policy of using old ships as targets is not new. This has been done many times in France and England. But the conditions under which the sinking of the Texas was accomplished were so novel as to give this experiment remarkable value from a technical and strategic point of view.

The most striking feature of the experiment was the distance at which the firing was done, the range being from five to six and a half miles for the 8 inch and 12 inch guns and from four and a half to five and a half miles for the 7 inch. The accuracy of the fire even at the greatest range was surprising and showed that the new method of finding and holding the target at present in use in the navy is very efficient.

The fire was directed from the top of the military masts, 120 feet above the level of the sea, and the range was found by trial shots and spotting. The officers standing on the lofty fire control platform observed through powerful glasses the splash as the projectile struck the water. If the splash was beyond the target vessel the gun elevation was lowered; when the shot fell short the gun was raised.

The ship had been placed almost in actual fighting condition, even to the point of having steam up and fires under the boilers. Dummies representing the crew had been placed on the several decks and in the various towers. The most significant result was that obtained when a 12 inch shell—presumably containing a charge of high explosive—pierced the conning tower, burst and blew one side of the tower, weighing from fifteen to twenty tons, entirely away, hurling it to the main deck below. The same shot entirely wrecked the bridge. The chart house and navigating bridge were blown completely away and with them must have gone steering wheel, compass, speaking tubes, telegraphic apparatus and every means of navigating the ship. To quote the statement issued by the Secretary of the Navy:

"The New Hampshire placed the shells anywhere she wanted and when the gunners wished to have some hits on the conning tower and the turret armor in order to observe the effect they had no trouble in placing the shots at from ten to twelve thousand yards range at just the point desired.

"A few projectiles were directed agains the masts, so as to show what would happen to the exposed communication systems.

"An inspection of the vessel after the firing showed immense holes which had been ploughed through from one side to the other, many of them being below water and any one or two of them being sufficient to make the vessel a total loss. The armor of this vessel was unable to withstand the impact at the very great range at which we fired and the battleship was a total loss after the first two broadsides were directed at her."

All the officers of the fleet were deeply impressed with the accuracy and the great destructive effect of the projectiles. All the manikins which were placed at the guns to represent the crews were cut to pieces and the fumes and fire left by the passage of high explosive projectiles would have destroyed every living thing on board. The bulkheads in places were like sieves owing to the action of high explosives and all the compartments below were completely riddled.

Instructive as the experiment was it cannot be repeated very frequently. Furthermore in spite of its realism the shelling of the Texas did not represent what would happen in actual warfare. Firing at the Texas was one thing; keeping on the target when the target is moving at a speed of 20 knots or so is a different story.

In this direction the construction of the Norfolk caissons marks a great step in advance. The Norfolk Navy Yard has completed recently the construction of a floating caisson which represents on one side a cruiser and on the other a battleship. Whenever it is desired to find out how a given section of a fighting ship would behave under fire the section is installed in its proper place on the cruiser side or on the battleship side. Then the caisson, which can be taken in tow by a fast ship, is subjected to attack at various ranges with small and big guns. The material loss resulting from such experiments is naturally less important than if, say, the conning tower of a real battleship were shot at by another battleship.

After every single hit the caisson is visited by officers of the line and staff, who take careful observations by photograph, sketch and note book of every detail of the damage inflicted. Each hit has its own story to tell and thus by alternate attack and inspection the authorities of the navy will acquire a store of practical information the like of which has never before been gathered by any navy in the world.

A curious incident which took place in the course of manœuvres in Magdalena Bay almost permitted medical experts to make realistic observations of the effect of high explosives on the human frame. The repair boat had gone to mark the holes in the target after a string of shots had been fired, as it is customary to do, while the ship steamed slowly around past the target out toward the range to fire another string of shots. The crew of the repair launch found that they had left some things that they needed in another boat, which was anchored off at a safe distance from the target raft.

The warrant officer in charge of the repairing crew thoughtlessly ordered the launch to go for the needed articles while he remained on the raft to fix the target. He never considered that those on board the ship would know nothing of his being on the raft. After the gunners had seen the launch move out of range of the shots they naturally assumed that all of the repairing party had gone with it.

The ship came round into range; the firing flag was run up to the fore truck, the speed was increased to ten knots and a short blast was blown on the whistle, the signal to commence firing.

When the man on the raft heard the whistle blow and saw the big red flag flying at the fore truck he realized in an instant his peril. Frantic with fear he leaped to the end of the raft and looked across the water at the steam launch a half a mile away. No help could be expected from it and it was useless to jump into the water as the bay was full of sharks. Then he hit upon an idea. Like a flash his knife was out and the first halyard which held the target up was cut, then the other, and his life was saved; they could not shoot now, for there was nothing to shoot at. All this had happened in five seconds.

It is said that a pointer of an eight inch gun was in the act of squeezing the electric bulb which would have sent 250 pounds of steel flying at the target, when it dropped, and he turned around with a queer look on his face and remarked:

"Why, there's somebody on that raft!"

Glasses were trained on the raft and the excited boatswain was discovered, none too soon.

Another advance in the training of a gunner was made with the adoption of an ingenious attachment which is affixed to the practice gun and simulates the motion of a moving ship.

Good gunnery with the new system and in action depends not only upon the skill of the pointer; it rests upon the speedy team work of the whole crew. The firing pointer has to keep the gun on the target, so has the trainer who swings the gun from right to left; the sight setter must set his sights according to the orders he receives over the telephone from the conning tower. Twelve charges a minute is now the average for the 7 inch gun. It takes thirteen seconds for a 12 inch shell to reach a target at a range of 10,000 yards.

As seven seconds are allowed to the spotters and three seconds to the sight setters, the gun is loaded, primed and fired while the first projectile is still in the air. With the new practice system the gun pointer points his gun as he would under actual fighting conditions. A small card bearing the outline of a ship is attached to the gun and when its bull eye is on the cross wires of the telescope's lens the pressure of the pointer's hand on a firing key releases a hammer which dots the target card and records the accuracy of his aim.

The new system of training pointers and registering their accuracy automatically enables the navy to realize large savings in the shape of ammunition. Some $2,000,000 a year go in smoke from the muzzles of the guns of battleships and the north Atlantic squadron alone spends more at its quarterly practice than was spent during the battle of Manila Bay.

The navy is now studying means to fight airships and aeroplanes. Airships on account of their large bulk and slow speed would be easily destroyed by gunfire. Aeroplanes, small and speedy, present a more arduous problem.

Firing has been done without much success at kites held by ropes attached to vessels. The usual gun seems powerless against aeroplanes. This summer unusually large kites will be used, against which gunners will train a new gun, a one pounder which at an elevation of 85 degrees can throw its projectiles to a height of 18,000 feet.

The German army guards very jealously its secrets, but it is rumored that kites the size of real aeroplanes have been used at manœuvres to test the value of the so-called balloon destroyer. This is a gun mounted on a powerful armored car which throws a projectile weighing nine pounds to a height of 25,000 feet.

In devising novel moving targets for rifle and field artillery practice the Germans have shown a good deal of ingenuity.

Discarding the moving targets which were pulled by horses, capstans or stationary engines, the German army is now using powerful steam traction engines which carry four rope drums able to receive over 8,000 feet of wire rope one-quarter of an inch in diameter. An automatic device insures a smooth winding of the wire rope. The shaft of the drum is driven by two electric motors.

The targets, which are moved forward, backward or sideways at a speed corresponding with the conditions obtaining in real military operations, represent infantry, cavalry and artillery. They are made of some light stuff such as pasteboard and linen and are about the natural size of a man or a vehicle with its horses. They are carried on a sled, the upper frame of which is connected with the lower by hinges so as to permit its being turned around at a moment's notice in case advancing or retreating infantry is to be represented. The approximate speed of the targets is recorded

The latest and most spectacular contrivance for teaching infantry to shoot comes from France. Motion picture films have been taken of cavalry charges with the effect, which in "movies" is so thrilling, of horses galloping right into the auditorium. The screen on which the picture is thrown is not the ordinary rectangular piece of cloth but is unwound from the top roller and wound again on the bottom roller and vice versa, imitating to a certain extent the focal plane shutter in a camera. The cavalry is "stage cavalry," that is, the same group of horsemen gallop in and out and in again and the speed of the moving curtain is so adjusted that the various positions of riders and horses can be accurately recorded.

After every series of shots the light is thrown on and the curtain wound up or down very slowly, enabling each man to realize what the effect of his fire would have been in reality and giving the instructor time to explain the reason of every mistake

It is claimed also that the moving picture target will cure men of the natural nervousness which impairs their marksmanship at such thrilling movments as when they must make a sudden stand against a troup of cavalry charging them at full gallop. At any rate the moving picture is proving popular with the men and affords them a simple and cheap means of relaxation while at work.

Firing Drill by U.S. Soldiers.

French Moving Picture Target.

HEALTH OFFICER TELLS OF SUMMER PRECAUTION THAT SHOULD BE TAKEN IN USE OF FRUIT

By JACOB SCOBEL, M. D.

It is unfortunate that the supply of fruit is greatest and the price the cheapest at that time of the year when its consumption for children is most dangerous. The temptation for parents to give fruit to their children during the warm weather season is increased by the fact that the mild acidity and the large amount of water which fruit contains act in a measure as thirst quenchers.

Fruits are popular articles of diet because of their sweetness and flavor rather than for their nourishing and strengthening properties. In order to understand their effects upon the body it is necessary to know something of their composition. In a general way fresh fruits contain 80 to 90 per cent. water, one-half to one per cent. fat, one-half to one per cent. proteid, 5 to 20 per cent. carbohydrates (starch, sugar and gums), 2 to 10 per cent. cellulose (fibre) and ½ to 6 per cent. of salts, oils, extracts and acids. As the fats and sugars are the heat and power producing elements of food and the proteids the building or waste replacing elements, it is easy to see that the nutritive value of fruits is very low and that what little they possess is due almost entirely to the starch and sugar which they contain.

Unripe fruit is the most dangerous variety. In this state the acid content is high and the sugar content proportionately low. During the process of ripening a series of chemical changes takes place, and with it an increase in the fruit sugar and a relative diminution in the acid. Hence ripe fruit is sweet and unripe fruit sour. The more unripe the fruit the larger the amount of acid and of cellulose or indigestible fibre, the more prolonged and difficult the digestion and the greater the danger of irritation of the stomach and bowels. In the selection of fruits then the indication is to use those which are the least irritating and at the same time the most refreshing, gratifying and nutritious.

Summer is the period when the stomach and bowels of the infant and child are most vulnerable. Owing to the heat and humidity the normal acid juice of the stomach is reduced in quantity and quality and fails to offer the same protection against improper foodstuffs as during the remainder of the year. It is a fundamental rule, in the feeding of children during the heated term, that all food, especially milk, should be reduced in quantity and increased in dilution, because digestion is less active at this time.

Under healthy conditions the acid stomach juice is able to combat the ill effects of many deleterious food products, provided this acid be of the kind which is normal for that organ—hydrochloric acid. Therefore it must be clear that the secret of preventing stomach and bowel troubles in children during the summer lies in establishing and maintaining a healthy condition of the stomach all the year round and particularly at that time.

Few foodstuffs are more capable of producing a fatal attack of summer complaint than fruits. At the same time it is wrong to assume that fruits have no place in the dietary of children, for at the right time and in the proper place they are valuable and wholesome appetizing and stimulating adjuncts. It is the careless and injudicious consumption of fruits of any kind that often paves the way for and incites a fatal attack of summer complaint. Fruits such as oranges, grapefruit, grapes, prunes, apples, pears, peaches, plums, pineapples, berries and bananas contain organic acids which are different from the normal acid stomach juice. The introduction of these acids in excess, either at one time or by frequently repeated quantities, interferes with the quality and therefore with the disease defending properties and action of the stomach juice, and thus allows food either to undergo fermentation or to be acted upon imperfectly and in this way to pass on to the intestines improperly digested.

This process leads to an irritation of the entire intestinal tract, to decomposition and with it to diarrhœal discharges of greater or less severity. Under such conditions the stomach contains an excess of acid and with it comes an irritation of its walls and acid dyspepsia—heartburn, colic, nausea, vomiting, fulness, gas accumulation. All this takes place more quickly if the fruit is unripe, overripe, tainted or decomposed.

No child before the age of six months should be given fruit in any form. From then until the first year children, and above all those artificially fed, should be given the strained juice of an orange or grapefruit, either plain or diluted with a little water to which a pinch of sugar is added. These juices must never be given with the milk, but always one hour before or better one hour after the first morning feeding. Fruit juices if given with milk or shortly before or after its administration upset the stomach and cause vomiting or diarrhœa.

Children who are fed on patent food exclusively are prone to develop infantile scurvy, and in this condition the administration of orange, grapefruit or lemon juice effects a prompt relief and cure. This is brought about by certain changes within the body by which these juices increase the alkalinity of the blood and diminish the acidity of the urine.

In the process of digestion most fruits, especially if unripe, leave an undigested residue, and for that reason, and because of a certain amount of fermentation, they increase the bowel action and thus prevent constipation. An excess of fruit, however, produces the other extreme—an undue amount of bowel action and fermentation and with it that dread and dangerous condition diarrhœa.

From the first to the second year of life apples, baked and skin free, or apple juice, prune juice or stewed prunes without skins may be allowed. The custom of serving these or other fruits with cream or milk is entirely wrong and many attacks of diarrhœa are caused by this combination. The fruit acidity has a baneful effect upon the milk by souring it, and when it is thus taken into the stomach it curdles, ferments rapidly, increases the bowel action, with the inevitable result, vomiting and diarrhœa.

Grapes are especially dangerous for children, not only because of the likelihood of their being swallowed en masse—skin, pulp and seed—but because of their tartaric acid and cream of tartar content which is very laxative and which causes acid, foul smelling and irritating stools.

Children should never be given berries of any kind in the summer—raspberries, strawberries, blackberries, currants, gooseberries, &c. For some reason or other which cannot be explained by any analysis of these fruits, except perhaps the large amount of seeds, children seem peculiarly susceptible to their use, and in the case of strawberries in particular an extensive eruption of hives and a violent attack of pain and diarrhœa are very frequent occurrences.

One great disadvantage under which we labor is that much of the fruit as it is shipped to and reaches us is unripe, and while it is kept in hiding for some time it is usually placed on sale long before it is properly ripened. This applies with special force to the banana and the pineapple. Bananas, which seem so tempting because of their yellow skin, are usually unripe, with a hard indigestible pulp. A banana is hardly fit for consumption until the skin is beginning to turn black and the substance is soft or mushy. In this ripened state the banana is sweet and has much to commend it as a nutritive fruit because of the large percentage of sugar. The pineapple, too, when unripe and green possesses a juice which is sharp, biting and irritating and a body which is indigestible; but when ripe its sugar and aromatic content give it a sweet and delicious flavor and some nutritive value.

Fruits which afford the most nutriment because of the large proportion of sugar are ripe dates, figs, raisins, prunes, grapes and bananas. The most thirst quenching fruits by virtue of their high water content are watermelon, muskmelon, orange, lime and lemon, and the least acid and therefore the least irritating of fruits are ripened bananas, peaches, sweet pears, sweet apples and prunes.

In the summer one of the greatest dangers which threaten the child is summer diarrhœa, and fruits with hard skins, a large amount of coarse fibre or pulp and many seeds are most likely to start the attack. For these reasons the most dangerous summer fruits for children are raw apples, figs, dates, prunes, berries, grapes, bananas, pears, peaches and pineapples. If fruits are given they should be ripe, skin and pit free and cooked or boiled. Indeed, to be on the safe side in the summer the best kind of fruit to give a baby is no fruit at all, particularly if there is the slightest tendency to diarrhœa. If there is a tendency toward constipation the fruit juices, orange, grapefruit or prunes, or apple sauce and skin free stewed prunes will answer every purpose. But as a general proposition during the summer fruits are goodies that are not good for babies.