asked, as the admiral talked over the details of the battle.

"Largely to Providence," he answered. "The escape of the Saikio Maru from the torpedoes, for instance, was a miracle."

"Why did you not use torpedoes against the ironclads? I thought that was the fundamental principle of an attack on armored battleships by weaker vessels."

The admiral winced and hesitated. I had hit him in a tender spot.

"The distance was too great," he said.

Notwithstanding this statement of Admiral Ito, I have already learned on unimpeachable authority that there was not a torpedo in the Japanese fleet. I cannot say who was responsible for this grave omission. It is

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made by the Japanese since the beginning of the war. Had the fleet been provided with torpedoes, it is reasonably certain that one or both of the Chinese ironclads would have been destroyed. The absence of torpedoes is all the more surprising considering the magnificent equipment of the two squadrons in other respects and the admirable way in which they were handled.

The only new idea in modern naval warfare which was thoroughly tested in this engagement was the rapid-fire gun. Admiral Ito said that it played a most important part in the battle.

"Our fleet carried forty-six twelve centimeter rapid fire guns and four fifteen centimeter rapid-fire guns," he said. "Each gun fired about forty shots during the fight, which makes 2,000 shots for the combined batteries, not counting the other guns. The rapid-fire cannon is a splendid weapon, and we were able to embarrass the enemy's gunners. When I learn something of the Chinese killed and wounded, I will compare the figures with the number of shots we fired. The result ought to be very interesting."

"Nothing but our speed enabled us to keep our formation,." "The Chinese were slow, and we kept our squadrons moving so swiftly on the right and left of their line, that they could keep no order of battle. I am convinced that speed is the first thing to be looked for in a warship. I thought so before the battle, and I am now more thoroughly convinced. For squadrons fighting, ironclads are vital. The part played by the two Chinese battleships saved a great part of the enemy's fleet."

The admiral laughed when I asked him what he thought of the Chinese as sea fighters.

"They are very brave men," he said. "Not a ship hoisted the white flag, and their gunners kept at work all the time, although their aim was not very good toward the end, Yes; the Chinese fought courageously. No man can deny it. While they preserved their fleet formation they showed wisdom in their fighting, but after we broke up the lines each captain seemed to be acting independently. But the two ironclads were well handled. I must say that."

And so ends the first real trial of strength on the sea between the forces of civilization and barbarism in Asia.

PENETRATION OF MODERN RIFLES.

A report has been issued by the Small Arms Penetration Committee, under the presidency of Colonel T. Fraser, C. B, C. M. G., R. E., which deals with the penetration of the Lee-Metford, Mannlicher, and Martini-Henry rifles. The Lee-Metford has a 0 303 in. bore, with a bullet weighing 215 grains, sectional density 0 3346 specific gravity 10·484, and a muzzle velocity of 1,975 to 2,000 foot seconds. The bore of the Mannlicher is 0 256 in., with a bullet of 160 grains, sectional density 0·3488, specific gravity 10·405, and a muzzle velocity of 2 300 to 2 400 foot seconds. The Martini-Henry bore is 0·450 in., the weight of bullet 480 grains, sectional density 0·3386, specific gravity 10,916, and a muzzle velocity of 1,270 to 1.300 foot seconds. Cordite was used throughout the trials, the muzzle velocities showing a difference of as much as 100 foot seconds. The most remarkable difference in this respect is that recorded of the Mannlicher gun, the velocities of which fell off very considerably during the firing of 1,000 rounds, owing to the erosion of the barrel. Our own service weapon was not affected after firing as many as 3,000 rounds. The bulk of 150 rounds of Lee-Metford and Mannlicher ammunition were about the same, but the weights were 9 lb. and 7 lb. respectively. The report states that the main advantage of the Mannlicher is the greater flatness of its trajectory and consequently its greater margin of effect at decisive ranges. Thus the 6 ft. margins at 1,000 yards are for he Mannlicher 168 ft. for the Lee-Metford 156 ft., and for the Martini-Henry 8? ft. Remarking upon this, the committee state that so long as the very small bullet now in use is effective against troops the importance of this length of margin outweighs all other considerations. As regards accuracy of fire, when once the sighting was obtained, the Mannlicher was very good, and was rather better at 1,000 yards than the Lee-Metford. The recorded effects of the fire of the rifle named against definite objectives are very curious. The small bore rifles easily penetrated a 9 in brick wall, with ½ in. boards at the joints, though the bricks themselves resisted the bullets. At 100 yards some of the bullets penetrated the joints of the wall and two ¾ in. deal board. At 600 yards the bullets passed through the joints of a 4½ in. wall and 7¾ in. boards beyond, and at 400 yards bullets passed through the joints of a 14 in. wall and two ¾ in. boards. At 200 yards 200 rounds breached a 9 in. wall so that a man could get through a hole which, on measurement, proved to be 24 in. by 15 in. At the same range it took 1,028 rounds, mostly in volleys of 50. to make a smaller breech in a 14 in. wall A wall with ⅜ in. joints of hard mortar was found to be practically impervious to the new small-bore bullets. Hence brick walls for defenses should be 9 in thick with five joints set in cement. Sun-dried brick walls, as used in India, 18 in. thick, were found to be bullet proof, except after continued firing. A singular fact is that in such walls the mean penetration increases gradually from 5 in., at a range of 3 yards, to 15 in., at 400 yards and then slowly decreases. Fresh or green mud walls require to be at least 4 ft. in thickness to stop bullets at any ranges With screens of mild steel or wrought iron, a thickness of 7–16 of an inch is required for safety, but at 60 yards a plate of hardened steel, weighing 8.75 lb. per square foot, will stop a Lee-Metford bullet. Against a Mannlicher a quarter inch plate of hardened steel is required at short distances. At 500 yards a plate of hardened steel, less than 1–10 of an inch thick, weighing only 3 lb. 10 oz per square foot, resisted all the small-bore bullets The committee recommend this plate for field artillery shields against musketry, if such be ever adopted, as artillery are not likely to engage infantry at ranges under 500 yards. The new small-bore rifles, with their steel coated bullets, were found to have much greater penetration than the Martini-Henry with its unsheated bullet at 1,500 yards. The statement is made in the report that with the new rifles timber is no longer of any use as cover at short ranges, owing to the great thickness required. And no longer will growing timber give the protection it has hitherto. On the other hand, a much smaller quantity of timber in the form of boards, made into troughs or wooden boxes, or hurdle troughs with shingle or sand between, will completely stop the new bullets. In the absence of shingle, a few inches of the macadam of roads will supply the necessary core. As regards times of flight, the new arms are very superior to the Martini-Henry.—Arms and Explosives.

The Best of Them All.

An English General, in reviewing a corps of cavalry, suddenly stopped before a splendid-looking fellow, and asked abruptly, "Which is the best horse in the regiment?" "No. 40, sir." "What makes you think it is the best horse?' "He walks, trots and gallops well, is a good jumper, has no vice, no blemish, carries his head well, is in his prime.' "And who is the best soldier in the regiment?" "Tom Jones, sir." "Why?' "Because he is an honorable man, is obedient, tidy, takes good care of his equipment and horse, and does his duty well." "And who is the rider of the best horse?" "Tom Jones, sir." "And who is Tom Jones?" "I am, sir." The General could not help laughing. He gave a sovereign to his informant, who received it without moving a muscle.