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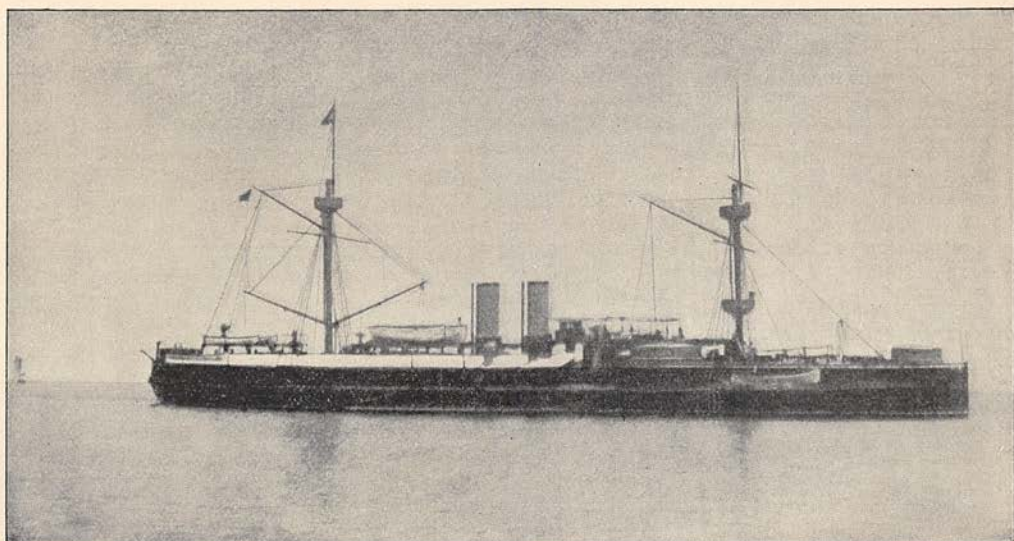
CHINESE SAILORS FROM THE PEI YANG SQUADRON, EQUIPPED AS INFANTRY.

THE BATTLE OF THE YALU.

PERSONAL RECOLLECTIONS BY THE COMMANDER OF THE
CHINESE IRONCLAD "CHEN YUEN."

IN attempting an untechnical description of the battle between the Japanese and Chinese fleets which took place September 17, 1894, off the Yalu River, I wish to disclaim for the narrative any pretension to a professional report. Not only would technical language probably be unintelligible to lay readers unacquainted with naval science, but I frankly confess my inability to make such a report with entire accuracy. In a battle which lasted five hours, every moment of which was full of interesting incident, and in which single-ship com-

bats were frequent, no officer could spare time from his duties to note all that was going on. Moreover, during the latter part of the engagement I was suffering from wounds, one of which almost blinded me. Although I remained on deck, I could see only dimly, with interruptions. During this period the *Chen Yuen* was conned by my colleague, Yang Yung Ling, a gallant and spirited officer who, to his country's loss, ended his life with a pistol-ball at Wei-Hai-Wei just as the Japanese came alongside to take the ship after the surrender. I shall there-



FROM A PHOTOGRAPH.

CHINESE IRONCLAD "CHEN YUEN" — SISTER SHIP TO THE FLAG-SHIP "TING YUEN."



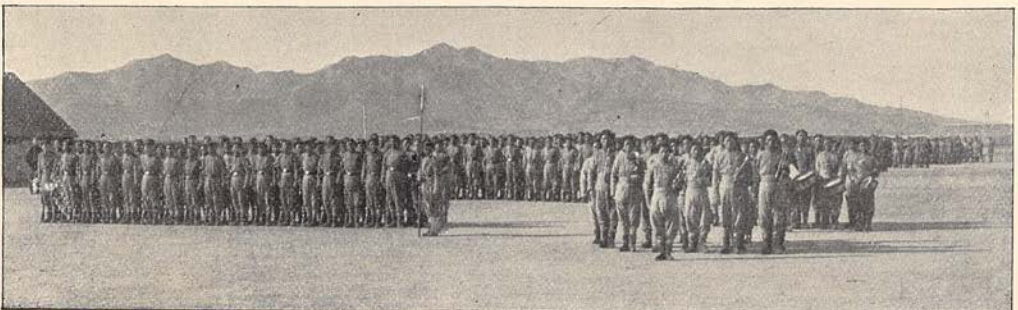
FROM A PRINT.
ADMIRAL TING JU CHANG, COMMANDER OF THE CHINESE
PEI YANG SQUADRON IN THE BATTLE OF THE YALU.

fore at times be obliged to employ hearsay evidence; but in so doing I have taken care to use only that which I feel to be reliable.

About ten o'clock on the morning of September 15, 1894, the Pei Yang squadron, commanded by Admiral Ting Ju Chang, consisting of the two ironclads *Ting Yuen* (flag-ship) and *Chen Yuen*, the two armored cruisers *King Yuen* and *Lai Yuen*, the two protected cruisers *Chih Yuen* and *Ching Yuen*, the two torpedo cruisers *Tsi Yuen* and *Kwang Ping*, the coast-defense ship *Ping Yuen*, the two Armstrong cruisers *Chao Yung* and *Yang Wei*, and the corvette *Kwan Chia*, with two torpedo-boats, arrived at Ta-Lien-Wan. Here we found four "alphabetical" gunboats and four

torpedo-boats, besides five chartered merchant vessels which were busily embarking troops. The day was spent in coaling the fleet. Toward dark another chartered steamer arrived from Port Arthur with 80 Krupp field-guns, 400 ponies, and 500 artillerymen. About midnight the embarkation was completed, and shortly before 1 A. M. (Sunday, the 16th), the fleet, consisting of eleven war-ships, four gunboats, and six torpedo-boats, weighed anchor, and proceeded to convoy the transports to the Yalu, arriving off the mouth of that river, without incident, in the afternoon. The convoy, escorted by the four gunboats and four smallest torpedo-boats, with the *Ping Yuen* and *Kwang Ping*, crossed the bar, and went up the river some fifteen miles, where the disembarkation was begun and carried on all night.

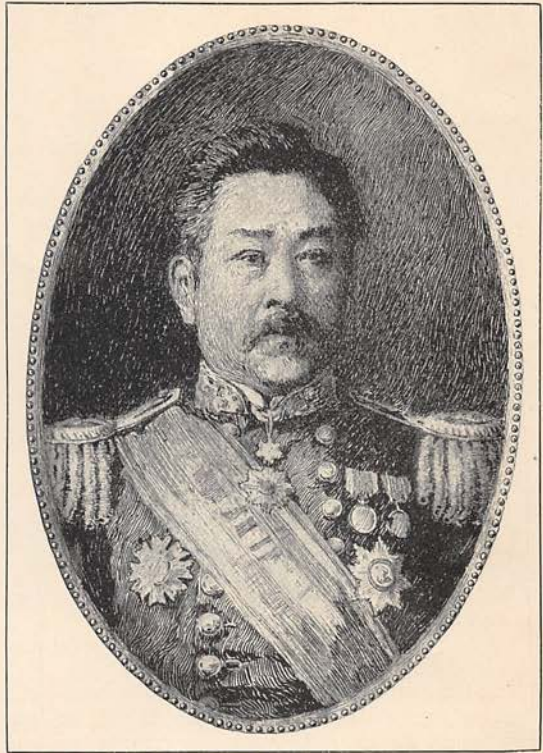
The next morning, Monday, the memorable 17th of September, was a beautiful day, a light breeze gently ruffling the surface of the water. The forenoon was passed as usual. At 9:15 each ship went to general quarters, cleared for action, and for an hour exercised the crew at the guns, no one dreaming that the results of our training were so soon to be tested. As usual, the crews were full of spirit, and eager to avenge, in a fleet engagement, the loss of the *Kwang Yih* and *Kow Shing*. The jeers which the "soldiers" at Wei-Hai-Wei and Port Arthur were wont to fling at us for not destroying the enemy's fleet had not ceased to rankle. As certain newspapers did not at that time hesitate to accuse Admiral Ting of cowardice in failing to bring on an engagement by searching out the enemy, let me state that, after the so-called "bombardment" of Wei-Hai-Wei, a most positive order came from the Tsung Li Yamen (Office of Foreign Affairs) that he was on no account to cruise eastward of a line drawn from Shantung lighthouse to the mouth of the Yalu. The gallant old sailor resented this, and also disaffections existing in a certain clique of his officers, yet he could not disobey. But the Japanese were under no such order, and they could have found us



FROM A PHOTOGRAPH.
NAVAL BATTALION FROM THE PEI YANG SQUADRON, DRILLING ON THE PARADE-GROUND AT WEI-HAI-WEI.

when they pleased, as we cruised freely to the westward of the line mentioned. At that time it would seem that the enemy hesitated to attack. Our ships were well armed and protected, and our gunners made excellent practice, as had been seen during the summer evolutions. This does not imply any personal reflection upon the Japanese, who are as gallant a race of men as exists. Perhaps they had too much at stake. The destruction of the Japanese fleet would have given the Chinese command of the sea. The small Japanese army in Korea, thus cut off from reinforcements and supplies, would in that event have been overwhelmed by mere force of numbers. Before the battles at the Yalu and Ping Yang the Chinese equaled the Japanese in their eagerness to fight; but as the result of these battles gave increased courage to the one, in like measure it disheartened the other.

From the outbreak of hostilities, officers and men had worked incessantly to put our ships into as efficient fighting trim as possible. Profiting by the lessons taught in the *Tsi Yuen* and *Kwang Yih*'s hapless encounter with the enemy off Baker Island, Korea, on July 25, all boats were left behind, save one six-oared gig for each vessel. In case of disaster, quarter was not expected, nor was surrender contemplated. The fate of the ship was to be the fate of the crew. The *Tsi Yuen*'s boats had been shattered and set on fire almost immediately, and had been extinguished only after much trouble, and after they had been rendered totally unserviceable. The heavy steel gun-shields, one inch thick and over thirty feet in diameter, which covered the two pairs of 30.5-centimeter (12.2-inch) Krupps on the ironclads, were also removed. As they revolved with the guns a shot might easily jam them, and, being too thin to keep out any but light machine-gun missiles, they would have served only as man-traps, since shells which might pass directly over the barbette and on when meeting no resistance, if intercepted by these shields would have penetrated and, bursting, have filled the entire closed space with flame and fragments.¹ Subsequent experience proved the wisdom of this removal, for many a shell passed close over the heads of the gunners. All unnecessary woodwork, rigging, etc., were taken away, the side wings of the bridge cut off, all hand-rails and ladders removed, and



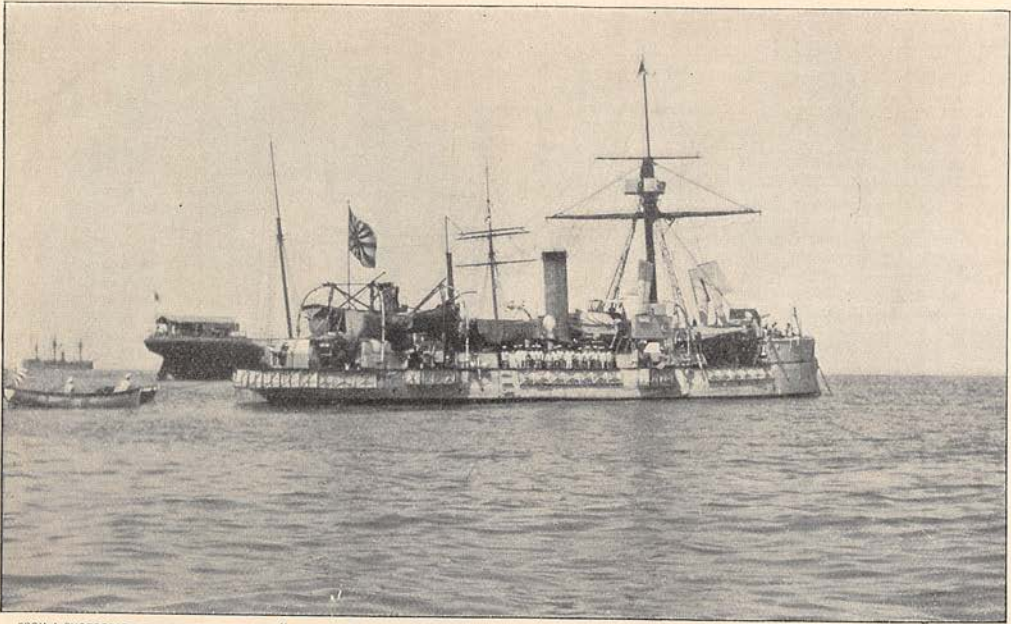
DRAWN BY ERIC PAPE, AFTER A JAPANESE PRINT.

VICE-ADMIRAL ITO, COMMANDER OF THE JAPANESE FLEET
IN THE BATTLE OF THE YALU.

rope or wire life-lines and "Jacob's ladders" substituted when possible. The shields on the 6-inch guns, bow and stern, were kept on to protect the gun-crews from the blast of the heavy guns where firing ahead or astern. The ships had been painted an "invisible gray." Hammocks were placed as a small protection to the men at the quick-firing guns, and within the superstructure sand-bags were piled along the sides about three feet deep and four feet high. Lying inside of these on deck were kept some dozens of 100-pound shot and shell for the 6-inch guns, to promote quick service. Much of the glass was unshipped; the rest the Japanese unshipped for us in time. Coal in bags was also utilized for protection where possible. This protection by coal- and sand-bags served admirably, a number of projectiles and fragments having been found in them after the battle. When the bugles sounded "action" but little remained to be done save to lower to the deck the ventilators, or wind sails (which obstructed the fire of the guns), to close scuttles, water-tight doors, etc., and go to stations.

¹ In the engagement of July 25, a Japanese shell with base fuse, fired at long range, had plumped down on top of a similar shield of the *Tsi Yuen* (covering the two heavy bow guns), near the rear part of it, and had burst, the point going out through the side of the

shield, while the remainder of the shell, in fragments, had hurtled about inside, killing seven, including the gunnery lieutenant, and wounding fourteen, thus disabling every one of the crew inside at the time. Had the shield been removed, this shell would have gone clear.



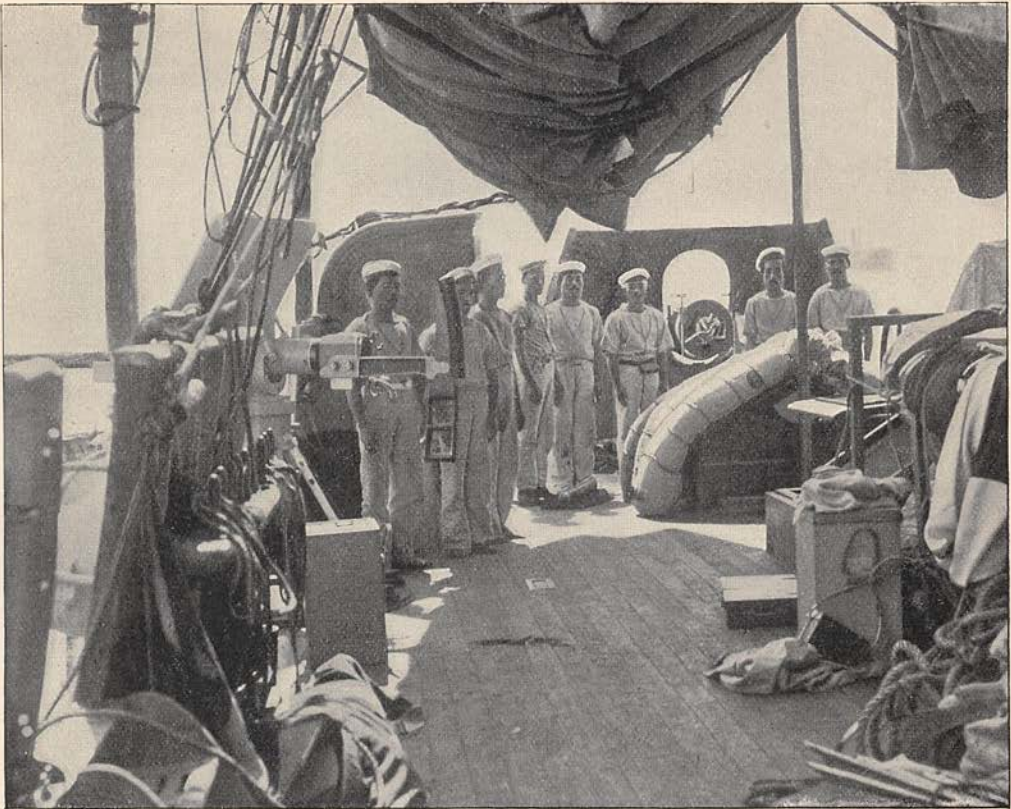
FROM A PHOTOGRAPH BY AN OFFICER OF THE "SAIKIO MARU."

THE "AKAGI."

The accompanying tables show the comparative strength of the two fleets. It will be seen what an overwhelming superiority in quick-firing guns the Japanese had, while our seeming strength in heavy guns was more apparent than real in action, where ranges are uncertain. To explain this, let me digress a moment. It is well known that a projectile

THE JAPANESE FLEET.

Ships' Names.	Displacement.	Armor (in inches).		GUNS.	Torpedo discharges.	Speed, knots.
		On belt.	On turret, barquette, or battery.			
	Tons.					
Matsushima	4,277	0	12	One 13-in., eleven 5-in., five 6-pounder quick-firing, eleven 3-pounder quick-firing, six machine-guns.	4	17.5
Itsukushima	4,277	0	12	One 13-in., eleven 5-in., five 6-pounder quick-firing, 11-pounder quick-firing, six machine-guns.	4	17.5
Hasidate	4,277	0	12	One 13-in., eleven 5-in. quick-firing, six 3-pounder quick-firing, fifteen machine-guns.	4	17.5
Chiyoda	2,450	4½	0	Ten 5-in. quick-firing, fourteen 4.7-in. quick-firing, thirteen machine-guns.	3	19.0
Fuso	3,718	7	9	Four 9½-in., two 7-in., eight machine-guns.	0	13.2
Hiyei	2,200	4½	Hull composite.	Three 7-in., six 6-in. guns.	0	13.0
Takachiho	3,650	0	0	Two 10-in., six 6-in., twelve machine-guns.	4	18.7
Yoshino	4,150	0	0	Four 6-in. quick-firing, eighteen 4.7-in. quick-firing, twenty-two 6- and 3-pounder quick-firing.	5	23.0
Naniwa	3,650	0	0	Two 10-in., six 6-in., twelve machine-guns.	4	18.7
Akitsushima	3,150	0	0	One 13-in., twelve 5-in. quick-firing, ten machine-guns.	4	19.0
Akagi	615	0	0	One 9½-in., four 5-in. quick-firing, six machine-guns.	0	12.0
Saikio Maru	0	0	0	"Fitted with quick-firing guns as a cruiser."	0	about 16½



FROM A PHOTOGRAPH BY AN OFFICER OF THE "SAIKIO MARU."

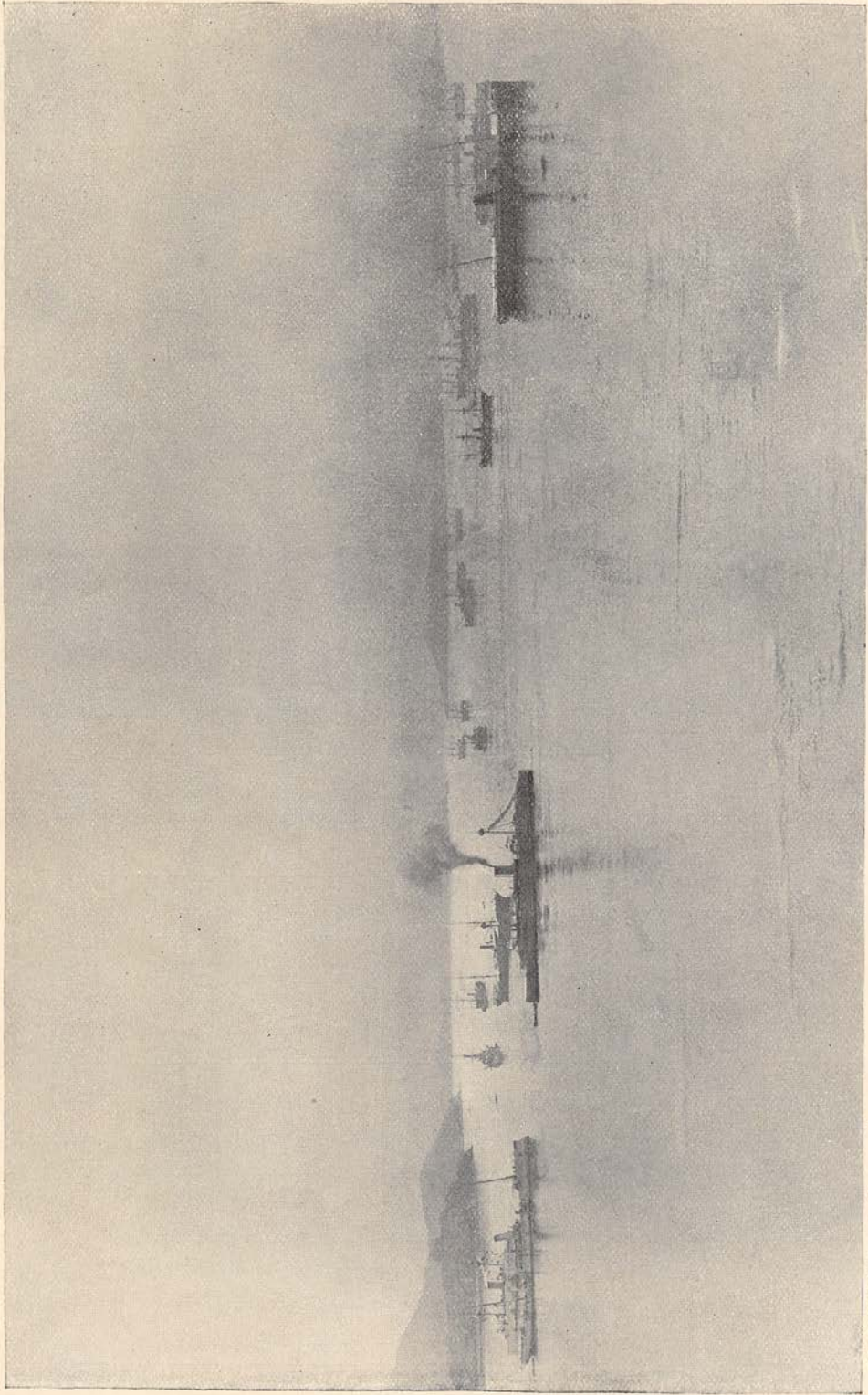
THE AFTER PART OF THE UPPER DECK OF THE "AKAGI."

from a gun does not travel in a straight line, powder impulse, describes a curve. The greater but, under the influences of gravity and the the impulse, the flatter or straighter this curve,

THE CHINESE FLEET.

Ships' Names.	Displacement.	Armor (in inches).		GUNS.	Torpedo discharges.	Speed, knots.
		On belt.	On turret, barbette, or battery.			
Ting Yuen } Chen Yuen }	Tons. 7,430	14	12	Four 12.2-in., two 6-in., twelve machine-guns.	3	14.5
Lai Yuen } King Yuen }	2,850	9½	8	Two 8¼-in., two 6-in., eight machine-guns.	4	15.0
Ping Yuen.....	2,850	8	5	One 12.2-in. Krupp, two 6-in., eight machine-guns.	4	12.0
Chih Yuen } Ching Yuen }	2,300	0	0	Three 8.4-in., two 6-in., sixteen machine-guns.	4	18.0
Tsi Yuen.....	2,355	0	6	Two 8.4-in., one 6-in., ten machine-guns.	4	15.0
Chao Yung } Yang Wei }	1,350	0	0	Two 10-in., four 40-pounders, seven machine-guns.	0	16.0
Kwang Ping.....	1,030	0	Hull partly of wood.	Three 4.7-in. quick-firing, eight machine-guns.	4	16.5
Kwan Chia.....	1,300	0	0	Three 6-in., four 5-in., eight machine-guns.	0	15.0

NOTE.—Upon the outbreak of hostilities both nations strengthened their ships' armament. I have given the armament of both Japanese and Chinese ships as they were on September 17, 1894, to the best of my knowledge and recollection, but complete accuracy is not claimed. P. N. MCG.



FROM A PHOTOGRAPH BY AN OFFICER OF THE "SAKIO MARU."
THE JAPANESE FLEET IN CHOCHOKURO, ON THE SOUTH COAST OF KOREA, SEPTEMBER 9, 1894, EIGHT DAYS BEFORE THE BATTLE.



FROM A PHOTOGRAPH.

VICEROY LI HUNG CHANG.

or "trajectory," will be. To hit an object at a certain range, therefore, a gun giving a shot a lower velocity than another will have to be pointed so as to make a greater angle upward with a line drawn from gun to target than will the one of higher velocity. In the diagram, let C represent one of the Chinese 12.2-inch Krupp guns of 25 calibers' length of bore (25×12.2 -in.), and J represent a Japanese 13-inch Canet gun of 40 calibers, the latter being of much higher power. A gunner at C, assuming J to

be at J, fires, and the shot traces the curve C J. Now if J, assumed at J, happens instead to be actually at J' or J'', C's shot will still strike the ship represented as carrying the gun J either at the upper deck or at the water-line. J, likewise, assuming C to be at C, fires, and his shot traces the curve J C. But if C is really at C' or C'', instead of at C, J's shot will, as in C's case, either hit on the upper deck or at the water-line. It is evident that the space C' C'' is greater than J' J'', on ac-

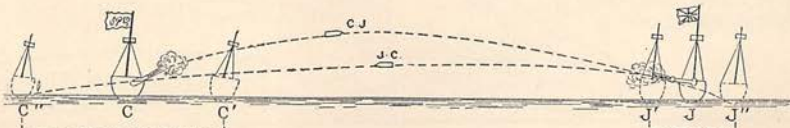
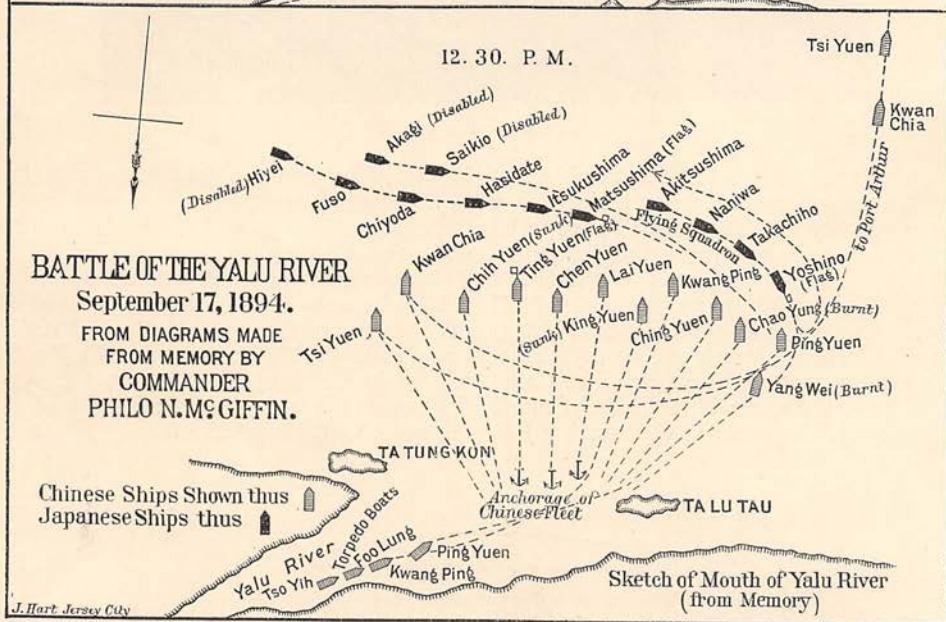
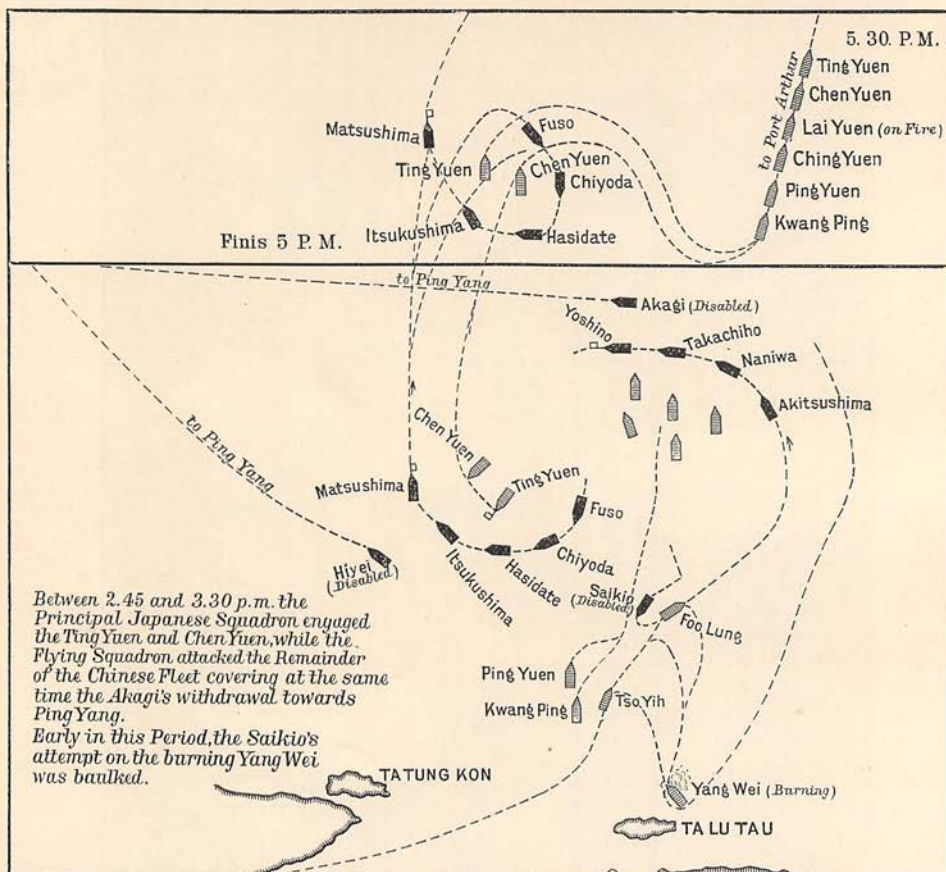
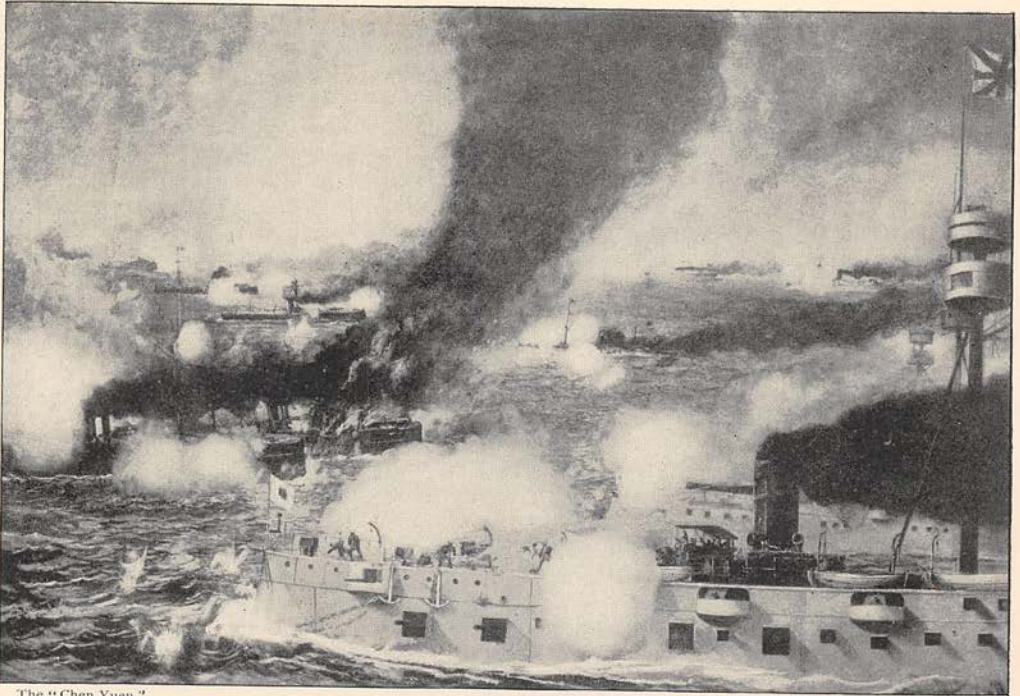


DIAGRAM SHOWING INCREASED ACCURACY OF HIGH-POWER GUNS WHEN RANGES ARE UNCERTAIN, OWING TO THE FLATTENING OF THE TRAJECTORY.



J. Hart, Jersey City



The "Chen Yuen."

THE BATTLE OF THE YALU: THE PRINCIPAL SQUADRON ENGAGING THE "TING YUEN" AND "CHEN YUEN."

DRAWN BY BUNGO SAKUMA.

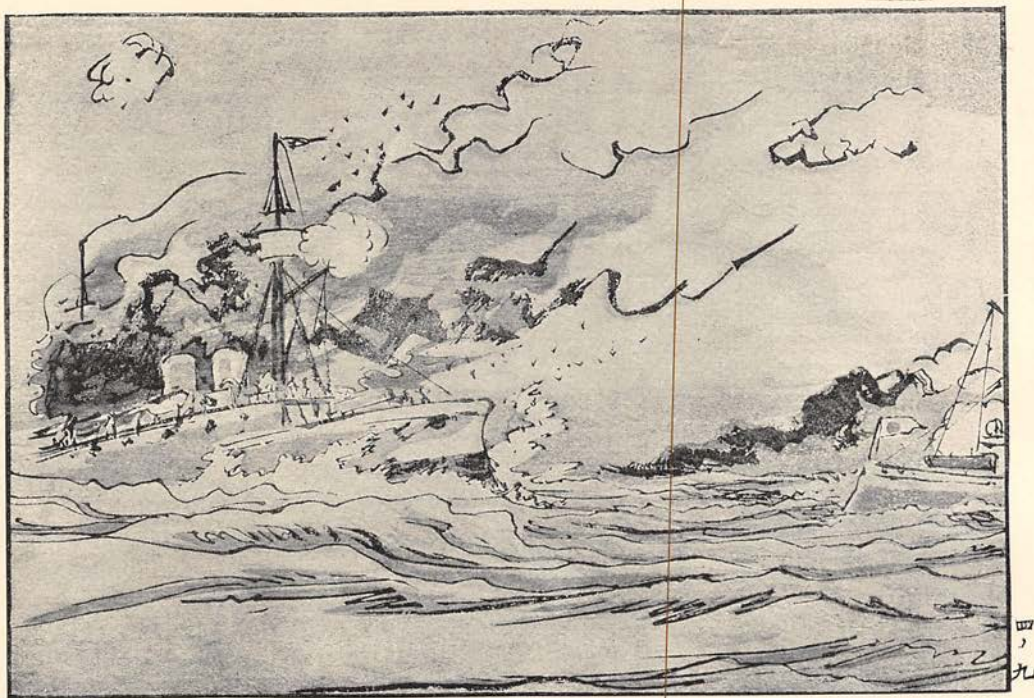
count of the flatter trajectory of J's gun. The distance $C' C''$ (or $J' J''$) is termed the "dangerous space," and it is at once seen that when ranges are uncertain the gunner at J has a great advantage, owing to his gun's flatness of trajectory, over the one at C.

No ordinary method of finding the range is of much use in a fleet action. Using "mast-head angles," the range is found by measuring the angle subtended by the enemy's masthead and water-line (the height of mast being known). The "horizon method" depends on measuring the angle between the enemy's water-line and the horizon, the observer being stationed in a top whose height above water is known. In the latter case it is inconvenient to have the observer so far from the guns, and in either method the smoke on one side or the other generally conceals the enemy's water-line. In using a quick-firing gun, the place where the projectile hits must be seen, and this is equally difficult when shots are splashing up the water all about the object aimed at. It is needless to point out the importance of practising both officers and men in judging distances under all conditions at sea. But to resume.

The *Chen Yuen's* forenoon routine, drills and exercises, had been carried out, and the cooks were preparing the midday meal, when the smoke from the enemy's ships was sighted by the lookout men at the masthead. They were made out almost simultaneously from several vessels,

and before even a signal could be made from the flag-ship the bugles throughout the fleet were sounding merrily the "officers' call" and "action." Columns of dense black smoke shooting upward from our funnels told that in the depth of each vessel the stokers were spreading fires, and, using forced draft with closed stoke-holes, were storing up energy in the boilers, that breath might not fail when most needed in the coming fight. These black pillars of smoke must have signaled our presence to the enemy; for their "smokes" now increased in volume and height, showing that they also had put on forced draft, and, like ourselves, were preparing for the contest. For weeks we had anticipated an engagement, and had had daily exercise at general quarters, etc., and little remained to be done. There were woeful defects in our ammunition supplies, as will be seen; but had we kept the seas for a year longer before fighting, there would have been no improvement in that respect, since the responsibility for the neglect lay in Tientsin. So the fleet went into action as well prepared as it was humanly possible for it to be with the same officers and men, handicapped as they were by official corruption and treachery ashore.

In far less time than is taken to read these lines signal had been made from the *Ting Yuen* to "weigh immediately," and never were cables shortened in and anchors weighed more speedily. The old *Chao Yung* and *Yang Wei*,



FROM A JAPANESE PRINT.

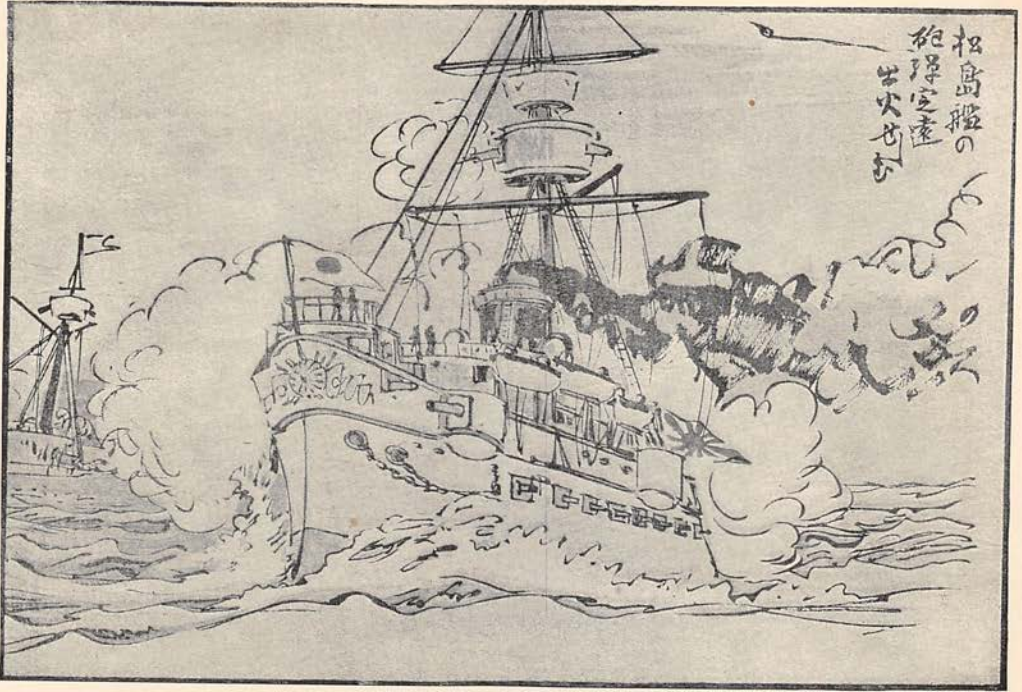
ENCOUNTER BETWEEN THE CHINESE IRONCLAD "CHEN YUEN"

being always longer in weighing anchor, were left astern, and afterward, pushing on to gain station, probably gave to the fleet a seeming wedge-shaped formation for a short time, thereby giving rise to the report, widely circulated, that we used that formation in advancing to the attack. Our actual formation, which has justly been criticized, was an indented or zigzag line, the two ironclads in the center, as shown in the diagram. As the two fleets approached each other, officers and men eagerly strained their eyes toward the magnificent fleet of their country's hereditary foe, and on all sides there were animation and confidence. Our fleet consisted now of ten ships, viz.: *Ting Yuen* (flag-ship), *Chih Yuen*, *Tsi Yuen*, and *Kwan Chia*, forming the left wing; and *Chen Yuen*, *Lai Yuen*, *King Yuen*, *Ching Yuen*, *Chao Yung*, and *Yang Wei*, forming the right wing. It will be noticed that the right wing, as such, was stronger than the left, or admiral's. But the enemy, approaching from left to right, would thus receive the fire of our best eight ships before they could attack the *Chao Yung* and *Yang Wei*, justly considered our "lame ducks." The *Ping Yuen* and *Kwang Ping*, with the two torpedo-boats *Foo Lung* and *Tso Yih*, did not join us until the fight was well under way. The gun-boats and the other torpedo-boats did not appear at all.

The Japanese formed into two squadrons: The Flying Squadron, consisting of the *Yoshino* (flag), *Takachiho*, *Naniwa*, and *Akitsushima*, led, followed by the Principal Squadron, composed of the *Matsushima* (flag of Admiral Ito, commander-in-chief), *Itsukushima*, *Hasedate*, *Chiyoda*, *Fuso*, and *Hiyei*. On the unengaged side were the *Akagi* and *Saikio*.

These twelve Japanese ships, forming apparently a single line and preserving station and speed throughout most beautifully, could not but excite a feeling of admiration. Our fleet must also have presented an imposing appearance to the enemy. Since 8 A. M. our ensigns had been flying from their accustomed hal-yards, but now there streamed from the *Ting Yuen's* main-truck an immense yellow new national ensign, a similar one succeeding the smaller weather-worn ensign previously hoisted, the admiral's flag at the fore-truck being also replaced by a larger one. A similar change was made on every other ship almost at once, and the Japanese promptly followed our example.

These twenty-two ships, trim and fresh-looking in their paint and their bright new bunting, and gay with fluttering signal-flags, presented such a holiday aspect that one found difficulty in realizing that they were not there simply for a friendly meeting. But, looking closer on the *Chen Yuen*, one could see beneath this gaiety much that was sinister. Dark-

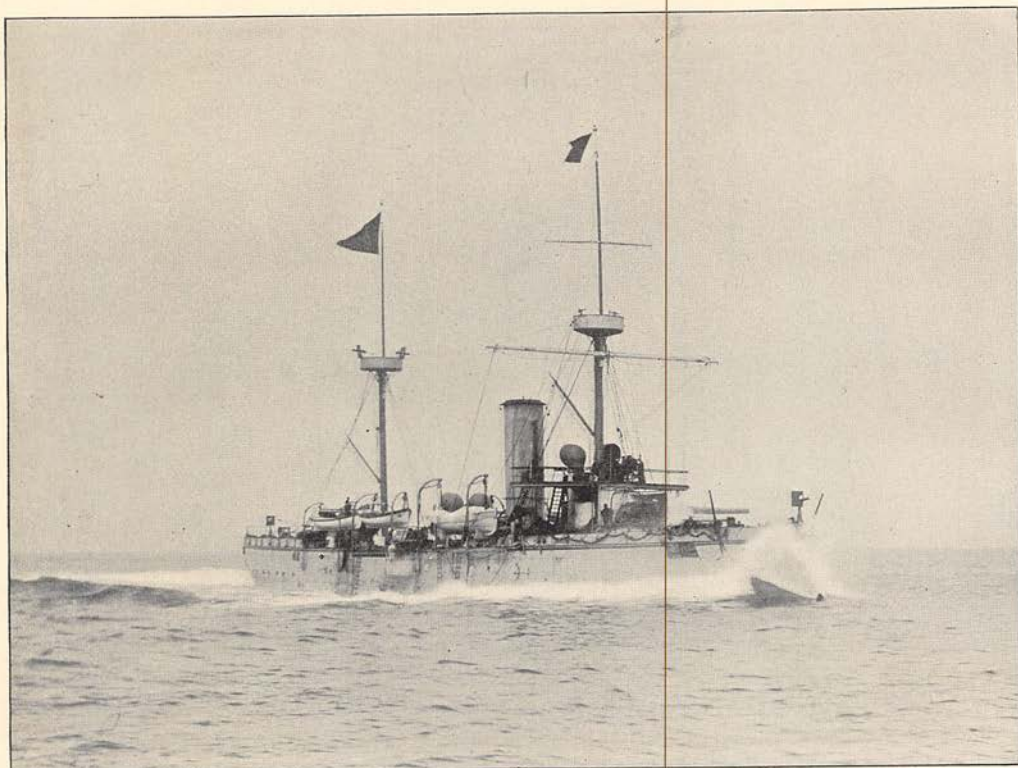


AND THE JAPANESE FLAG-SHIP "MATSUBISHI."

skinned men, with queues tightly coiled around their heads and with arms bare to the elbow, clustered along the decks in groups at the guns, waiting impatiently to kill and be killed. Sand was sprinkled on the decks, and more was kept handy against the time when they might become slippery. In the superstructures and down out of sight in the bowels of the ship were men at the shell-whips and ammunition-hoists, in torpedo-rooms, etc. Here and there a man lay flat on deck, with a charge of powder—fifty pounds or more—in his arms, waiting to spring up and pass it on when it should be wanted. These men were stationed at intervals to serve the guns quickly; for charges must not be massed along the deck, lest a shell drop in and make trouble. The nerves of the men below deck were in extreme tension. On deck one could see the approaching enemy, but below nothing was known, save that any moment might begin the action, and bring a shell in through the side. Once the battle had begun, they were all right, but at first the strain was intense.

The fleets closed on each other rapidly. My crew was silent. The sublieutenant in the military foretop was taking sextant angles and announcing the range, and exhibiting an appropriate small signal-flag. As each range was called the men at the guns would lower the sight-bars, each gun captain, lanyard in hand,

keeping his gun trained on the enemy. Through the ventilators could be heard the beats of the steam-pumps; for all the lines of hose were joined up and spouting water, so that in case of fire no time need be lost. The range was about four miles, and decreasing fast. "Six thousand meters!" "Five thousand eight hundred"—"six hundred"—"five hundred"—"five hundred!" "Five thousand four hundred!" The crisis was rapidly approaching. Every man's nerves were in a state of tension, which was greatly relieved as a huge cloud of white smoke, belching from the *Ting Yuen's* starboard barbette, "opened the ball." Just as the projectile threw up a column of white water a little short of the *Yoshino*, a roar from the *Chen Yuen's* battery seconded the flag-ship's motion. It was exactly 12:20 P. M. The range, as found on the *Chen Yuen*, was 5200 meters; on the *Ting Yuen* it was assumed to be 5300. On our side the firing now became general from the main batteries, but it was about five minutes before the Japanese replied. As they opened fire, the Chinese quick-firing Hotchkiss and Maxim-Nordenfolt, 3- and 6-pounders, joined in, and thenceforward the conflict was almost incessant. Like ours, the enemy's first shots fell short; but with an exultant chuckle we noted that a shot from one of our 12-inch guns had struck one of the Japanese leading ships. The bridge of the *Chen Yuen*, although some thirty feet above



FROM A PHOTOGRAPH.

THE CHINESE SHIP "CHIH YUEN," SUNK IN THE BATTLE.

The ship is here shown at full speed. The bow torpedo-tube parts the spray as seen at water-line, but offers only slight resistance.

the water, was very soon soaked, as was, indeed, the entire exposed surface on the engaged side, by spray thrown up by line shots that struck the water a little short. Many of the men at the guns on deck were wet through, and indeed the water was flung on board with such violence as to sting the face and hands like hail. Every one in the conning-tower had his ears stopped with cotton, yet the din made by projectiles rattling up against the outside of its 10-inch armor was a serious annoyance.

During this early part of the engagement, the Chinese fleet as a whole kept their indented line, and preserved intervals fairly well, steaming at about six knots—the *Chao Yung* and *Yang Wei* being still out of station on the extreme right. The *Tsi Yuen*, with her faint-hearted commander, Fong, had bolted very soon after the enemy had opened fire. At 12:45 we saw this vessel about three miles astern on our starboard quarter, heading southwest toward Port Arthur. She was followed by a string of Chinese anathemas from our men at the guns. She reached Port Arthur at 2 A. M. next day (seven hours in advance of the fleet), spreading there a wild tale that we had been overwhelmed by a vast Japanese armada, etc. Upon our arrival, Captain Fong claimed that his entire battery had early

been disabled, and that he had been obliged to run to save his defenseless ship. But upon an examination of his battery by a detail of line and engineer officers, it was found in perfect working order, excepting the six-inch stern-chaser—the one projectile which struck his ship having passed beneath the trunnions, lifting the gun from its seat. But this shot had entered from the stern, having evidently been received after the retreat had begun—administered, it would seem, as a contemptuous parting kick from the enemy. Captain Fong's outrageous example was at once followed by the commander of the *Kwan Chia*, whose courage was scarcely exceeded by his knowledge of navigation; for, about midnight, he ran upon a reef outside of Ta-Lien-Wan, which he said was a most unaccountable mishap, as he had laid his course (in a 100-mile run) "to clear it by *one and a half miles*!" This vessel had not been struck at all, but some days later was blown up by her crew upon the approach of some Japanese vessels. Our force had thus early been reduced to eight vessels.

As the Japanese fleet approached, it steamed along our front from left to right, at perhaps double our speed, and each vessel thus could exchange shots with each of ours in turn. The

Japanese Principal Squadron, as will be seen from the diagram, kept at closer range, upon the whole, than did the Flying Squadron. The latter, upon reaching our right flank, turned it and poured in a heavy cross-fire on the extreme wing, the *Chao Yung* and *Yang Wei* receiving the most of it. From the first these two old-fashioned cruisers were doomed. Two passageways in each superstructure connected the bow and stern 10-inch guns, on the outboard side of each being officers' quarters, etc., the partitions and bulkheads being of wood highly varnished and oiled. The vessels were early set on fire, and the draft down these passageways at once turned them into alleys of roaring flame. The machine-guns overhead were thus rendered useless, the deck being untenable, and the bow and stern guns were isolated from each other and from their magazines. As a forlorn hope, the ill-fated vessels made for the nearest land. The Japanese armed transport *Saikio*, seeing their plight and intention, made for them; whereupon the Chinese ironclads

engagement, came up and headed for her, and her amiable intentions toward the burning vessels were frustrated.

By this time the Flying Squadron had altered course sixteen points (180°) to port, and were returning, evidently to succor the *Akagi*, which was in a sad plight, having pluckily engaged us at pretty close range, and was now steering wildly, her mainmast gone, her commander and a considerable number of her crew killed, and her battery disabled.

We had now (about 2 P. M.) six vessels, viz.: the *Ting Yuen*, *Chen Yuen*, *King Yuen*, *Lai Yuen*, *Chih Yuen*, and *Ching Yuen*,—the *Ping Yuen* and *Kwang Ping* not yet having joined us. The flag-ship *Matsushima*, leading the Principal Squadron, had now reached our right wing, and, flanking it, steamed down again on the opposite course. The *Hiei*, the last of the Principal Squadron, was now almost ahead of the *Ting Yuen*, having been engaged by the *Chih Yuen* on our flag-ship's left. Her distance from her next in line ahead was increasing, and her



THE CREW OF THE "CHIH YUEN." ALL BUT SEVEN OF THE CREW WERE DROWNED ON THE SINKING OF THE SHIP.

fired a few shots at her at long range, making fair practice; for, according to Japanese report, she received at least four 30.5-centimeter projectiles. Then the *Ping Yuen* and *Kwang Ping*, with the two torpedo-boats that had been inside the Yalu River at the beginning of the

captain, presumably seeing that his slow old ship could not keep up with the rest, and, being already on fire, fearing to continue on and receive the fire of both ironclads and of the *King Yuen*, *Lai Yuen*, and *Ching Yuen*, boldly decided to make a short cut between the two

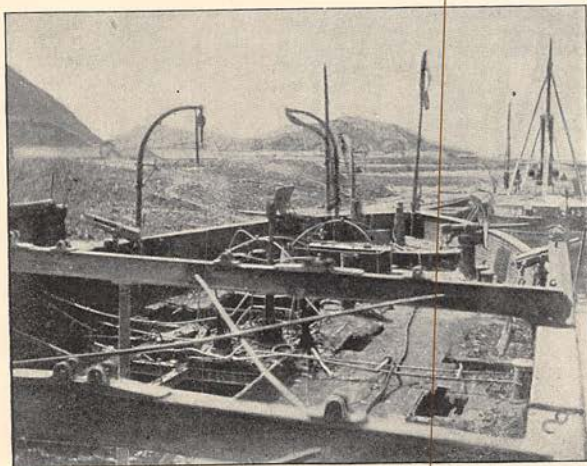


FROM A PHOTOGRAPH.
COMMANDER MCGIFFIN IN HOSPITAL AFTER THE FIGHT—
SHOWING DAMAGE TO CLOTHES DUE TO CONCUSSION.

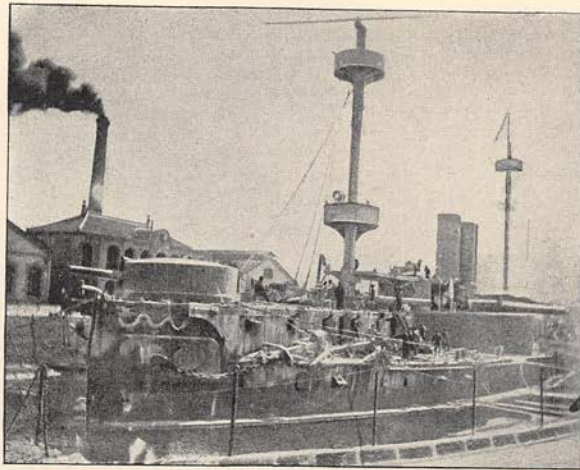
ironclads and rejoin his comrades on the other side. This was splendidly done. As his ship passed between our two big ships we fired into her point-blank. It was impossible to miss, and flying material showed that we did not. The smoke increased in volume and rolled up from the *Hiyei's* quarter-deck and poop as high as the mizzen-top, the ship yawing wildly at the same time. We considered her "done for"

— as doubtless she would have been had we used shell — one shot, for instance, passing diagonally through the ship from one bow to the opposite quarter, doing various minor damages. Had it been a live shell the result may be imagined.

From this time, I regret to say, the Chinese formation was broken into an irregular group. Bearing down on the one hand were the ships of the Principal Squadron, "in line ahead," keeping perfect station, while on the opposite side were those of the Flying Squadron. We were thus between two fires. As the Principal Squadron turned and altered course, the two Chinese ironclads turned also, keeping bows on to their van, the *Chen Yuen* preserving her station and distance from the flag-ship, as indeed she continued to do throughout the battle. The Japanese willingly bear witness that the two ironclads preserved their formation, and that the *Chen Yuen* by her movements and gun practice covered the *Ting Yuen* when in straits, and in fact prevented the fleet from suffering annihilation instead of its actual heavy loss. The Principal Squadron now seemed to ignore the four smaller Chinese vessels, and its five ships steamed around our two ironclads, pouring in a storm of shell. Time and again fires broke out, but, with one notable exception, the flames were subdued without much trouble. Some of the enemy's ships used melinite shells, the noxious fumes from which could at once be distinguished from those of powder. One ship, for a time, practised "broadside firing by director" — *i. e.*, each gun is laid by its crew on the object, and the entire battery, joined in one electric circuit, is fired by pressing a key. This system, though doubtless hard on the structure of the ship using it, was most effective, — the result of so many shot striking at once, and producing perhaps several fires, being very annoying.



FROM A PHOTOGRAPH TAKEN AT PORT ARTHUR.
STERN OF THE "LAI YUEN," SHOWING DAMAGES FROM FIRE, ETC.



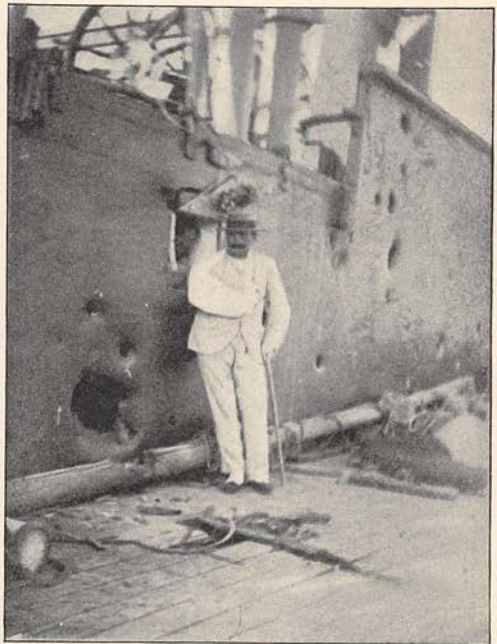
FROM A PHOTOGRAPH.

THE "CHEN YUEN" IN DOCK AT PORT ARTHUR THE DAY AFTER THE BATTLE.

During the confusion of our line consequent upon being out-maneuvered, the *Chih Yuen* passed under our stern and joined the *Lai Yuen* and surviving ships of the right wing. The *Ping Yuen* and *Kwang Ping*, now coming up, threatened the *Akagi* and *Saikio*. Signals were made on the *Matsushima*, and the Flying Squadron maneuvered to cover the endangered vessels. About this time the *Chih Yuen* boldly, if somewhat foolhardily, bore down on the Flying Squadron's line, possibly to attack the two mentioned vessels. Just what happened no one seems to know, but apparently she was struck below the water-line by a heavy shell — either a ten-inch or a thirteen-inch. Be that as it may, she took a heavy list, and, thus fatally injured, her commander, Tang Shi Chang, a most courageous albeit somewhat obstinate officer, resolved at least to avenge himself, and charged one of the largest vessels, intending to ram. A hurricane of projectiles from both heavy and machine guns swept down upon his ship, the list became more pronounced, and just before getting home to his intended victim his ship rolled over and then plunged, bows first, into the depths, righting herself as she sank, her screws whirling in the air (as did the *Victoria's*), and carrying down all hands, including the chief engineer, Mr. Purvis, a gentleman and a most efficient officer, who was shut up in the engine-room. Seven of her crew clung to one of the circular life-buoys kept on the bridge, and were drifted by the tide toward the coast, where they were rescued by a junk. The stories of these men vary so much in general as to be unreliable, but all agree on one incident. Captain Tang had a large dog of a most vicious temper, unruly at times even with his master. After the ship sank Captain Tang, who could not swim, managed

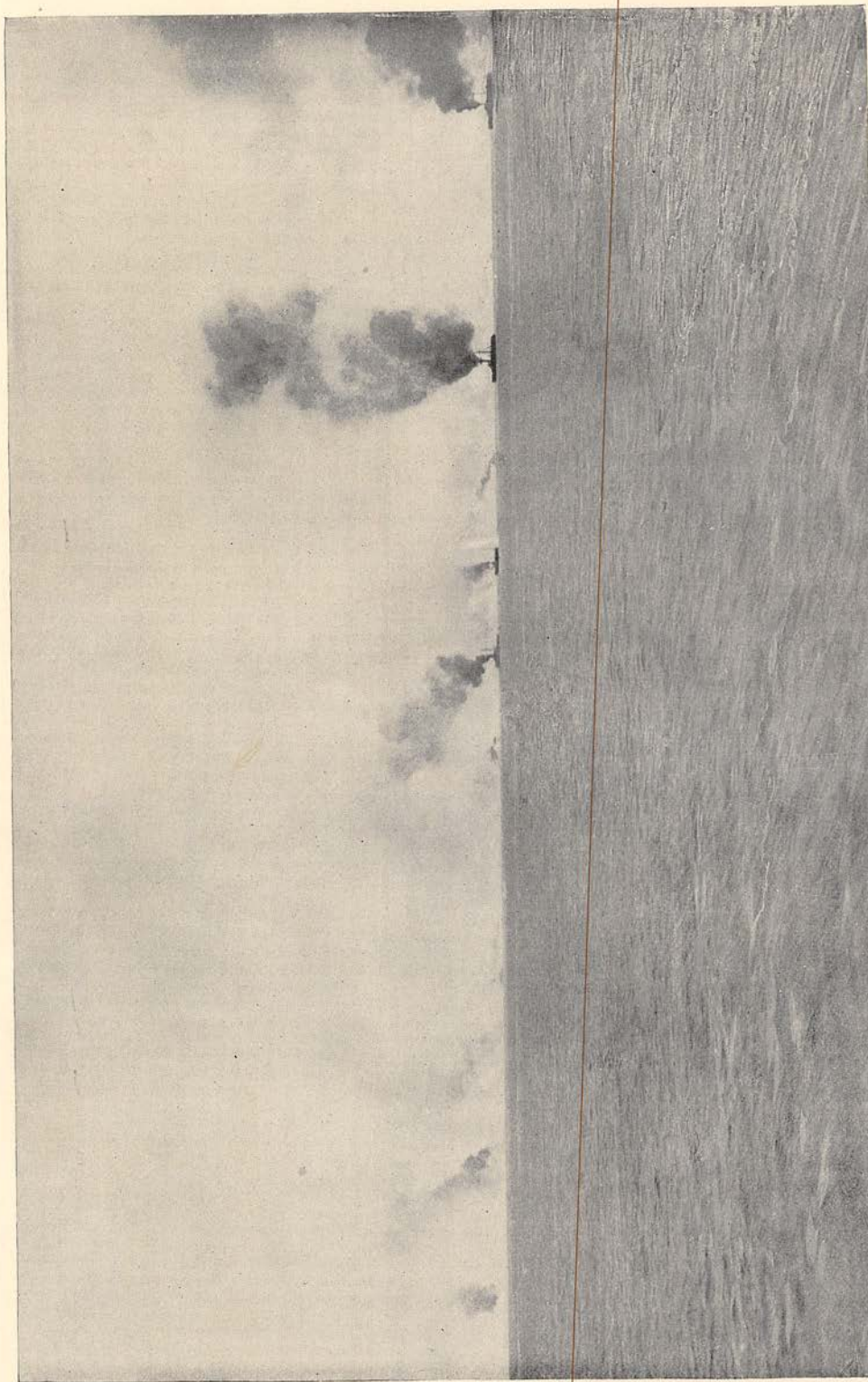
to get to an oar or some small piece of wood — enough to have supported him had not his dog swum to him, and, climbing up on him, forced him to release his grasp and thus miserably drown, the brute sharing his fate — perhaps the only case on record of a man drowned by his dog.

As the Principal Squadron circled around us, the range varied from 2800 meters (nearly two miles) to perhaps 1000, at times even less. At about three o'clock the *Matsushima* closed upon the *Chen Yuen* to about 1700 meters,



FROM A PHOTOGRAPH TAKEN AT PORT ARTHUR.

SUPERSTRUCTURE OF THE "CHEN YUEN," SHOWING DAMAGE.



FROM A PHOTOGRAPH BY AN OFFICER OF THE "SAIKIO MARU."
THE BATTLE OF THE YALU, SEPTEMBER 17, 1894, AS IT APPEARED FROM THE "SAIKIO MARU," AT FOUR MINUTES TO ONE O'CLOCK P. M.

and we fired at her, from one of our 12.2-inch guns, a steel shell of 5 calibers' (5×12.2 inches) length, having a bursting-charge of nearly ninety pounds of powder. The Japanese flagship was struck by this missile, and as a burst of flame arose from her, followed by a great cloud of white smoke, hiding her entirely from view, our gun's crew yelled their satisfaction. This shell indeed wrought frightful havoc. From the Japanese report it totally disabled the big 13-inch Canet gun and swept the decks. Several charges of powder for this gun had been massed on deck, and these, exploding, gave the gunners a true "hoist with their own petard." By this one shell forty-nine officers and men were instantly killed, and over fifty wounded; the gunnery lieutenant was blown into the sea, his cap and telescope being all trace of him ever found on the ship.

Soon afterward the Principal Squadron withdrew toward the southeast, seemingly having had enough of fighting. Our two ironclads followed them, firing. When they had gone a distance of two or three miles the Principal Squadron turned, and, circling about us, poured in perhaps the most destructive fire we received during the day. We had now used up all of our 6-inch ammunition, having fired 148 projectiles of that caliber. There were left for the 12-inch guns (one of which was disabled) only some 25 steel shot, and no shell. The *Ting Yuen* was in a similar plight. In half an hour we would have none left, and be at the mercy of the enemy; for to ram agile, well-handled ships of $17\frac{1}{2}$ knots' speed with our slower ships was out of the question. We fired carefully, but having no shell, comparatively little damage was done. It was now nearly five o'clock. After about a half-hour's cannonade the enemy again withdrew, we firing our last shot at them, save three left in the guns for the last moment. This withdrawal at about 5:30 p. m. has always been a mystery. It would seem that the Japanese could scarcely help noting that our bow and stern 6-inch guns were silent, and that our fire was slowly delivered from the barbettes. Had they stayed with us a quarter of an hour more, our guns would have been silent and the ships defenseless. The enemy apparently were not in want of ammunition, as their firing up to the last had been animated.

We now turned back and gathered up the surviving ships of the fleet. These vessels had fared badly at the hands of the Flying Squadron. After covering the *Saikio*, *Hiyei*, and *Akagi*, the van bore down on the *King Yuen*, which had been burning for some time, and the *Yoshino* with her next astern engaged the *King Yuen* at close range (less than 2000 meters). A heavy fire from the *Yoshino's* three 6-inch

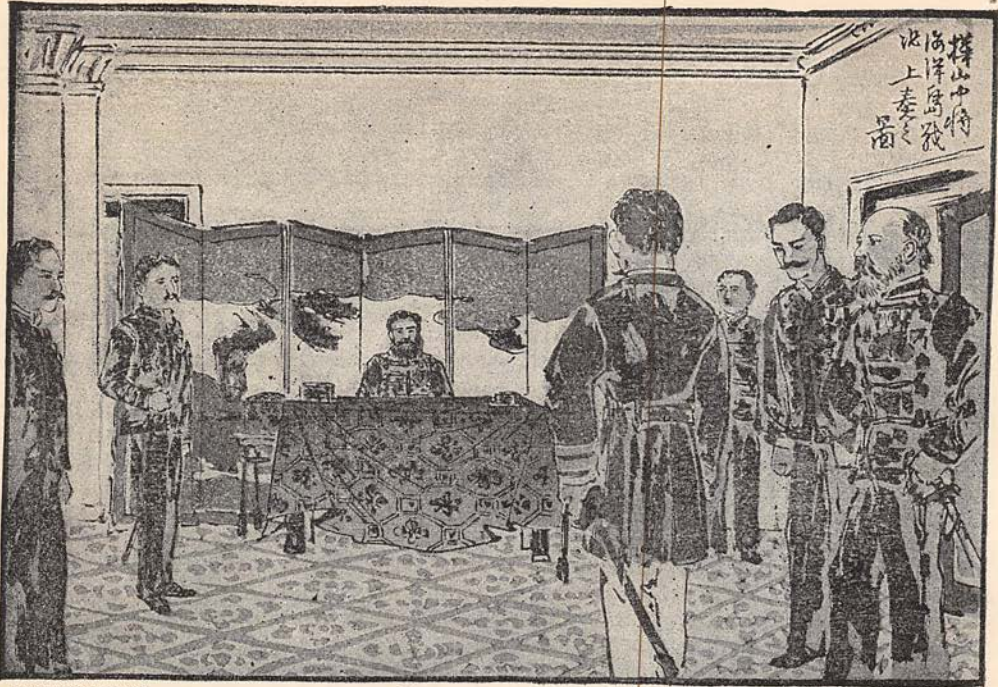
quick-firing bow guns told upon her with terrible effect. One after another of the 100-pound shells tore up her sides, and after yawing about wildly, as if her steering-gear was useless, she burst into flame and sank.

During this time the three crippled Japanese vessels had withdrawn toward Ping Yang. After the sinking of the *King Yuen*, the Flying Squadron were recalled by signal from the Principal Squadron, else the *Lai Yuen* and others could hardly have escaped destruction, since the ironclads, having no more ammunition, could not have succeeded them. As the sun was setting the *Ting Yuen*, with the battered *Chen Yuen*, the *Lai Yuen* (still desperately fighting the flames that threatened to devour her), the *Ching Yuen*, *Ping Yuen*, and *Kwang Ping*, set course for Port Arthur. As darkness set in the flames from the still burning *Chao Yung* showed luridly across the moonlit sea. The Japanese Principal Squadron of five vessels kept in sight on our port beam until darkness set in, but made no effort to reengage. In fact, both fleets had fought themselves to a standstill.

The question is often asked, Why did the Japanese win? I reply, because the Japanese had better ships, more of them, better and larger supplies of ammunition, better officers, and as good men. As to the practice, it was on both sides bad; but, as the Japanese have admitted, the Chinese excelled. The Japanese percentage of hits (excluding 6-pounder and lighter projectiles) was about twelve; the Chinese perhaps twenty. But the latter had only three quick-firing guns in action—viz., the *Kwang Ping's* 50-pounders. An enormous number of projectiles could have been fired by the enemy. It must not be forgotten that the Japanese had twelve ships against our eight, as the *Tsi Yuen* and *Kwan Chia* ran away almost without having fired a shot, while the *Chao Yung* and *Yang Wei* were in flames before they had time to do much more.

Admitting freely and heartily the courage of the Japanese crews and the dash of their commanders, I must also say a word for the despised Chinese sailor. The Japanese stood to their guns throughout; but their decks were not almost continuously swept by a storm of missiles, as were those of the Chinese. Had they been, it would have made no difference, I am sure. But owing to our paucity of ships and guns, especially quick-firing guns, they were not often so tried; while on the two ironclads, at least, a shower of missiles searched the upper works almost continuously, yet the men fought on, as a few incidents will show.

The captain of one of the 12-inch guns, while training or laying it, lanyard in hand, had his head dashed off, its fragments striking



FROM A JAPANESE PRINT.

ADMIRAL KABOYAMA'S ANNOUNCEMENT TO THE MIKADO OF THE VICTORY OF THE YALU.

those about him. As he toppled over, a man on the step below caught his body around the waist, passed it down into the arms of those below, and, catching the lanyard from his stiffening grasp, took his place, corrected the aim, and fired.

A brother of the *Chen Yuen's* gunnery lieutenant, a mere lad, had been taken by his brother on board for this cruise, as a change from his home at Wei-Hai-Wei. When the action began the lad took up a station on the barbette, in rear of the guns, eagerly taking the sponge or rammer from the men using them, and passing them back as required, making himself generally useful in whatever way his small body permitted. When his brother (Lieutenant Tsao Kai Cheong) was wounded, he helped pass him below, and after seeing him bandaged up returned to his work till the fight was over. Wonderful to say, he escaped without a scratch, being probably the only un wounded one of those who had been in the barbette from the first.

About the middle of the fight the *Lai Yuen* caught fire aft, and burned fiercely. The broad-side guns could not be manned, being surrounded by flames; but the bow guns were worked steadily, while the crew persistently fought the flames on the quarter-deck. Below, in the engine-rooms, with the ventilators stopped on account of fire overhead, and, in darkness, receiving orders only by voice-tube transmitted

from the deck through the stoke-hole, the engineers stood to their duty, hour after hour, in a temperature bordering on 200°. After several hours the fire was extinguished; but these brave men were in several cases blinded for life, and in every instance horribly burned and disfigured. There was no surgeon on board, and until Port Arthur was reached they suffered terribly. Many such incidents could be cited did space permit.

When the *Chen Yuen* was desperately on fire in the forecastle, and a call was made for volunteers to accompany an officer to extinguish it, although the gun fire from three Japanese ships was sweeping the place in question, men responded heartily, and went to what seemed to them almost certain death. Not one came back unscathed. No, these men were not cowards. There were cowards present, as there have been on every battlefield; but here, as elsewhere, there were brave men to detest them.

The battle being over, there was time to look about, and indeed the ships were found to be in a sorry plight. On the *Chen Yuen* there had long been no sign of life in the military foretop, where five men and an officer had been stationed, the former to work the two 1-pounder Hotchkiss guns, and the latter to find the enemy's range. Two gaping holes in the top gave an ominous meaning to the silence, and on investigation it was found that

a shell had penetrated and had killed every one of the six.

A curious accident saved the crew of the bow 6-inch Krupp gun. Twenty-four rounds had been fired when, upon opening the breech to load for the twenty-fifth, the guard-chain that prevents the breech-block from coming all the way out became unhooked and the steel block was pulled out and fell on the side of the carriage, breaking a locking-screw and totally disabling the gun. The crew, their occupation gone, came into the barbette and asked for orders. They were needed to fill vacancies at the 12-inch guns, and were at once stationed. Scarcely had they reached the barbette when a 10-inch shell entered beneath the gun which they had just left, and, exploding, rattled fragments about inside the shield like dice in a box. Afterward other shell penetrated and burst in the shield. Had the crew been there, not one would have escaped.

It is safe to say that the damage done to the Japanese vessels far exceeded their statements of it. As they patched up their vessels as well and speedily as they could, putting painted canvas over shot-holes, and wisely avoided the exhibition to foreigners of their most serious injuries, the relative amount of damage is misunderstood. The Chinese, on the other hand, from the first allowed many visitors to examine and visit their ships while at Port Arthur under repairs. For weeks the ships lay in the steam-basin, each gun dressed with a band or scarf of red bunting around its muzzle (a ceremony having some religious significance), all but the craven *Tsi Yuen*, which lay in the western basin, apart from all the others, in disgrace.

The Japanese claim a victory at the Yalu, and with justice. But with the going down of the sun on that day seemed to disappear the *élan* with which they broke our formation in the early afternoon. As has been said, no attempt was made to renew the battle during the night. Four of the torpedo-boats, which (from the reports of the Japanese) seemed such a bugbear to them, never left the river; and it is hard to believe that so dashing a commander as Admiral Ito would have allowed the two boats with us to frighten him. They say that, imagining us to be bound for Wei-Hai-Wei, they kept, as they considered, a parallel course, intending to renew battle and oppose our entering the harbor in the morning. But why, in the name of common sense, should we have gone to Wei-Hai-Wei, which is over eighty miles farther than Port Arthur, and had no docking facilities, nor any place where ships could be repaired, save a small yard for trifling damages, while Port Arthur, on the other hand, possessed ample facilities for repair, and

abundant stores? Moreover, the course we steered—direct for Port Arthur, even before dark—should have indicated to the enemy our destination. Perhaps they were in little better condition for fighting than ourselves. The next morning a Japanese squadron from Ping Yang, which probably had not been in the battle of the day before, reconnoitered the field of battle, and, like a kick administered to a dead animal, exploded a torpedo against the stranded, fire-gutted wreck of what had been the *Yang Wei*. No attempt whatever was made on the transports, the four gunboats, and the four torpedo-boats up the river, which, some five days later, arrived safe at Port Arthur and Taku.

As may be imagined, a study of the battle teems with lessons to the naval architect and the seaman. It established the value of high-power rapid-firing guns of 4.7-inch caliber and upward, and the destructive effect of shells with large bursters. The value of quick-firing guns smaller than the 3-pounder is questionable, little if any damage being done by such guns. In the opinion of the writer, they have no place on any ship of war except torpedo-vessels.

On the other hand, with regard to the ships' defensive armament, superiority may be claimed for the Chinese ironclads. These vessels were struck both on the 14-inch belt and the 10-inch conning-tower by dozens of armor-piercing projectiles from the enemy's 13-inch Canet guns (for which thirty inches of penetration is claimed), as well as from their 10-inch Armstrong guns and from smaller guns, but not a single shot penetrated more than four inches. With this success for thick armor comes the failure of minor steel protection. The gunshields and conning-towers of one and two inches of steel were simply man-traps. As I have said, by removing the shields from the heavy guns on the two ironclads many lives were saved. At 3000 meters' range, on July 25, the *Tsi Yuen's* conning-tower was pierced from side to side by a 4.7-inch projectile, shattering its inmates into a shapeless mass. The need of a protection of four inches at least, or none, would seem to be the lesson taught.

The important part played by fire in this action is well known. The convenient disposition and protection of fire hose in battle are shown to be imperative. On the *Chen Yuen* the ship's life was several times saved by the fact that the lines of hose were coupled up and the fire-pumps were working continually. Thus ready, our fires were extinguished, as a rule, before they had attained large proportions, which, in action, they do in a marvelously short time. Every line of hose, however, was cut by shot through and through before the close of the battle.

Another question introduced by our experiences is, What should be the situation of the

conning-tower? Between, rising above, and dominating the two barbets in which lay the ship's main battery, that on the *Chen Yuen* was struck by many projectiles, which, breaking up or bursting, rebounded into the gun-pits in a deadly shower. Two thirds of the casualties at these guns were caused by rebounding missiles.

From the beginning nearly all the signal-halyards were shot or burned away. The *Chen Yuen's* were nearly all gone, and she entered Port Arthur next day with a small riddled ensign flying from the starboard signal yard-arm on the foremast. There should be an armored place for signalmen in full view of the conning-tower, from which signal-numbers could be shown, chalked on a slate for example; and its signal-halyards should be rove up part of the way through the steel mast.

There has been considerable misapprehension of the part taken in this engagement by torpedo-boats. The *Foo Lung*, the larger of the two torpedo-boats which took part in the action, was commanded by Captain Choy, a gallant and capable officer, educated in America. According to his report the *Foo Lung*, following the *Ping Yuen*, *Kwang Ping*, and *Tso Yih* into action, came up with the *Kwang Ping* a little after two. Captain Choy says:

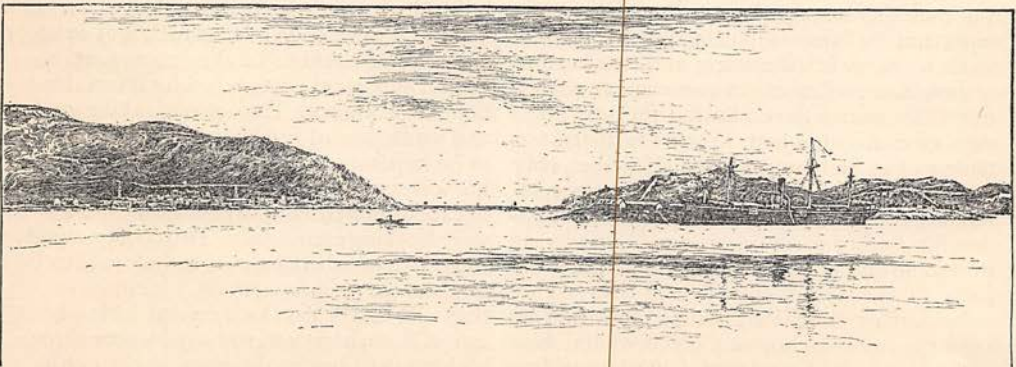
Five of the Japanese were seen going in line ahead, being hotly engaged with our *Ting Yuen* and *Chen Yuen*. . . . They were five or six miles from us. Other clouds of smoke were seen farther to the westward. . . . We then made for the Japanese ships which separated us from our fleet, and when about 3000 yards off the *Ping Yuen* opened fire, . . . and seemed to hit one of the larger Japanese ships. . . . Presently the *Kwang Ping* opened fire also. . . . At this time the *Chen Yuen* hit a Japanese ship, which was immediately covered with white smoke, and could not be seen afterward. She was burning all ablaze. . . . At this time a Japanese armed transport was seen ahead, cutting across our bow,

and seemed to be heading for one of our ships [the *Yang Wei*] which was ashore, burning W.S.W. of Ta Lu Tau. The *Kwang Ping* opened fire. The transport replied to the fire. The *Foo Lung* then steered direct toward the transport, . . . and at about 400 yards one torpedo was fired at her, but it deviated toward the right, the Japanese also steering to avoid the missile. . . . A second torpedo was fired, and passed her side about fifteen feet. . . . The Hotchkiss guns and Gatling guns were fired at her, she firing at us at the same time, . . . all the shots passing over our heads. . . . We ported the helm and passed her on our port side about thirty or fifty yards off, and fired the broadside torpedo at her, but it passed under her. She then steered southward, trying to join the Japanese fleet. It was now between 3:30 and 4:00 P. M.

All the *Foo Lung's* torpedoes were now fired. The probable explanation of the firing under the *Saikio's* bottom is that the torpedo-boat listed over in answering her helm, thereby pointing the broadside torpedo downward. The *Tso Yih* had also tried to use her torpedoes, but leaked so that it was easy for the enemy to avoid her.

China's fleet is now a thing of the past, and many gallant men have perished with it, striving vainly to save their country's credit, with fate against them, and handicapped by corruption, treachery, and incompetence on shore. Chief among those who have died for their country is Admiral Ting Ju Chang, a gallant soldier and true gentleman. Betrayed by his countrymen, fighting against odds, almost his last official act was to stipulate for the lives of his officers and men. His own he scorned to save, well knowing that his ungrateful country would prove less merciful than his honorable foe. Bitter, indeed, must have been the reflections of the old wounded hero, in that midnight hour, as he drank the poisoned cup that was to give him rest.

Philo N. McGiffin.



DRAWN BY ALEXANDER SCHILLING, FROM A PHOTOGRAPH.

ENTRANCE TO PORT ARTHUR, FROM THE HARBOR.

LESSONS FROM THE YALU FIGHT.

COMMENTS ON COMMANDER MCGIFFIN'S ARTICLE¹ BY THE AUTHOR OF "INFLUENCE OF SEA POWER UPON HISTORY."



COMMANDER MCGIFFIN is to be congratulated upon being one of the first, if not the very first, of naval officers belonging to the nations of European civilization, not only to undergo the dangers and experiences of a naval action under modern conditions, but also to tell what he has seen and felt in a manner at once instructive and suggestive. The remarks that follow are an attempt to develop somewhat further, along the line of thought of one person, the inferences that may be drawn from his story.

1. It appears that although the Chinese government permitted the fleet to cruise freely to the westward of a line drawn from the Yalu River to Shantung lighthouse, they positively forbade the admiral to go to the eastward, thereby depriving him of the power to bring the Japanese to action if, from the information he might receive, a fair opportunity offered. Admiral Ting's views in this matter seem to have been contrary to those of his superior on shore. In the absence of full information a decisive judgment would be improper; but it seems likely that we have here one of the commonest and most deplorable experiences of war — the hands of a commander-in-chief, present on the scene of operations, tied by the positive instructions of a man, or set of men, at a distance. How often the Aulic Council ruined the Austrian armies, how much more often it neutralized their efficiency by the unavoidable slowness consequent upon having to refer continually to Vienna for instructions, is one of the commonplaces of military history. It is inevitable and necessary that the armies and navies should be subordinate to the general war policy of the civil government; but the latter should beware of too particular directions, and, above all, of absolute orders, fettering the discretion of the commander-in-chief. If the man *on the spot* cannot be trusted, he should be removed; but no one at a distance from the scene of operations can effectively direct them.

2. The experiences with the gun-shields on July 25, as well as in the Yalu fight of September 17, are extremely suggestive, and from my point of view should be taken in connection with another fact which has seemed to make

¹ See page 585.

the deepest impression on the professional mind, not only of naval officers, but of civilians who have made a special study of naval matters — namely, the great effect of rapid-fire guns. Speaking broadly, the gun-shield represents the defensive element, the rapid-fire gun the offensive. Both ideas, of course, are necessary, and in a sense complementary each of the other; but not only does the unvarying voice of military history assign superiority to the offensive, but Commander McGiffin gives reason to think that the gun-shield, unless of unusual thickness, — perhaps even then, — is a source rather of increased injury than of defense. The reason, as far as he goes in this, is simple enough: a single projectile that might clear everything and every one but for the shield, and that at the worst would probably strike only a single man, is by the shield converted into several projectiles which can scarcely miss all round, not to speak of the shock caused by the explosion to those who escape being hit. Most modern shells, it should be explained, do not burst unless they meet a fairly solid resistance.

Regarding the contrast of ideas expressed respectively by the gun-shield and the rapid-fire guns, I have long been inclined to think that Admiral Farragut's pregnant phrase, "The best defense against the enemy is a well-directed fire from our own guns," was almost a prophecy to our present times, though the rapid-fire gun now so called was not even dimly foreshadowed in his day: but in truth his words simply expressed tersely a great undying principle as applied to the situation then before him. Offense is better than defense. A war-ship is vulnerable in two chief respects — in her motive power and in her personnel. It is imaginable that one might be wholly neutralized without materially injuring the other. The question, not only of to-day, but of a century's standing, is, Which is it better to attack in order to subdue the ship? In olden days the British habitually attacked the personnel, the French the motive power, and each was consistent; for the aim of the former was to insure decisive results, and that of the latter to avoid them. Each has had its advocates, and consequently there is something to be said on each side; but upon the whole it is, I think, fair to say that experience replies, Attack the men. And the reason is

much the same as a hundred years ago: not only is it impossible to have the men as well protected as the motive power, but the destruction of the men who handle the offensive powers of the ship makes the motive power practically useless. Now the weight which a ship of given size can carry is limited, and must be distributed among several objects, of which gun-power is one; and the question has to be met, How shall this gun-power be subdivided among the different classes of gun? If your aim is the motive power, you want heavy guns; for the motive power — the engines and boilers — are given the utmost possible protection, by position, by the thickest armor, by the coal stowage, the protective deck, and so on, to pierce which great force is required. But heavy guns mean few guns, and few guns mean few shots, and few shots mean fewer hits; while of those that hit, if they strike the protective system of the engines, etc., fewer still penetrate, a truth long foreseen, yet very generally dropped out of sight, and which the Yalu battle has singularly confirmed. On the other hand, the weight of armor required to protect the water-line adequately makes it impossible to extend by similar means adequate protection to the battery spaces, except only those occupied by the heavy guns; and even where these are adequately protected, — impervious, that is, to the missiles from those lighter guns technically called "rapid-fire," — there can be no question that their accuracy of fire is singularly embarrassed. For that reason it is sought to aim and fire them from an exterior position — the conning-tower,¹ for instance — a plan of which it is enough here to say that, except for the heaviest guns, it is tending to fall into disuse. Considering the vast importance of securing the best practice from the heavy guns, — for I am not at all arguing against them, only against their excessive number, — it becomes necessary to beat down and keep down all the other fire of the enemy. If success in this is attained, a distinct and immense advantage is gained for the heavy guns over those of the enemy; for, if the rapid-fire guns which have established their ascendancy cannot penetrate the turrets, they can greatly annoy the men in them, and may enter the gun-ports. This superiority, if maintained, must result in victory. It has long seemed to me that the mutual relations of the heavy and rapid-fire guns of a ship have a strong analogy to a field battery of artillery and its infantry supports, the latter of which at once protect and secure the efficient service of the former. However that may be, the rapid-fire gun of moderate caliber has just now fairly established its position as the greatest offensive power in naval warfare.

3. Rapidity of fire for guns of all kinds is a question partly of the size and mechanism of the gun, but still more of supply. The ammunition storage of a ship is, for obvious reasons, buried as deep under water as possible, and it is both an important and intricate matter so to proportion supply to demand as to make no needless exposure of such dangerous material *in transitu* or on deck — not, in short, to be hoist with your own petard. It appears from Commander McGiffin's narrative that both Chinese and Japanese were led, by design or accident, to accumulate projectiles and ammunition on deck in advance of immediate demands — a practice greatly deprecated. But is the deprecation wholly sound? Offense is better than defense. Rapid fire with some risk is better than slower fire with no risk — risk, that is, from this particular source — because the slower fire yields to the enemy an advantage greater than the risk avoided. On board a foreign battle-ship, not long ago, the captain said to me that in providing for action they accumulated a certain number of rounds — ten, I think — near each rapid-fire gun. "Don't you consider that a great risk?" I asked. "Undoubtedly," he replied; "but not so great a risk as that the enemy should fire faster than we." I think he was right. Collingwood used to tell his crew that if they could fire three well-aimed broadsides in as many minutes, no enemy could resist them. Farragut noted with emphatic commendation, in 1839, when the French attacked the castle of San Juan de Ulua at Vera Cruz, that they habitually kept a great number of shot accumulated in racks on deck — a practice many naval officers still remember. The introduction of shells — explosive projectiles — gave pause to this habit, for direful experiences had taught that a shot, solid or hollow, striking one would explode many near by. Nevertheless, the difficulty of insuring rapid supply at any time, even the quietest, and the dreadful liability to severance of the chain of supply by the casualties of battle, suggest the imperative necessity of an accumulation. This should be so planned and so proportioned to the rate of fire possible to the gun as to insure the minimum of risk that must be taken if the full efficiency of the battery is to be maintained. Especially is this necessary for the beginning of an action — usually, at least as regards the single ship, the most pregnant of the final result.

4. The manner in which the battle was fought — the tactics, to use the correct technical word — presents some points of interest. It is to be regretted that we have not with more precision the ideas which underran the distri-

¹ "To con" is to direct the steering.

bution of the forces of either admiral; but the various accounts made public are so far in agreement as to show authoritatively, within certain limits, what was done, though not the reasons for doing it.

It will be observed, assuming Commander McGiffin's figures, that the possible speed of the Japanese fleet, according to the accepted maxim that the speed of a fleet is that of the slowest ship, was about three knots in excess of that which the Chinese could show. The figures would be, approximately, seventeen and fourteen. The Japanese *Akagi*, *Hiyei*, and *Fuso*, of twelve and thirteen knots, scarcely invalidate this statement, as they were weak ships, except the *Fuso*, and the first two dropped behind and were disabled. This superiority would encourage the Japanese admiral to attempt the manœuver—to me somewhat inexplicable—of steaming in column from left to right across the front of the Chinese line. He had the speed to do it; otherwise, to present the flank of his ships to the oncoming prows of the enemy would have been a reckless undertaking, as was exemplified by the mischance of the slow *Hiyei*, which failed to get across, its captain, to avoid consequent destruction, having turned and passed between the two Chinese ironclads—a deed, be it said in passing, that showed a promptness of decision and a daring which well deserve the praise bestowed by Commander McGiffin. But the same consideration—the danger of being rammed—forced the Japanese to pass a long way ahead of the Chinese,—three thousand yards (if I remember right; McGiffin does not say),—and to deliver their fire at that range, which I do not think naval professional opinion would generally approve. The first blow is half the battle, and should, if practicable, be more closely delivered.

The Chinese admiral, in reducing the speed of his fleet to six knots, its actual rate of steaming, had accepted the defensive rôle—awaited attack. In his disposition for defense (if the result of deliberation) he had to consider that there are three weak points of a line, the center and the two flanks. If the center is pierced, the force is divided; but the center can be more easily reinforced than either flank can be. Owing to the want of homogeneity in his ships, the problem was perplexing, but the natural solution was the one adopted; namely, to keep the two battle-ships together and to place them in the center. Having done this, however, I think that if it was intended to fight in the order assumed, the next strongest ships, the two armored cruisers, should have been placed on each flank; and immediately in rear of each of them should have followed one of the ships standing third in the order of strength, thus forming a flanking column of two. To file past

the flank of a line of ships, as the Japanese did, is an old incident of naval warfare, sometimes accidental, as in Rodney's battle of 1782, sometimes intentional, as it always was when a line was intentionally broken by an enemy. If the line be single, the flank ship is alone, and receives, unsupported, the fire of all the enemy that pass by. If another ship be placed in her rear, they support each other; and if there be three or four, the enemy's attempt loses much of its danger. All of which goes to show that, upon the whole, a column of ships is a better defensive formation than a line, as the broadsides of the ships cover their flanks and they move up to each other's support.

Having passed the Chinese front, the Japanese filed by the right flank; and this is why, failing other light than I have, I find the manœuver of passing the front inexplicable. Considerable risk of casualty was thereby run merely to concentrate fire in the end on the right flank, when the left flank could, apparently, equally well have been attacked without the previous punishment, whatever that might amount to. Nor would the slow rear ships have been exposed to the mischance of the *Hiyei*. This comment, however, as well as that upon the Chinese dispositions, is confessedly made upon partial information, and may also be open to the proverbial retort that hindsight is always better than foresight.

After the first collision between the enemies, the Chinese order was soon lost, whereas the Japanese retained control of their own throughout. This advantage they seem to have utilized in a manner at once judicious, spirited, and skilful. Dividing their force, they separated the two hostile battle-ships from their consorts; and holding the latter in check with a light division, they concentrated upon the two their five heaviest ships, circling round them swiftly, and pouring in the fire of their numerous rapid-fire guns. Such an attack searched every open or weak point in the enemy's harness. The number of shots, and the consequent number of hits, told everywhere; and while the heavy guns failed utterly to get through the armor to the motive power, the personnel suffered grievously in efficiency, if not by wounds. Of this the proof is that only one 12-inch projectile from the Chinese fleet got in seriously upon the Japanese, while the terrible effect produced by that one showed how complete might have been the victory of the Chinese had their gunners been able to fire with full judgment and sight; having, as they had, five enemy's ships only partly protected, in close line, among which to choose. How the Japanese small projectiles found their way everywhere is also indicated by the fact cited by Commander McGiffin that the captain of one

of the 12-inch guns, which had the maximum of protection, was killed.

As regards systems, the result of this episode is a drawn battle, which may be summed up broadly as the successful resistance of two ships, armored, with a joint displacement of 15,000 tons, to five ships, partly protected, of 19,000 tons. This, as far as it goes, favors the view that a given amount of tonnage in one or in a few big ships possesses a decided advantage over the same, or even a greater amount, divided among several. This view is also in strict accord with the general teachings of warfare, that force concentrated under one command is more efficient than that disseminated among several. This conclusion must not, of course, be pressed to absurdity, but tempered, as all practical conclusions are, by moderation and discretion. A man may consider one 10,000-ton ship better than two of 6000 without wanting one of 20,000 tons at all, for sufficient reasons. Our forerunners found a 74-gun ship absolutely superior to two frigates,—for the latter to attack was considered folly,—yet the seventy-four was their norm for the battle-ship, and only exceptionally was exceeded in size.

On the other hand, this episode was a drawn fight because forty-five (more or less) quick-firing guns got the better of eight 12-inch guns unsupported by any quick-firing guns at all. They did so, I apprehend, because they destroyed the personnel of the ship, either directly or by shattering its power of efficient offense. Men, however brave, cannot stand up against fire of a certain intensity; and when such a condition is reached and sustained, they are as good as dead for the time being.

I make all these inferences broadly, neither ignoring nor wishing to ignore the existence of qualifying circumstances, which, however, only qualify, do not reverse, the conclusions reached. I have, for instance, not taken into account the Japanese heavy guns, of which there were three 13-inch, and twenty-seven of calibers varying from 5 to 9 inches. These certainly must have counted for something; but as, on the one hand, this increase of the Japanese power reinforces my argument that force in two big ships is better than if distributed in five, so, on the

other hand, it goes to show that heavy guns, slowly manipulated, are inferior to rapid-fire guns in effect against personnel. Directed against the vitals of the ship herself, they failed to penetrate. They represent the attack on motive power, as the rapid-fire guns represent that on personnel.

In itself, and considered simply as a naval engagement, the Japanese victory of the Yalu appears to me inconclusive. The failure to press at once the advantage obtained may be accounted for in more ways than one, not in the least discreditable to the Japanese; but the comparative losses, and the insignificance of the Chinese vessels sunk, coupled with the fact that the engagement was not renewed, would indicate that their gallant and skilful admiral felt it was expedient to retire. The subsequent demoralization of the Chinese left to their enemies the control of the sea, which was decisive of the war, but which the Yalu fight alone would not have conferred.

In conclusion, the failure of the heavy projectiles to penetrate the Chinese armor which they struck, while it strengthens the argument of those who favor the battle-ship as the chief constituent of naval force, deserves the close attention of all persons, lay as well as naval, who are perplexed by the alternate crowing of both parties in the wearisome contest between guns and armor. The result shows, as most of us could have foreseen had we stopped to think, that armor is actually a far better protection than is indicated by the trials of the testing-ground, where, for purposes of extreme proof, all the off chances are given to the gun. On the trial ground the victory of the gun has, with occasional fluctuations of opinion, been generally taken as proved; in the Yalu fight the armor, thanks to the operation of causes carefully excluded in testing, came out ahead when it was struck.

In considering these various questions, I have tried, as far as possible, not to regard them merely as particular unrelated cases, but to treat them as illustrations of general principles, operative formerly as well as now, and which were exemplified by the history and practice of the past as really as they are by these modern instances.

A. T. Mahan.

