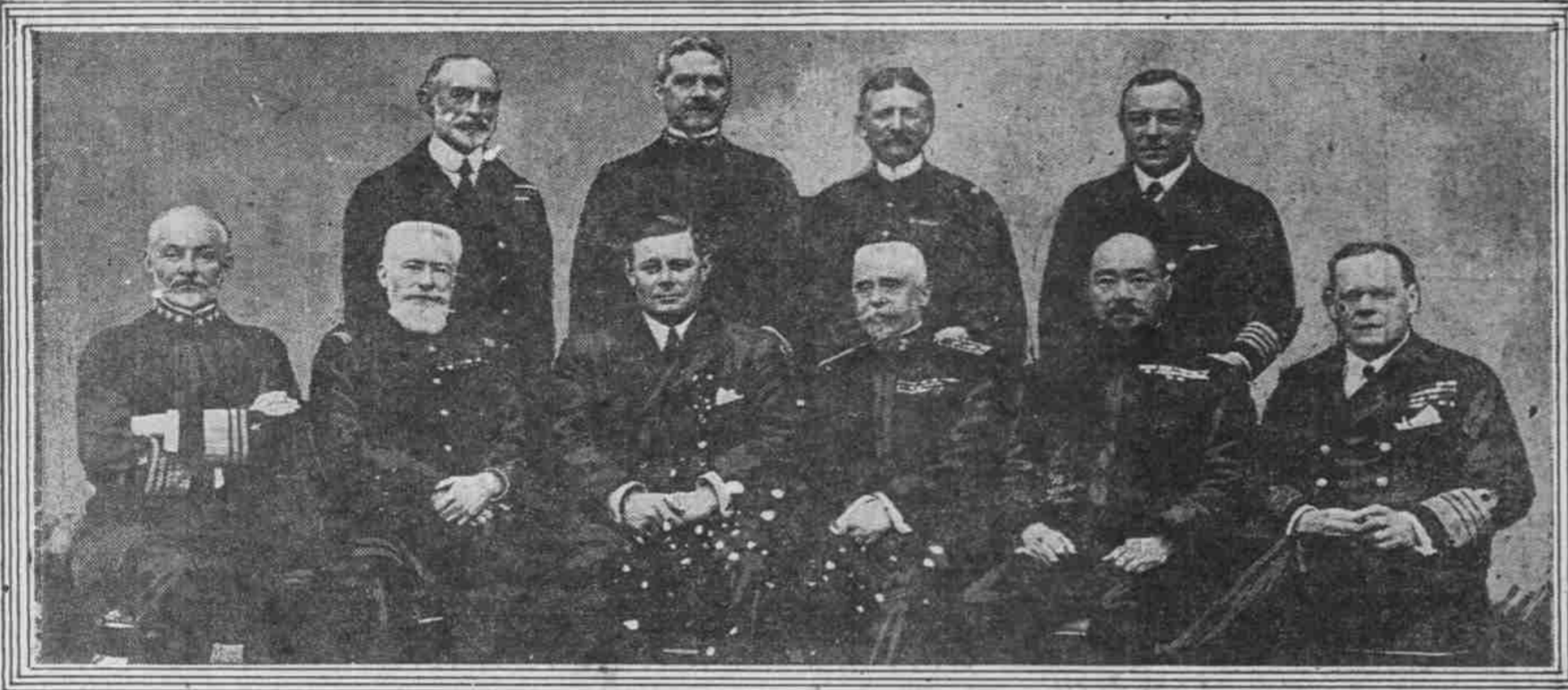


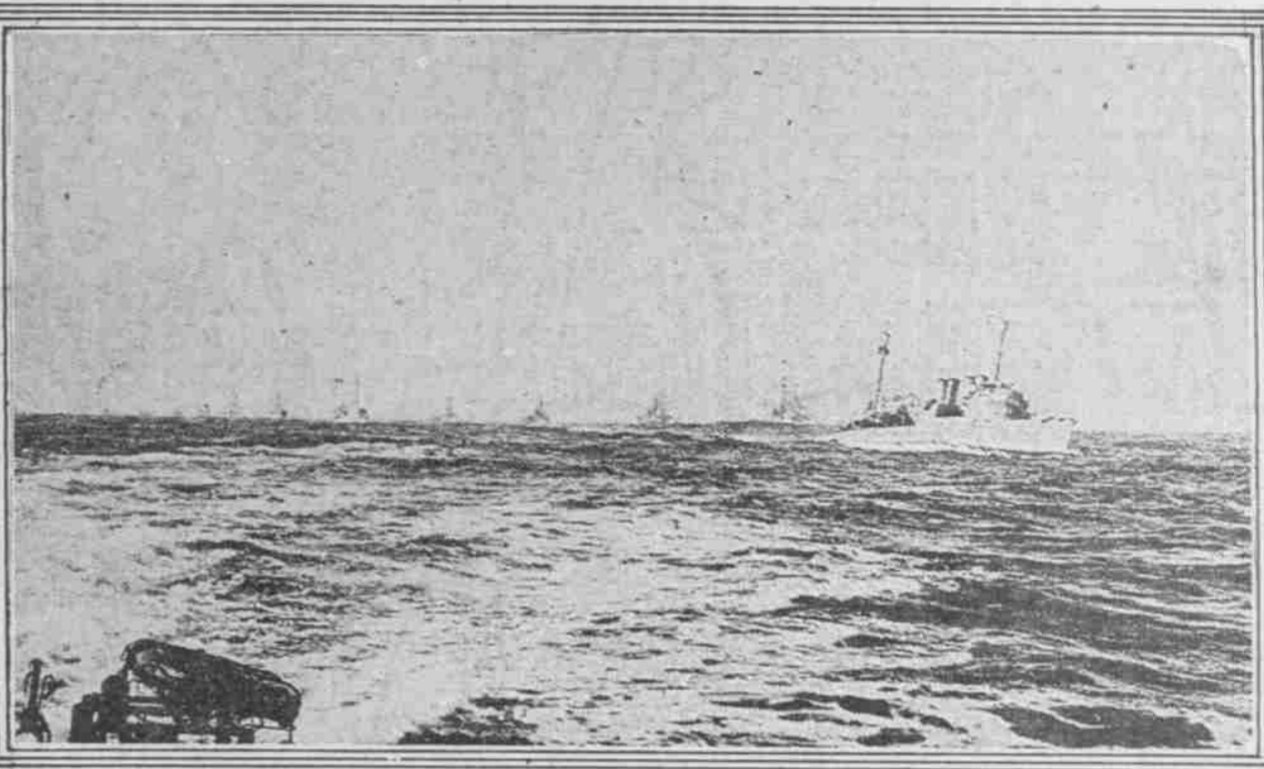
THE VICTORY AT SEA

DEVELOPING THE CONVOY IDEA

By Admiral William Sowden Sims



Allied Naval War College Which Met At Paris To Determine Plans For Coordinating The Efforts Of The Allies.



American Battleship Fleet With Destroyers Acting As Screen.

HAVING constantly before my eyes a picture of the fleet immune from torpedo attack, naturally the first question I asked when discussing the situation with Admiral Jellicoe and others was this: "Why not apply this same principle to merchant ships?"

If destroyers could keep the submarines away from battleships, they could certainly keep them away from merchantmen. It is clear, from the description already given, precisely how the battleships had been made safe from submarines: they had proceeded, as usual, in a close formation, their "convoy," and their destroyer screen had proved effective. Thus logic apparently indicated that the convoy system was the "answer" to the submarine.

Yet the convoy, as used in previous wars, differed materially from any application of the idea, which could possibly be made to the present contest. This scheme of sailing vessels in groups, and escorting them by warships, is almost as old as naval warfare itself. As early as the 13th century, the merchants of the Hanseatic league were compelled to sail their ships in convoys as a protection against the pirates who were then constantly lurking in the Baltic sea. The government of Venice used this same device to protect its enormous commerce. In the 15th century the large trade in wool and wine between England and the Moorish ports of Spain was safeguarded by convoys, and in the 16th century Spain herself regularly depended upon massing its ships to defend its commerce with the West Indies against the piratical attacks of English and French adventurers. The escorts provided for these "flotas" really laid the foundation of the mighty Spanish fleet which threatened England's existence for more than a hundred years. By the time of Queen Elizabeth, the convoy had thus become the all-prevailing method of safeguarding merchant shipping, but it was in the Napoleonic wars that it reached its greatest usefulness. The convoys of that period were managed with some military precision; there were carefully stipulated methods of collecting the ships, of meeting the cruiser escorts at the appointed rendezvous, and of dispersing them when the danger zone was passed; and naval officers were systematically put in charge. The convoys of this period were very large; from 200 to 300 ships were not an unusual gathering, and sometimes 500 or more would get together at certain important times, such as the entrance to the Baltic. But these ships, of course, were very small, compared with those of the present time. It was only necessary to supply such aggregations of vessels with enough protecting cruisers to overwhelm any raiders which the enemy might send against them. The merchantmen were not required to sail in any particular formation, nor were they required to maneuver against unseen mysterious foes. Neither was it absolutely essential that they should keep constantly together; they could even spread themselves some what loosely over the ocean. If an enemy raider appeared on the horizon, the escorting cruiser or cruisers left the convoy and began chase; a battle ensued, the convoy meanwhile passing on its voyage unharmed. When its protecting vessels had disposed of the attackers, they reformed the merchantmen. No unusual seamanship was demanded of the merchant captains, for the whole responsibility for their safety rested with the escorting cruisers.

spot. This mere fact shows that zig-zagging in itself was one of the best methods of avoiding destruction. Before it became the general practice the task of torpedoing a vessel was comparatively easy. All the submarine had to do was to bring the vessel's mast in line with its periscope directly ahead of her, submerge with the small periscope showing only occasionally, and fire her torpedo at short range as the ship passed by. Except in the case of very slow vessels, she could of course do this only when she was not far from the course of her advancing prey when she first sighted her. If, however, the vessel was zig-zagging, this pretty game was usually defeated; the submarine never knew in what direction to go in order to get within torpedoing distance, and she could not go very far because her speed under water is so slow. The same conditions apply to a zig-zagging convoy. This explained why, as soon as the merchant vessel or convoy entered the submarine zone, or as soon as a submarine was sighted, it began zig-zagging, first on one side and then on the other, and always irregularly, its course comprising a disjointed line, which made it a mere chance whether the submarine could get into a position from which to fire with any certainty of obtaining results. A vessel sailing alone could maneuver in this way without much difficulty, but it is apparent that 20 or 30 vessels, sailing in close formation, would not find the operation a simple one. And it was necessary for them to sail in close and regular formation in order to make it possible to maneuver them and screen them by destroyers; it is evident that the closer the formation the fewer the destroyers that would be needed to protect it. These circumstances make the modern convoy quite a different affair from the happy-go-lucky proceeding of the Napoleonic era.

Merchant Captains Did Not Like Convoy. It is perhaps not surprising that the greatest hostility to the convoys has always come from the captains themselves. In old days they chafed at the time consumed in assembling the ships, at the necessity for slower speed to enable the less speedy vessels to keep up with the procession, and at the delay in getting their cargoes into port. In all wars in which convoys have been used it has been very difficult to keep the merchant captains in line. In Nelson's day these fine old salts were constantly breaking away from their convoys and taking their chances of running into port unescorted. If the merchant master of a century ago rebelled at the comparatively simple managed convoys of those days it is not strange that their descendants of the present time should not have looked with favor upon the relatively complicated and difficult arrangement required of them in this war, and in the earlier discussions with these men at the admiralty it is not surprising that they were almost unanimously opposed to the convoy.

The merchantmen themselves are the chief obstacles to the convoys, said Admiral Jellicoe. "We have discussed it with them many times and they declare that it is impossible. It is all right for war vessels to maneuver in close formation, they say, for we are on time practicing in these formations, and they think that it is second nature to us. But they say that they cannot do it. They practically reject the idea that when in formation they can maneuver their ships in the fog or at night without lights. They believe that they would look not safely upon the convoys, but they are not so sure as they say. I was told that the whole subject had been completely threshed out at a meeting which had been held at the admiralty on February 23, 1917, about six weeks before America had entered the war. At that time ten masters of merchant ships met Admiral Jellicoe and other members of the admiralty and has discussed the convoy proposition at length. In laying the matter before these experienced seamen, Admiral Jellicoe emphasized the necessity of good station-keeping, and he described in close formation which the vessels would have to maintain. It would be necessary for the ships to keep to-



Capt Twining, U.S. Chief of Staff to Admiral Sims.

gether, he explained, otherwise the submarines could pick off the stragglers. He asked the masters whether it would be possible for eight merchant ships, with a speed which varied perhaps two knots, to keep station in line ahead (that is, in single file or column) 500 yards apart, and sail in two columns down the Channel. "It would be absolutely impossible," the ten masters replied, almost in a chorus.

Lack of Trained Merchant Captains. A discouraging fact, they said, was that many of the ablest merchant captains had gone into the navy and that many of those who had replaced them could not be depended on to handle their ships in such a formation. "We have so few competent deck officers that the captain would have to be on the bridge the whole twenty-four hours," they said, and the difficulty was not only with the bridge, but with the engine room. In order to keep the ships constantly the same distance apart it would be necessary accurately to regulate their speed; the battleships could do this because they had certain elaborate devices for timing the revolutions of the engines which the merchant vessels lacked. The poor quality of the coal which they were obtaining would also make it difficult to maintain a regular speed. Admiral Jellicoe then asked the masters whether they could sail in two or three and keep station. "Two might do it, but three would be too many," was the discouraging verdict. But the masters were positive that even two merchantmen could not safely keep station abreast in the night time without lights; two such vessels would have to sail in single file, the leading ship showing a stern light. The masters emphasized their conviction that they preferred to sail alone, each ship for itself, and to let each one take its chances of getting into port. Difficulty in Overcoming Opposition. And there the matter rested. I had the opportunity of discussing the convoy system with several merchant captains, and in these discussions they simply echoed the views which had been expressed at this formal conference. I do not believe that British naval officers came in contact with a single merchant master

who favored the convoy at that time. They were not doubtful about the idea; they were openly hostile. The British merchant captains are a magnificent body of seamen; their first thought was to serve their country and the allied cause; their attitude in this matter was not obstinacy; it simply resulted from their sincere conviction that the convoy system would entail greater shipping losses than were then being inflicted by the German submarines. Many naval officers at that time shared this same view. They opposed the convoy not only on these grounds; its introduction would mean immediately cutting down the tonnage 15 or 20 per cent, because of the time which would be consumed in assembling the ships and awaiting escorts and in the slower average speed which they could make; many ship owners and directors of steamship companies expressed the same opinions. They also objected to the convoy on the ground that it would cause considerable delay and hence loss of earnings. Yet the attitude of the merchant marine had not entirely eliminated the convoy from consideration. At the time it arrived the proposal was still being discussed; the rate at which the Germans were sinking merchantmen made this inevitable. And there seemed to be two schools among allied naval men—ones opposed to the convoy, and the other advocating it. I had a practical trial. The convoy had one irresistible attraction for the officer expert which seemed to counterbalance all the objections which were urged against it. Its adoption would mean taking the offensive against the German submarines. The essential defect of the patrol system, as it was then conducted, was that it was primarily a defensive measure. Each destroyer cruised around in an assigned area, ready to assist vessels in distress, escort ships through her own "square" and, incidentally, attack other craft whenever opportunity offered. But the mere fact that a destroyer was patrolling a particular area meant only, as already explained, that the submarine had occasionally to sink out of sight until she had passed by. Consequently the submarine proceeded at the rate of 10 or 12 knots, as fast as it was not in sight, and this was necessarily most of the time, for the submarine zone was such a big place and the

allied destroyer fleet was so pitifully small that it was impossible to cover it effectively. Under these conditions there were very few encounters between destroyers and submarines, at least in the waters south and west of Ireland, for the submarines took all precautions against getting close enough to be sighted by the destroyers.

Yet the British and French navies were not the only ones which at this time were depending upon the patrol as a protection against the submarine. The American navy was committing the same error on our Atlantic coast. As soon as a congress declared war against Germany we expected that at least a few of the U-boats would cross the Atlantic and attack American shipping; indeed, many believed that some of them had already crossed in anticipation of war; the papers were filled with silly stories about "submarine bases" in Mexican waters, on the New England coast and elsewhere; submarines were even reported entering Long Island sound; nets were stretched across the Narrows to keep them out of New York harbor; and our coasting vessels saw periscopes and the wakes of torpedoes everywhere from Maine to Florida. So prevalent was this apprehension that, in the early days of the war, American destroyers regularly patrolled our coast looking for these far-flying submarines. Yet the idea of seeking them in this way was absurd. Even had we known where the submarine was located there would have been little likelihood that we

could ever have sighted it, to say nothing of getting near it. Suppose that we had learned that a German U-boat was operating off Cape Cod; we might have had the exact latitude and longitude where she was expected to be at a particular moment. At the time the message was sent the submarine might have been lying on the surface ready to attack a passing merchantman, but even under these conditions the destroyer could never have reached her quarry, for, as soon as the U-boat saw the enemy approaching, she would simply have ducked under the water and remained there in perfect safety. When all danger was passed she would have bobbed up to the surface as serenely as you please, and gone ahead with her appointed task of sinking merchant ships. One of the astonishing things about this war was that many of the naval officers of all countries did not seem to understand, until a very late date, how utterly futile it was to send anti-submarine surface craft out into the wide ocean to attack or chase away submarines. The thing to do, of course, was to make the submarines come to the anti-submarine craft and fight in order to get merchantmen.

I have made this point before, and I now repeat the explanation to emphasize that the patrol system was necessarily unsuccessful, because it made almost impossible any combats with submarines and afforded very little protection to shipping. The advantage of the convoy system, as its advocates now urged, was precisely that it made such combats inevitable.

In other words, it meant offensive warfare. It was proposed to surround each convoy with a protecting screen of destroyers, precisely as in the case of the battle fleet. Any submarine which attempted to torpedo a convoyed ship could therefore do so only in waters that were infested with destroyers. In order to get into position to discharge its missile the submarine would have to creep up close to the rim that marked the circle of these destroyers. Just as soon as the torpedo started on its course and the telltale wake appeared on the surface the protecting ships would immediately begin sowing the waters with their death charges. Thus the Germans would have to fight for every ship which they attempted to sink, instead of sinking them conveniently in waters that were free of destroyers, as had hitherto been their privilege. The great advantage of sailing ships through waters that were completely protected by destroyers had been shown in the immune zone which had been established across the channel from Dover to Calais and from Folkestone to Boulogne. By arranging ships in compact convoys and protecting them with destroyers we would really create another immune zone of this kind, only it would be a movable one. We should establish, say, a square mile of the surface of the ocean in which submarines could not operate without great danger, and then we would move that square mile along until port was reached.

(Another article by Admiral Sims next Sunday.)

UNIQUE PHOTOGRAPHIC DEVICE RECORDS WIRELESS MESSAGES ON PRINTED TAPE

Marvelous Electrical Invention Makes Great Advance Over Present Practice—Greater Speed, Accuracy and a Permanent Record of Each Message Features of New York Engineer's Discovery.

A NEW marvel in connection with wireless has come about and it plays a big part in it. By this method, invented by C. A. Hoxie, an electrical engineer of Schenectady, N. Y., wireless messages can be received and recorded at a far greater speed and with further assurance of accuracy than has heretofore been possible.

For some time Uncle Sam's naval engineers at Otter Cliffs receiving station near Bar Harbor, Me., as a matter of daily routine, have been receiving and recording wireless messages by this new photographic method with perfect success.

The invention permits the eye to either supplement or replace the ear in reading wireless messages. In fact, a totally deaf man could be a wireless receiving operator in a station so equipped.

Other results are: Greater speed in receiving; greater accuracy in deciphering, and a permanent record of every dot and dash in every message so received. Because of the very delicate tuning that can be obtained, and the resulting high degree of "selectivity," it has been found practicable to receive messages despite many inductive noises and interfering signals which ordinarily have rendered reception impossible. Although the instrument is not immune from the effects of "static strays," it has successfully recorded messages at high speed regardless of strong static interference.

Without its aid, would have baffled the receiving operator.

It is stated that messages have been deciphered with its assistance when operators were unable to get a single word of it by ear alone. Thus, the outstanding obstacles to accuracy in wireless receiving have been eliminated, except for severe static interference.

The photographic receiver and its permanent record is a guard against error, and will settle disputes, for its visual record of a message in dots and dashes distinctly shows to the eye what was received. A photographic print of this type is of unquestionable accuracy.

As to speed in receiving, this machine has frequently recorded at the rate of 40 words per minute, as fast as a machine gun shoots, and recently, in a test made by Mr. Hoxie, the machine recorded a low power mes-

sage at 600 words per minute. Up to this time the most rapid method of recording radio signals has been by the phonograph, but this must still be transcribed by the ear and not the eye. Moreover, no permanent visual record is made. The photographic method has never yet approached the rate of 600 words per minute, so the new instrument has hung up a new speed record. An interesting sidelight on this feature of the invention is that high speed messages are secret messages to all who are not equipped with this device.

A commercial phase of the speed question is peculiarly linked up with the atmospheric-electric phenomena of the northern temperate zone. For years it has been found that the best time for transmitting all wireless messages between here and Europe was from 4 A. M. to 10 A. M. Speedy sending and receiving can coincide the traffic into this most favorable period, or a greater volume can be sent with a minimum number of stations. When it is remembered that a pair of stations—one in Europe and one here—can easily cost \$2,000,000—the item of keeping down overhead charges by rapid sending will be easily appreciated.

Expert operators have been known to receive 35 words per minute for a short time under perfect conditions, but average reception up to this time has been 15 to 20 words per minute, or 1000 words per hour.

It has been a race between sending and receiving speeds. Prior to this invention, it has been possible to send faster than it could be received, but now the situation has been reversed.

Photographic recorder in daily operation at Bar Harbor has repeatedly recorded regular traffic schedules ranging from 1000 to 7000 words without interruption, and at a speed of 40 to 55 words per minute every word is perfect and easily and quickly read. It is used supplementary to the ordinary type of receiving set.

And even more than this—an audible reception can also be made simultaneously by the regular telephone method. Heretofore there has been no visible record to refer to in case any doubt arises as to the accuracy of the interpretation of the message from distant shores. Some European stations repeat each word in every message.

The mechanism is based on a comparatively simple electrical engineering principle. A lightweight mirror "flutters" in electro-magnetic time with the minute electric impulses coming from the receiving antenna. The duration and extent of the mirror's oscillations vary according to the dot, dash or silence of the sending station. This mirror reflects a beam of light on the moving sensitized tape. This tape, propelled by an electric motor, progresses up and down through the vertical slit which contain the developing and fixing chemicals.

Automatically the tape enters the developing fluid and then the hypo fixing bath; then it is washed in running water, and is dried by electric heat assisted by forced draft—all invisibly effected inside this single machine. Like the tape from a stock-ticker, the message pours out of the wonderful device and into a basket. In regard to receiving, there is an average of one word for every inch of tape. The receiving operators can read the record at a speed of 50 to 100 words per minute.

The time to record, develop, fix, wash and dry the tape is from two to five minutes. The rolls of tape are 1000 feet long and a continuous message of 10,000 words can be recorded without reloading the machine.

Silver Plentiful in Yukon. DAWSON, Y. T.—Silver, "the white hope of the Yukon," as it has been called, has been found in such quantities in this northern territory that it is believed sooner or later large deposits will be found to replace the decreasing yields of gold and copper. Silver has been found in several places in the Yukon territory, particularly at Mayo, Twelve-Mile, Sixty-Mile, up the Hootlangu river, and in the southern Yukon valley. All the reports of silver strikes indicate, it is said, that the silver is scattered over an area of thousands of square miles.