

# The Submarine as a Preventative of War; England Was Near to Defeat by U-Boats

Written for This Newspaper by GLAUCUS, an Officer of High Rank on the Active List of the United States Navy.

*The cutting of lines of communication by water to England by the submarine not only threatened the civil population of England itself but also the British Army in France. Its success would have forced England, the army and an invincible fleet to ask for terms from Germany or else starve.*

WHEN in those dark days of 1917, just after the United States entered the war, and when only those in high places knew of the almost hopeless plight of England, and of the "panic" into which the British Admiralty had been thrown over a solution to the vital question of how to fight the submarine peril, we, nearly three thousand miles from the seat of war, raised our voices and asked, "Where is the much vaunted fleet of England, why does it not free her of this marine octopus which is throttling the very life out of that proud mistress of the seas?"

How many of us even now realize the terrible danger of that hour to England? And how many of us realize that the submarine as a weapon was not defeated but that the personnel of the German navy succumbed to a breaking down of its morale, which acted to make ineffective the value of that weapon?

Geographically and economically England was unfortunately situated to defend itself against submarine operations. Economically England was dependent upon shipping which came to a focus both on entering and leaving the British Isles. Submarine warfare against England naturally operated to cut this flow of necessities to England and the outward flow of "bottoms" from England. For this purpose a concentration of submarine activities at the several foci was instituted. These foci are stationary localities known to every seafaring man.

England's great battle ship and cruiser fleet could not fight the submarine any more than a bulldog can fight a salmon. The submarine will not stay and fight. Furthermore it is more than foolhardy for a big ship to remain in the vicinity of a submarine submerged, because the big ship cannot harm the submarine, as it cannot tell its location, and the big ship is helpless to avoid a torpedo when fired at short range.

## Her First Weak Answer.

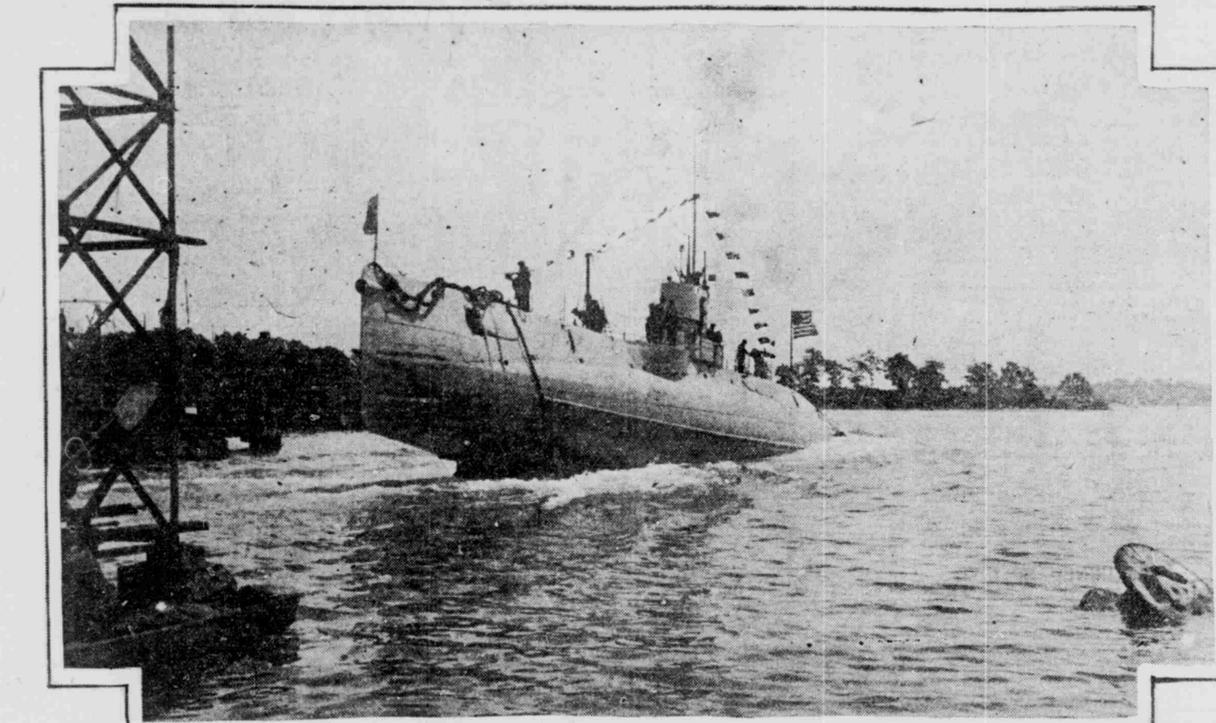
So battle ships and cruisers, the monarchs of the sea, are helpless before the submarine in the same way that a prize fighter is helpless before a burglar with his automatic pistol drawn. The prize fighter cannot dodge a bullet.

England's reply was characteristic of her past sea strategy developed through countless years of controlling the sea highways—a concentration of warships to fight the submarine at the foci of trade routes, but this method, although it had brought success to England in the past, did not do so in this case and the reason was that "an enemy which fights in the open can be met and defeated by superior surface force, but one that lurks in the depths of the sea cannot be subdued by those familiar means, but must be met by a new and more up to date method of attack."

The consequence was that England in attempting to apply the old principle of concentration of force against the submarine found herself, after several months of effort, face to face with failure and her population and army faced with starvation, and all because the Admiralty was attempting to apply a well known principle in the old way without appreciating that, although the principle was applicable, yet the method of its application was wrong, owing to the changed characteristics of its enemy.

All know now that the submarine menace was held in check and England did not starve, yet how many of us realize that the submarine as a weapon could not have been defeated, for on the day of the armistice Germany owned a greater number of submarines of the most improved types than at any time since the declaration of war in August, 1914, and this after having lost by casualty nearly two hundred submarines during the four years of operation.

England finally held starvation at arm's length by a method long understood, but the Admiralty was very loath to use this



THE R-10, AMERICA'S NEWEST and GREATEST SUBMARINE, BEING LAUNCHED at QUINCY, MASS., Photo by I.F.S.

method and it was not until American counsel was added upon our joining the war that the Admiralty at last agreed to throw overboard the patrol system and adopt the convoy system.

The British Admiralty's principal objection to convoy was that there were not enough of the proper types of warships to guard the convoys and that therefore submarines could concentrate and slaughter ships in convoy as wolves in a flock of sheep. This reason seemed sound to the British mind, but it was not, for the reason that the number of guards required was not as great as at first thought, and they soon found that many of the patrol war ships could be dispensed with and used to guard convoys. The convoy system required careful planning to prevent contacts at sea at night or in fogs, but after all merchantmen were in convoy, the risk of collision at sea was much less, for convoys travelling in one direction were given routes clear of those in another direction.

## Adopts the Convoy System.

The underlying principle of the convoy system may be explained by saying that it "brought the mountain to Mahomet." Before its adoption England permitted about twenty-five hundred cargo ships to arrive singly into her ports and about the same number to depart singly. This made a procession of ships passing and re-passing over the same narrow sea routes. What a wonderful chance for the submarine!

To protect this never ending procession small patrol vessels of many types had been scattered over these narrow waters and their duty had been to attack the submarine when sighted. Insufficient numbers of patrols permitted ships to be torpedoed by the score weekly, while the patrol boats arrived only in time to rescue the crews after the ships had disappeared beneath the waves. The patrol method was wasted effort, yet the Admiralty held to this method until forced by outside opinion to abandon it.

The convoy system collected all merchant ships into a compact body which was given a larger number of small war ships to guard it until well out on the high seas away from the narrow waters where the submarine lurked. There the convoy was disbanded to go to the several destinations. This did not involve great risk, for the seas were wide. The convoys made up in the United States and other countries sailed in these compact formations until arrival in ports of England or France and through the narrow waters were given escorts of patrol boats. Now the kernel of the case was this:—When a submarine torpedoed a ship in convoy it had to do so in sight of one or more patrol boats, therefore the patrol

boats were given the opportunity to attack the submarine, which they all along desired. Furthermore, the submarine had been using its guns upon merchant ships singly, but to do this upon a ship in convoy now brought the submarine to the surface and in contact with the guarding patrols close by.

True, submarines still took their toll upon merchant ships, but under greatly increasing dangers to themselves. The convoy system forced the submarines to come to the patrol boats because they remained with the submarine's intended victims. To avoid the patrols the submarines naturally would have had to avoid attacking the merchantmen which were the objects of their work.

## The Submarine's Power.

It has been ever more or less a mystery to the American naval men why the German submarine did not carry out its threat against our transport convoys. As is well known, large convoys of American troops entered the ports of Brest and St. Nazaire weekly, and during the months of May, June and July, 1918, even more often. This must have been known to the German Admiralty, yet no real concentrated attack ever was made. These great convoys, containing often as many as fifteen large transports with a total in convoy of 40,000 men, were seldom molested. From the United States to the neighborhood of the Azores practically no anti-submarine escort was furnished, but the ocean is wide and it was consequently difficult for the submarine to plan to intercept the convoys.

From about longitude 20 west to the French ports of debarkation numerous destroyer escorts were furnished the convoys. Here was the submarine's opportunity, yet he seldom grasped it. The reason is the same—the personnel did not have the sand to attack in the presence of so many vigilant American destroyers. They preferred less hazardous work and attacked merchant convoys only where destroyer escort was small in comparison to the large number of ships collected into one convoy. The German submarine officers, even as early as the spring of 1918, felt that the morale of their crews was not equal to attacks upon well escorted American troop convoys.

As a weapon the submarine was not vanquished. The result again proves Napoleon's formula that in war the personnel is the material as three to one. Germany's personnel suffered a break of morale which took from the submarine warfare three-fourths of its sting.

This new method of keeping up her lines of communication did not give England the victory over the submarine as a weapon,

but won the victory because of a yellow streak in the German character. While the German was torpedoing or sinking by gunfire the unescorted merchantman he was in no danger, for it was impossible for the few patrol boats to cover all the seas. It seemed therefore like play to the German. He was on the crest of the wave—winning—his morale was high. He saw the enemy's great ship sink without resistance. Should a patrol appear on the horizon, the submarine quietly passed from the insecurity of the surface to the more hospitable depths of the ocean, where no eye or ear could detect him.

## Playing the New Game.

But with the convoy system—Gott strafe the man who proposed it! The submarine had to manoeuvre cautiously among destroyers, submarine chasers, drifters, trawlers, etc., all armed with guns and depth charges, before it could fire its torpedo at a merchantman of the convoy, and must by so doing momentarily disclose its position to a patrol.

This was entirely different from the game the submarines had with so much joy been playing. There existed now a very strong element of danger to the submarine. Besides, it put the submarine always on the defensive. There was seldom an opportunity to practise the offensive. The long suspense which the personnel endured while attacking a convoy, when only one person knew what was going on outside, and that one the captain at the periscope, began to gradually tell on the men. After each return to Germany they blessed their stars to be back and dreaded the coming of the day when they must again take part in those long dreaded attacks, when any moment a depth charge might do for them. Many of their companions never returned, and this they could not help knowing. The vein of yellow began to grow, and when the victories on land by the Allies began to be understood by the German people, this yellow streak again widened and suddenly we were shown the pitiful sight of a nation fully equipped in material giving in on account of a collapse of the morale in its personnel—not only of the fighting men but of the nation behind them.

## Command of the Sea.

The German brain could not conceive of continuing the fight after their armies and navy were forced upon the defensive. It takes a finer courage to fight on the defensive than on the offensive, for on the offensive the spirit of man receives inspiration from the result of his attacks, while on the defensive "dogged does it," a trait of character not possessed by the German.

The term "command of the sea" is em-

ployed during a war to define the power of a belligerent to use the sea with reasonable security, denying its use to its enemy.

In all past wars previous to the great war the belligerent accomplished this "command" with surface war ships. Now airships and submarines, both instruments capable of disputing the command of the sea against surface war ships, have arrived to alter, not the principles involved but the method of their application.

Surface vessels in sufficient types and numbers can control the surface of the sea and can destroy all enemy vessels that must remain and fight in plain sight on the surface of the ocean. Surface vessels cannot conquer airships or submarines, for the very simple reason that they cannot catch them.

Airships must be attacked by airships. The principles underlying fighting in the air are the same as those applying to surface ships; in other words, a more formidable air fleet than the enemy is a necessity. But the submarine cannot be subdued in this way so easily, for the reason that underwater vision does not exist. Once the submarine leaves the surface it disappears from sight, and despite all pretences to the contrary, it cannot be heard with any degree of accuracy or even reliability.

## Weapon of the Weaker.

The submarine traverses the surface under one kind of motive power, the Diesel engine, and the most improved type can keep continuously in motion at about five or six knots until it has travelled ten thousand miles; that means a submarine can remain away from its base for about five months without refuelling. Under water, the submarine is driven by storage batteries through electric motors. The energy expended in running submerged is replaced by the Diesel engines charging the battery, the motors acting as electric generators.

In the hands of brave and determined men the submarine, when in numbers, becomes a very formidable opponent and one the surface vessel naturally dreads because it can never know when it may be blown suddenly to pieces by a torpedo fired at it by an unseen and unheralded foe.

Command of the sea permits the belligerent possessing it to continue its commercial activities by water across the sea highways. This assures the keeping open of communication with neutral nations reached only by water and insures obtaining the necessary material and money to continue the war.

The submarine is the weapon of the weaker belligerent. It cannot gain command of the sea against a great superiority of sur-

face war ships, but it can make such command precarious and possibly doubtful, as we have recently seen in the case of England.

A submarine cannot be blockaded in port as can a surface vessel. The very existence of enemy submarines on the ocean increases the distance between seaports by a factor of about ten per cent due to the necessity of zigzagging, thus increasing by that factor the fuel supply necessary.

With the full development of an offensive submarine such as Germany seemed on the high road to develop, no nation will be able to fully enjoy the command of the sea which its great surface fleet in days past would have assured.

The most approved method of attack upon a submarine consists of:—

(a) Locating the submarine when submerged by means of listening devices designed to make possible the hearing of a submarine's motive machinery at considerable distance away, say 2,000 yards, and locating its position by the intersection of two or more directing lines taken from as many listening vessels. As yet this is most difficult and but little success was achieved.

(b) After approximately locating the submarine's position under water, laying a depth charge barrage about this position. This method of destroying the submarine is likewise most difficult. When a depth charge explodes under water it exerts pressure of varying degrees within a cone whose apex is the charge and the base a circle on the surface of the water of size varying with the depth of the charge. The greater the depth the smaller the circle. The submarine to be damaged must have some part of its hull within this cone. If no part of the submarine is within this cone no pressure will be exerted upon the hull.

It will be seen, therefore, that a submarine, despite all popular claim to great vulnerability, cannot be destroyed so easily as we have been led to imagine. A vast number of surface vessels are required to account for a single submarine. Also the offensive and defensive battery of the most improved submarine permits it to rise to the surface and destroy its small pursuers.

## Submarine Force.

The United States bids fair to become a competitor for the carrying trade of the world. Its surface war fleet will never in all probability be sufficient to protect this great merchant fleet. In case of war, with a nation possessing a vastly superior navy the merchant ships of the United States must of consequence remain off the sea, while its enemy obtains the carrying trade sacrificed. If the greater sea power considers the dangers of the submarine perhaps it will hesitate to go to war against a nation with a formidable submarine fleet. That submarine fleet may thus become a most potent argument for the settlement of disputes by other means than war.

Attacks upon the enemy lines of communication are considered a most effective war measure for a belligerent to make. In future wars those vessels carrying contraband or troops must be considered legitimate objects of under water or above water attack by submarines. Therefore such vessels will be given the character of government vessels and will be virtually war ships armed with guns and manned by naval crews. The vessels of the enemy carrying only non-contraband or passengers and neutral ships must be searched and their character decided before attack. These questions will be decided doubtless by international law in connection with the use of submarines.

Germany attempted to write her own law on this subject, but it was so inhuman and wicked that the civilized world revolted against it. The submarine can fight only in its own way and a nation possessing a large submarine navy must see that this new law does not put too great a handicap upon the use of that weapon of defence.

The United States has a submarine fleet built or building of about one hundred and fifty effective vessels. The impetus of the war has provided the submarine bases and mother ships so vital to operate these vessels.

The prostration of the navy, due to recent legislation, by which the available enlisted force has been reduced to about fifty thousand men, has placed battle ships and many of our destroyers in a hopelessly crippled condition.

Dradnoughts in the fleets cannot muster more than forty to fifty per cent of their crews, while twenty-odd battle ships and armored cruisers are tied up at navy yards with scarcely ten per cent of their complements and at a time when the world is most unsettled.