

# SUBMARINES TO DRIVE BATTLESHIPS FROM SEAS



FLEET BOTTLED UP IN HARBOR BY SUBMARINES

O eminent authority as Admiral Sir Percy Scott of the British Navy declared the other day that the doom of the dreadnaught had been sounded by the development of submarines. He asserted unequivocally that even the superdreadnaughts were archaic and that experiments had proved conclusively that no fighting ship was safe from the attack of the submarine day or night. Why, then, spend millions for armorclad titans? he asked.

The pronouncement is the more impressive because Admiral Scott has probably done more than any other living naval man to make the battleship the offensive fighting machine it is today. By a system of director firing he improved the capability of making hits quite 100 per cent, and showed how a whole battery of monster rifles could be manipulated as a unit and the tremendous salvo brought to bear upon a distant target with amazing precision. In a word, he made the dreadnaught a wonderfully formidable instrument of attack, and yet today, in the face of that unparalleled record, he says: "I see no use for battleships."

There is in this country an authority of a kindred way of thinking, Simon Lake, who has done a great deal toward making the submarine what it is. In substance, Simon Lake anticipated Admiral Sir Percy Scott by many years in predicting the passing of the heavy ships of the battle line. He was asked the other day for his opinion of the British admiral's sweeping views.

"I still believe, as I always have, that the submarine will drive the heavy armored battleship from the seas," he replied, "and that it will be the means employed by all countries with a seaboard to prevent invasion from the sea."

"The partisan of the battleship points with reasonable pride to the spectacular performances of his giant turret guns, and he tells you of the many inches of hardened steel that the points of his armor-piercing projectiles can perforate. Truly these doings are little short of marvelous. But the advocate of the gun is a prejudiced expert withal, for he will not believe the torpedo to be a formidable rival. Why? Simply because generally he takes little interest in this order of weapon."

"But the torpedo is coming into its own. It is an instrument of precision and stupendous destructive might. Where it could not travel more than 1,800 yards with any chance of hitting the target a few years back, it can now cover a distance of 12,000 yards and make that run at an average of nearly 30 knots."

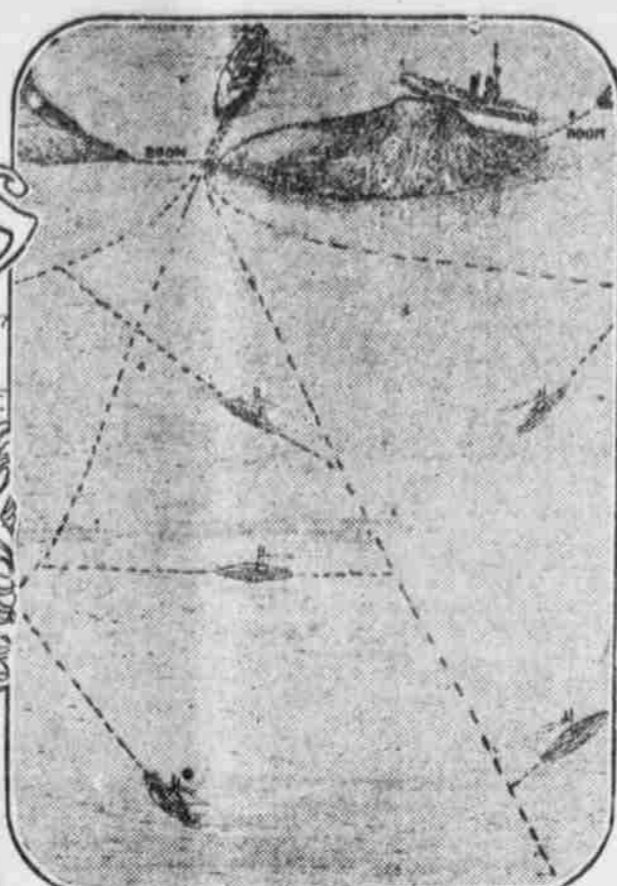
"In some particulars it is even more accurate than the gun. It travels far enough below the surface to be unaffected by the state of the sea. With its warhead charge of several hundred pounds of high explosive, attacking a ship where she is least prepared for assault, the detonation of that substance will cause a far greater wound than it is possible to produce with a number of the biggest projectiles."

"Yes, I think Sir Percy Scott is right, and his admission means much more because it comes from an expert who has heretofore favored the gun and the dreadnaught."

"What do I think of the submarines of the future? How big do I think they will be? Well, I have done some prophesying in the past and have been frankly pooh-poohed by the unbelievers, so you will understand my present reluctance to predict just how large submarines will eventually be built. There are mechanical problems that must be overcome first. The development of the submarine has not been as rapid as I anticipated, and this has been due to the difficulty of securing satisfactory engines."

"The gasoline engine has been somewhat discredited as a motor for underwater boats because of the explosive character of its fuel. We have had a number of distressing accidents due to the unexpected ignition of the fumes of gasoline. Yes, the heavy oil engine promises to meet the needs, but there has been a good deal of difficulty in securing a reliable heavy oil, reversible, internal combustion engine. Thanks to the genius of Dr. Rudolf Diesel, the way to success has been blazed, and as the heavy oil engine evolves the size and the speed of submarines will increase proportionately."

"As a matter of fact, we have already in mind



POSITION OF SUBMARINE'S OUTSIDE HARBOR

1894 and then launched, but she was not in the water more than a quarter of an hour when a sudden storm swept her ashore and damaged one of the wheels. When the spring of 1895 came I was face to face with something of a problem. The Argonaut, Jr., was at the bottom of 14 feet of water and partly buried in soft mud. My task was to refloat her and to make her ready for further experiments and for demonstrations looking to the interesting and very much needed capital. Now, regular diving suits are an expensive matter, and my funds were so extremely low that I had run around well nigh barefooted during the winter in order that every penny available could be used in connection with my embryo submarine.

"When milder weather came I had ready a diving dress of my own devising. For a helmet I utilized a framework of light iron rods covered with painted canvas and made it fit snugly over my shoulders and to strap under my arms. For a face plate I used the glass deadlight from the air port of an abandoned sloop, and to help me to submerge I tied sash weights to my legs. Common garden hose wound with wire served to carry my air supply from the surface. In this fashion I reached the Argonaut, Jr., closed her up and put in pipes to pump her out. In my anxiety to succeed I toiled under water for several hours, and in consequence spent the better part of a week in bed afterward. In that brief time I lost 40 pounds in weight, but I didn't mind that because the boat was afloat again."

"The Argonaut, Jr., was not designed to submerge deeper than 20 feet, and my main object in building her was to show how a craft of that nature could be made to travel around on the bottom and, by means of the diving compartment, make it possible to recover things lying upon the waterbed. To make a long story short, my performances were so successful that I obtained money and we organized a company in November of 1895. But we did not have funds enough to build the big boat I had planned, and accordingly we had to curtail our ambition and confine our efforts to a smaller craft for the purpose of demonstration and as an inducement to additional capital. Fortunately I won the confidence of the late William T. Maister of Baltimore, then president of the Columbian Iron works and afterward mayor of the town."

"The Argonaut was a cigar-shaped structure of steel, 36 feet long and 9 feet of beam, and was fitted with an 80 h. p. gasoline engine, a dynamo, an air compressor, a searchlight, water ballast pumps—the apparatus necessary for successful submarine navigation. She had accommodations inside her for a crew of five, and during 1898 a cruise of more than 2,000 miles was made in the Chesapeake bay and on the Atlantic coast, traveling both on the surface and submerged, and over all kinds of bottom. That boat, designed for commercial purposes, was the pioneer of a larger military underwater craft which we built in Bridgeport some years later."

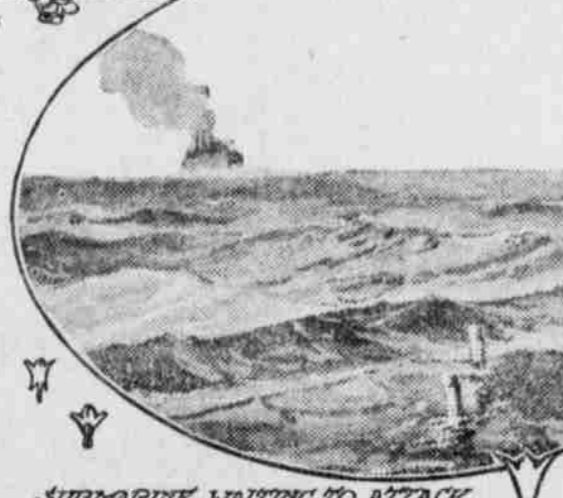
"As far back as 1901 I offered our navy department a boat that could carry guns in addition to torpedoes. I was generally laughed at, as I was for my bottom-traveling wheels. As you know, most of the big British submarines now carry guns and other nations are profiting by those examples. The big boats built by me in Russia for the czar's navy were designed to have this very feature."

"In view of the actual advances, and knowing the increasing destructive might of the torpedo, I find no difficulty in subscribing to Admiral Sir Percy Scott's prediction. Yes, of course, the idea is of revolutionary portent, but with the gun to batter her above water and the torpedo to do even greater damage below, what chance of surviving has the accepted order of dreadnaughts?"

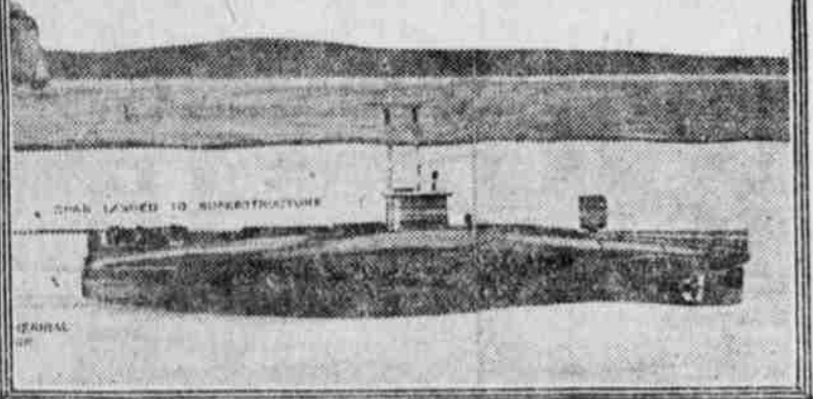
"The Proctor was the first underwater craft to provide comfortable quarters for her crew and to be equipped with cooking facilities in order that they might live aboard of her. Even so, the ruling spirit of our naval board of inspection in 1903 pooh-poohed this provision, declaring that a mother ship would always be necessary and that the men would live aboard the larger craft. How far that mistaken authority erred can be gathered from the performance of a sister boat."

"After that little vessel became part of the czar's fleet she made a run from Kronstadt to Libau in October of 1905. The official report of the commander of the vessel best tells the story: 'This trip confirms once more the good seagoing qualities of boats of this particular type, as several times we were out in cold weather and exposed to high winds and heavy seas, yet, notwithstanding these conditions, the submersible stood the weather every time quite easily. At one time, for 24 hours, by reason of the violence of the wind and the nature of the sea, it was not possible to pass food from the conveying vessel. During that period the deck was swept by heavy seas and the crew were able to take the air only on top of the conning tower; but notwithstanding this when I proposed to them the next day that they might go over to the convoy if they liked they again asked permission to remain on the submersible.'

"Yes, the underwater craft are coming into their own."



SUBMARINE WAITING TO ATTACK



SUBMARINE ENTIRELY SUBMERGED

submarines of 2,500 tons, with the speed of a battleship, and it may be possible to build them of a speed equal to that of the fast cruisers, but the handicap in properly engineering them has caused us to hesitate in putting propositions forward for their construction. The moment a reliable engine is provided that will furnish a speed equal to that of the surface vessel, of whatever type such surface vessel may be, that moment surface vessels of that order will become obsolete for purposes of war; their only use will be to train seamen and to carry the flag in times of peace."

"How did I begin my work in submarine navigation? Well, the story is not a long one. Of course, you will expect me to tell you that Jules Verne's 'Twenty Thousand Leagues Under the Sea' was my inspiration, and you shan't be disappointed. From my boyhood days that scientific romance gripped me irresistibly, and I was not more than nineteen when I began experimenting in a crude way."

"It was then 1885, and I was living at Tom's River, N. J. My preliminary investigation was in an overturned rowboat, under which I crawled to see how long I could survive in the air confined close up to the inner bottom of that craft. I stayed there so long that a passing fisherman thought me drowned and righted the boat, expecting to tow it ashore and to report my loss."

"In 1893, as you possibly recall, the navy department asked for bids for a submarine boat. I submitted the design of one intended to travel on the surface, in between the bottom and the surface or on the waterbed—a sort of underwater automobile, so to speak. I had no financial backer, and the government exacted that the successful bidder should put up a bond as a guarantee of contract fulfillment. Needless to remark, I did not get any recognition of a substantial sort, but I did obtain favorable comment from some of the official critics. That, at least, gave me encouragement."

"Shortly afterward I moved to Atlantic Highlands, and there, thanks to the financial assistance of an aunt, I built the submarine which I jokingly named Argonaut, Jr. That was in 1894. The Argonaut, Jr., was a coffinlike box built of yellow pine timber in two layers, coated with coal tar and lined with felt to make it water tight. It was 14 feet long, 4½ feet wide and had a depth of 5 feet. It was mounted upon wooden wheels."

"The vessel was intended to navigate only on the bottom and was driven by hand power; a crank shaft, ending outside with sprocket wheels, was geared by a chain belt to the two rear drivers. Inside, the bow part of the boat was partitioned off by an air-tight bulkhead which made the foremost compartment a veritable diving bell, with a water-tight door in the floor that could be opened. For air storage the boat carried a soda water tank, and a plumber's hand pump did duty as an air compressor. When the confined air reached a suitable pressure the bottom door could be dropped without fear of the water coming in when the Argonaut, Jr., was submerged."

"The craft was finished on Christmas day of

## NOTES FROM MEADOWBROOK FARM



William Pitt

Cultivate the late cabbage.

Chickens like alfalfa pasture.

Clean the poultry house every day.

Feed all fowls confined in the yard green food.

It is a mistake to regard sheep simply as scavengers.

Overpruning induces the growth of suckers or watersprouts.

There is no better property on a farm than good brood mares.

Calves may be fed silage as soon as they are old enough to eat it.

Do not throw away old broken plaster and mortar. Put it in the poultry yard.

A dairy thermometer can be had for a few cents. It beats guessing all hollow.

Keep the ewes in a barn on dry feed for a few days after being separated from the lambs.

It is always the case that sweet cream poured into that which is sour does not all churn.

Alfalfa cured too long in the sun sheds its leaves and with them a good share of its food value.

The high-producing milk cow must have a liberal allowance of grain in order to do her best work.

The keeping of individual cow records is becoming more and more an absolute necessity each year.

Variety in food is something the hens need. A fowl grows tired of one kind of food in a short time.

An acre of grain can be placed in the silo at a cost not exceeding that of shucking, husking, grinding and shredding.

If the farmer today would house his poultry with as much care as he does his cattle greater dividends would ensue.

Spray your trees whether they have a crop or not. Spraying in off years is just as important as in years of heavy crops.

More than \$500,000 is annually being spent in the New England states alone in the endeavor to control the brown fall moth.

Capons are superior in every respect to all other fowls. The public demands them and the poultry raiser must produce them.

The "gentleman of the herd" will make a gentleman of you if he is a good one, and help you to make your dairy the best possible.

The labor of thinning fruit trees can be considerably lessened if the trees are pruned with the idea of removing a portion of the fruit buds.

Crops can be put in the silo during weather that cannot be used in making hay or curing fodder, which is an important consideration in some localities.

Wood ash is a good fertilizer for the trees, and in the garden, but do not put it in the poultry houses, as it has a tendency to injure the legs of your fowls.

Not only do turkeys—about 100 to each quarter section of land—gobble up the grasshoppers effectively, but they do little if any damage to the alfalfa fields.

Before buying a bull study closely the production records of his female ancestry, particularly his dam. Great producing cows are very likely to reproduce their abilities in their sons.

Preservation of the poultry buildings means the same as cash in the bank. Keep them well painted outside and whitewashed inside. It also adds to their attractiveness and sanitation.

Although a flock of well-feathered ducks or ducklings, geese or goslings will not suffer from staying out in the rain, they will immediately show the bad effects of housing in damp quarters and their buildings must be thoroughly dry.

The remedy for sour land is lime and proper drainage. First drain off all moisture and allow the soil to become dry. Then spread ground limestone rock and as this works down into the soil you will find all traces of sourness disappear.

Be regular in milking.

Be gentle with the heifers.

Look out for lice on chickens.

Every farm should have some clover.

Cabbage thrives best in a cool, moist climate.

Alfalfa should not be cut too late in the season.

Summer pruning decreases the vigor of the plant.

Fashions change, but a good cow is always in the fashion.

Proper cultivation is an important factor in crop production.

Pure air and plenty of it is an absolute necessity for turkeys.

When cows are in the pasture do not send a vicious dog to drive them in.

Growing lambs for mutton is a paying business independent of the wool crop.

Prune weak growing varieties heavily in winter; strong growing sorts, lightly.

The quarters of lousy hogs must also be treated if vermin is to be destroyed.

Any future increase in the production of sheep must come mainly from the farms.

Do not set apple trees too close—twenty to twenty-five feet is about the right distance.

Nest boxes should be built low and the entrance somewhat shaded, as the hens seek privacy.

Where the number of chickens is great, it is a good plan to plant clover just for their use.

Never permit a hog to become lousy, using crude carbolic acid and coal tar as a preventive.

Fresh, clean, cool water for hens and chicks and other kinds of poultry is very essential in hot weather.

Always water the horse after he has eaten his hay at night. Do not go to bed leaving him thirsty all night.

Planting cucumbers in continuous rows insures fruit from one to two weeks earlier than the hill method.

If the strawberries have been picked two seasons, spade up the beds and sow the land for some late planted crop.

The woodpeckers do a wonderful amount of good by digging out and devouring young worms and insects on trees.

More cleanliness about our hog pens, coupled with proper care about introducing infection, will keep cholera out of the herd.

Give the chickens all the lawn clippings and waste leaves and vegetables. Give plenty of green food to the laying hens.

The hog depends to a certain extent on grain during the growing period and must be fattened almost entirely on concentrated feeds.

Remember never to strike a cow. If she is mean, that is no reason why you should be. Turn her off and put a good cow in her place.

It is stated that one-half the apple crop in Iowa, representing a value of \$2,000,000, is lost annually because of damage by the codling moth.

Keep the chicks out of damp places and watch for roup. Dampness affects the feet and legs of the chick. The higher the breed, the greater the care must be.

There are still some pretty poor bulls in this country. Wherever you find one of those animals, you will find a man with whom dairying is a dismal failure.

Fruit trees in the orchard must be fed like so many pigs in a pen if the trees are to produce well. Unfertilized fruiting plants will not yield enough to pay for their care.

"Soil" is a mixture of earth, water and air. Too much of either is bad; too little means partial or entire crop failure. Cultivation, early and often, gets conditions right.

The world never yet saw the best cow. Don't be afraid you will be lonesome in your hunt for her. There are a lot of men looking, and you may as well be at the head of the heap as not.

Barnyard manure, available on every farm, makes one of the best organic fertilizers to use, and every farmer ought to consider ways and means of preserving it. When left in the open in piles for even a short time the loss is very large.

Fertility may be restored to worn-out land by saving all animal manures and putting them on to the land; by making use of all crop residues—that is, putting back into the soil every thing not used for feed; by turning under green manuring and catch crops,