

SUBMARINE FISHING BOAT TO KEEP UP SEA FOOD SUPPLY

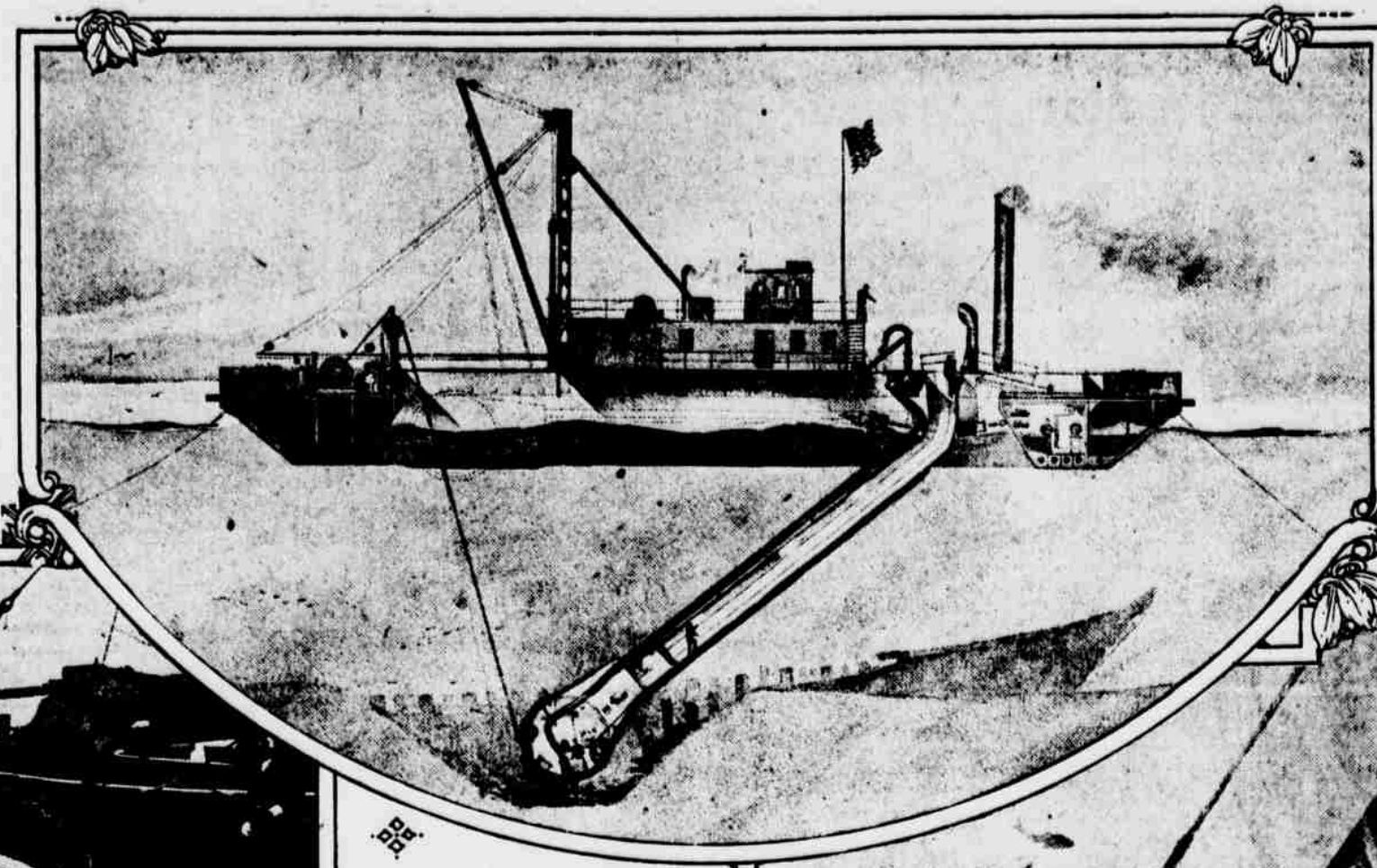
Simon Lake's Latest Device Can Tap Unlimited Beds of Oysters and Clams and Salvage Wrecks

EAT more fish," is the latest advice of the United States Food Administration; let the rivers, lakes and oceans supply any deficit in the way of meat or farm products.

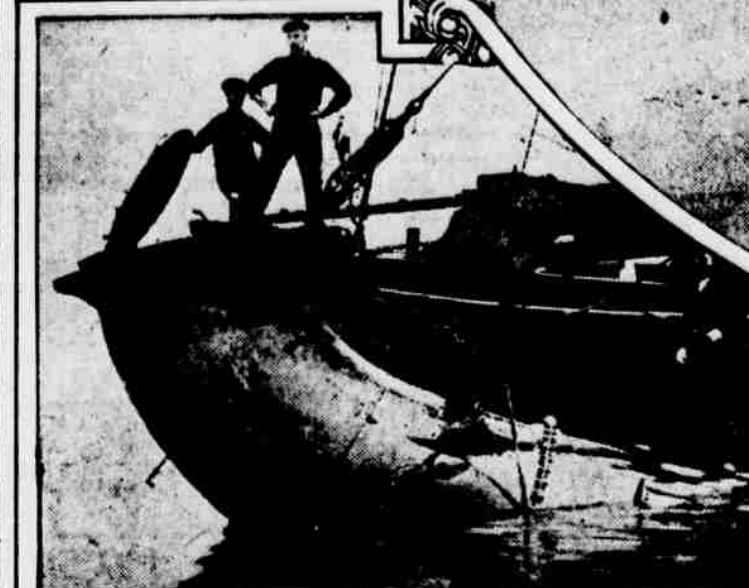
"All very well, but how is it to be done? Is it possible to get more food from the sea than heretofore? Simon Lake, inventor and consulting engineer, answers that it is possible, and he has set about proving his contention in a practical way. As he puts it:

"The sea can be made to yield us millions of tons of nourishing food which we now neglect. Our coastal waters can do a tremendous service for us in keeping down the cost of living. Fish, bivalves, mollusks, etc., are there to be had in abundance if we will go about harvesting them in an efficient and up-to-date fashion. But to achieve these ends we must employ novel apparatus."

When in Europe in 1905 and 1906 building submarines for the Russian Government, Mr. Lake became interested in submarine salvage and planned to recover the gold and silver bullion supposed to be still buried in the wreck of the British frigate La Lutina at the entrance to the Zuydcoote Zee. He set about designing a special vessel with a salvage tube which would make it possible to engage in subaqueous recovery work even though the sea was rough and the water too shallow for the safety of the types of surface craft ordinarily employed in kindred undertakings. It



A LARGE LAKE SUBMARINE SALVAGE OUTFIT PUMPING UP COAL FROM A SUNKEN COLLIER. DIVERS ARE NOT NEEDED FOR THIS SUBAQUEOUS WORK.



THE UPPER END OF A LAKE SUBMARINE SALVAGE TUBE, ALONGSIDE AN ATTENDANT SURFACE CRAFT.

was then that he evolved the idea of a submarine diving chamber attached to a tubular passageway held at its upper end to a surface vessel by means of a flexible mooring.

By way of preparation for the recovery of La Lutina's treasure Mr. Lake built in 1907-08 at Brightonsea, England, a salvage tube having the desired features and fitted with powerful electrically operated pumps for the purpose of dredging away the sand that covered the old wreck. The tube was tested in English waters by means of a small steam trawler and the demonstrations confirmed the general correctness of the invention.

Since then the commanders of submarines have learned that there is a deal of difference between the theoretical and the actual underwater effort of ocean waves. While the billows may not have a height of more than 15 or 20 feet at the most their subaqueous reflexes reach down nearly 100 feet, particularly when the coast is near. This action induces an up and down motion of a submerged submarine that is technically termed pumping; and for that reason U-boat commanders and the skippers of British underwater craft have found it distressing to be driven to the sea bed to rest in relatively shallow waters while a storm is raging above.

A little more than a week ago Mr. Lake launched at Bridgeport, Conn., a couple of unusual vessels designed to work cooperatively. One of the boats he named the Argosy and the other he dubbed Argonaut III.

The Argosy is outwardly much like a large houseboat, having a length of 100 feet, a beam of 20 feet and drawing something less in draft than a water. The Argonaut III, on the other hand, suggests a fitly submarine because of its modest size, and is an underwater boat that will be linked with the Argosy by means of a steel tube about 150 feet long.

The tube is of sufficient diameter to provide a passageway for workers going down from the surface vessel or mounting on the submerged submarine to the Argosy. In other words, the Argosy will play the part of a seagoing navigable base for the Argonaut III, when the latter is trailing along upon the surface or when it is crawling upon the waterbed for purposes of exploration, for salvage, for fishing or for dredging. The whole equipment is the outcome of Mr. Lake's subaqueous experience, starting with his submarine, the Argonaut, built in Baltimore in 1897.

A Boat on Wheels.—The original Argonaut differed radically from other types of submarines inasmuch as it was not designed to travel submerged between the surface and the bottom, but was intended to navigate either upon the waves or on the waterbed by means of Jarco wheels. It was only thirty-six feet long and its greatest circular cross section had a diameter of nine feet. The boat was driven at the surface and submerged by a modest 30 horsepower gasoline engine, and air for the motor and the crew when under water was obtained through a pipe reaching to the surface.

Small as the craft was it was able to accommodate a crew of five men; and in 1898 the boat cruised over 2,000 miles in Chesapeake Bay and on the Atlantic coast, traveling both on the surface and under water.

The diving compartment was virtually a diving bell built into the submarine and equipped with a hatch or door in its floor which could be opened when the boat was under water and permit a diver to pass down and out upon the seabed. The air in the chamber was maintained at a pressure suitable to balance that of the outlying water at the working depth and thus to hold the air tight. So much for the original inspiration of the fun-

deramental feature of his present apparatus. When in Europe in 1905 and 1906 building submarines for the Russian Government, Mr. Lake became interested in submarine salvage and planned to recover the gold and silver bullion supposed to be still buried in the wreck of the British frigate La Lutina at the entrance to the Zuydcoote Zee. He set about designing a special vessel with a salvage tube which would make it possible to engage in subaqueous recovery work even though the sea was rough and the water too shallow for the safety of the types of surface craft ordinarily employed in kindred undertakings. It

was then that he evolved the idea of a submarine diving chamber attached to a tubular passageway held at its upper end to a surface vessel by means of a flexible mooring. The experiments made with the Brightonsea tube furnished Mr. Lake valuable data, and his present equipment has been improved in certain important particulars. The tube constructed in England was not provided with self-propelling features. This arrangement developed difficulties and it was found impossible to obtain that nicety of directional control which was to be desired.

Buffers Against Waves.—The Argonaut III is fitted with bottom wheels hung on hinges or arms, and these in their turn are functioned by pistons which play the part of springs or buffers in cushioning the blows of obstacles encountered by the wheels in traveling upon the ocean floor or in absorbing the shock of any vertical movement of the sea which might tend to lift and then throw the submarine violently back upon the sea bed.

Fourteen years ago a naval expert laughed at Mr. Lake when he said that the ground swell set up by a storm induced a disturbance at a depth of forty feet or more. He referred Mr. Lake to a classical work on the theory of waves and declared that it was mathematically impossible for the agitation to reach deeper than the wave was high from crest to hollow. He intimated that Mr. Lake's claims must have been faulty and left it to be inferred that when one of the original Argonaut's wheels was damaged under water it was because the boat was at a shallow depth and therefore pounded by the waves directly.

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The modified Argonaut was provided with a wrecking pump, and by a submersible freight boat, like a strong steel cylinder. This craft was equipped with a watertight hatch and valve connections by which water and air could be forced into the freighter at will either to make it sink to the seabed or to rise to the surface after being loaded submerged through its open hatch.



SIMON LAKE'S SUBMARINE WORKING CHAMBER. THE OPERATOR, IN HIP BOOTS AND SURFACE DRESS, GUIDING A SUCTION TUBE IN RECOVERING GOLD FROM THE BOTTOM OF A DEEP RIVER.

it is advisable to hark back to 1900, after the original Argonaut was cut in two, lengthened and somewhat modified, at a dry dock in Brooklyn, so as to increase the boat's surface going seaworthiness and habitability. Just about that time Mr. Lake decided to use his submarine for under water salvage operations, such as the recovery of sunken cargo and the reclaiming of coal from foundered barges in Long Island Sound.

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A coal barge was known to have gone to the bottom in the neighborhood of the Bridgeport Lighthouse, and the Argonaut took up the search under water and in something like two hours was able to locate the wreck to a certainty. What followed has been thus described by Mr. Lake:

"She then towed the submersible freight boat out, sank it alongside the wreck, and in seven minutes after removing the hatch cover and getting the suction and discharge pipes of her pumping apparatus arranged transferred from the wreck to the submersible freight boat more than eight tons of coal. The hatch was then closed and the water forced out by the admission of compressed air, and in five minutes thereafter the freight boat came to the surface with its load."

So much for the past performance which have served as stepping stones to the present evolution of Mr. Lake's subaqueous salvage and fishing plant.

Abalone Available Also.—There is another possible commercial application along similar lines to the harvesting of scallops and other shellfish. Mr. Lake has recently been successful in recovering from a sunken collier a cover of about one hundred tons of abalone, and it is estimated that this source of food is used extensively in the manufacture of buttons, ornaments, etc.

According to Mr. Lake it is possible by means of an outfit like that of the Argosy and Argonaut III to cover immense quantities of sea floor that are not within the reach of surface fishermen or even the men now engaged in the work on the shores of California.

While the Argosy does not represent a big plant, still it promises the recovery of much commercial value. For instance, the Argosy, if submerged, will have a suction pump which is capable of dealing with subaqueous work down to the submarine depth of the sea bed.

The underwater workers on the Argonaut III, as a base of operations, may wear a self-contained diving suit or have recourse to nothing more complex than a simple headgear of the "diving hood" type. It will be possible to make short descents on operations of this nature, and to accomplish results with a minimum of risk and in close cooperation with the men in the diving chamber of the submarine. While the Argonaut III is busy harvesting at one point, the Argonaut can be looking about for the next place to operate.

Fishing With a Searchlight.—There is no doubt that an outfit such as Mr. Lake has just built would make it possible to make short descents the way of catching fish. Some years ago in one of his earlier submarines the crew, by way of amusement, opened the bottom door of the diving compartment one night when the boat was lying at the surface. The diving lights within the chamber cast the beams down into the water, and through the open hatch, and in a few minutes scurrying schools of fish crowded into the illuminated pool at some of them barely missed the clear of the water and on to the top of the diving compartment. This was a striking example of the force of the impulse of fish to light.

Mr. Lake purposes employing the drawing power of submersible boats to attract fish to his submarine. Then when they are swimming about the boat he will bring into operation the searchlight and direct the fish through the pipes into holds arranged in the surface craft. This makes it practicable to harvest big drags of tons of fish in a short time, and to transport them alive to ports for distribution.

EVILS OF ROYAL DIPLOMACY IN MANY COURTS CAUSED GREAT WAR

Dynastic Alliances Designed to Offset Finesse of Statecraft Reacted Against Makers and Brought Nation After Nation Into Great World War—The Striking Examples Pointed Out

By F. CUNLIFFE-OWEN.

MANY years ago, in the early days of the alliance between Russia and France, Czar Alexander III, remarked one day to the French General De Boisdeffre, then visiting Petrograd at the head of a military mission: "Call me an autocrat as much as you like. But I hold that alliances of blood, in fact dynastic alliances, have a far higher value than all the finesse and cunning of diplomatists. It is a pity that France by doing away with monarchy has renounced the political advantage of possessing princesses whom it could offer in marriage as a guarantee of peace."

At that time there seemed a wealth of philosophy in this utterance of the late Emperor of all the Russias. For "the crimson streak of kinship" entered into political calculations to an almost incredible extent and domestic ties of royalty were regarded as an all important factor in the maintenance of harmony between the Powers of the Old World. This is no longer the case. We seem to have reverted to those medieval eras when dynastic causes were the origin of almost every great war.

When the history of the titanic conflict now in progress, and into which well nigh every Power of the Old and the New World has been drawn, comes to be written it will be found that the existence of these bonds of relationship between the sovereign houses of Europe, far from constituting a safeguard of peace have been on the contrary very largely responsible for the last three terrible years of international woe and strife, have served to impart to the struggle a venom, a bitterness, and in some cases, a tragedy, which would otherwise have been absent, and, worse than all, have stultified and defeated all the efforts of the statesmen of the belligerent and of the neutral Powers in behalf of peace.

Reform Certain After War.—When the latter in the fulness of time is restored and the nations have at length the leisure to review calmly the immediate past and to take to heart the lessons taught by the war it may safely be assumed that they will take steps first of all to restrict their ruler and the members of his house in the line of succession to the throne to matrimonial alliances with their own countrywomen so as to avoid all foreign entanglements, and in the second place to deprive their monarchs of

every remaining vestige of right of interference in the conduct of the foreign policies of their Government. The experiments made with the Brightonsea tube furnished Mr. Lake valuable data, and his present equipment has been improved in certain important particulars. The tube constructed in England was not provided with self-propelling features. This arrangement developed difficulties and it was found impossible to obtain that nicety of directional control which was to be desired.

The inventor realized that he could not achieve his ends unless the submerged end of the tube could be guided to a nicety by the men in the submersible chamber. Therefore he has elected to substitute a small submarine for his earlier working chamber rigidly attached to the Brightonsea tube. The Argonaut III, is joined to the connecting tubular passageway in a manner that permits of considerable flexibility of movement on the part of the under water boat and of the tube itself, as well as in the case of the surface power plant, the houseboat Argosy.

The Argonaut III is fitted with bottom wheels hung on hinges or arms, and these in their turn are functioned by pistons which play the part of springs or buffers in cushioning the blows of obstacles encountered by the wheels in traveling upon the ocean floor or in absorbing the shock of any vertical movement of the sea which might tend to lift and then throw the submarine violently back upon the sea bed.

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