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Undersea Fighting of the Future

I.—Mobilizing Submarines on Rails

By Simon Lake

Under the general title "Undersea Fighting of the Future," we publish two articles, by two distinguished engineers, in which the possibilities of the submarine are set forth in a way which shows that we have only begun to learn the use of the most powerful naval weapon thus far developed. Mr. Lake's article deals with the mobilization of submarines for defense; Mr. Chandler's with a highly ingenious method of engaging and destroying submarines under water.

Simon Lake came prominently before the public notice about fifteen years ago as the inventor of a submarine on wheels—a craft which could not only navigate under water but which could also travel on the bottom of a waterway. He acted as advisor on submarines to the German and Russian governments.—EDITOR.

I FIRMLY believe the destiny of the submarine is to stop all future maritime wars between countries. A tremendous power for destruction, the submarine is in itself useless for purposes of invasion. The moment the submarine becomes visible it becomes vulnerable. Its function, therefore, is to lie in wait and attack unawares. All students of warfare must now admit that it is manifestly impossible to send an army across the sea with big guns and troops and to land them, if submarines are on watch. I believe all engineering experts must also admit that when the proper motive power for submarines is evolved, a motive power which will give the submarine the speed of a surface ship, then merchantmen cannot carry on commerce on the high seas except by mutual agreement equitable to all nations. And I believe this will hasten the day when each country will consent to agreements to "do unto others as they would be done by."

Simon Lake, the author of the article on this page, is the inventor of the "even-keel submergence type" of under-water craft which has in recent years been introduced by most of the navies of the world

If, in time of national differences, it were possible for each country to encircle itself with a zone ten miles in width, to pass which would be sure death, it would not be long before quarreling countries would make up their differences. If our country had sufficient submarines to protect its coast line and to establish such a similar zone, an offensive war would be rendered unnecessary.

Last year Congress made an appropriation calling for 25-knot submarines, to cost not more than $1,500,000 each. I saw this reported in the newspapers and I immediately wired the Department that it was impossible to secure 25-knot boats for less than about two-and-a-quarter million dollars each, and I later advised that it would then probably take several years to develop a suitable engine. The largest submarine engine of which I know is one of 1300 horsepower, completed in Italy for one of the large German boats just at the beginning of the war.

As it would probably require about 10,000 horsepower to attain twenty-five knots, Congress hardly realized how stupendous was the problem of producing at a single step a boat capable of traveling nearly twice as fast as the best underwater vessel of the day. No wonder there were no bidders for a 25-knot-boat.

While it was impossible, even with unlimited money, in the present condition of internal combustion engineering, to develop a 25-knot submarine boat quickly, it is possible to get quickly a large number of 50-knot submarine boats of small size, which for the same expenditure would prove many times more effective in warding off an attack than the larger boats. I refer to what I call "amphibious submarines;" that is, submarines of about two hundred tons displacement, which could be hauled on special railway trucks from one point of the country to another at a speed of fifty knots per hour, with crews, stores, equipment, all on board. The railway tracks would be continued down under the water as a submarine railway at such points as the Government might desire. It would be necessary only to back the truck and submarine down into the water until the submarine floated. Her commander would only need to give the bell and she would be off. Such boats could probably be built for three hundred thousand dollars each to make ten knots on the surface and about eight submerged. It would be possible to get six or eight such boats for the cost of one twenty-five-knot boat and cover six to eight times as much territory. A torpedo fired from a small, inexpensive boat is just as effective as one fired from a large, expensive boat. The small boats could make the trip from New York to San Francisco in four days, New York to Boston in five hours, New York to New Orleans in thirty-six hours, in perfect safety, while a modern large submarine, under war conditions, could probably not make the trip at all, except as a slow-going surface boat, liable to capture or destruction. One hundred of these amphibious submarines could be quickly turned out by the various shipyards throughout the country, and it would also be possible to get engines quickly for them; the power required permits of using sizes of engines that have already been developed by several concerns. Such a system of coast protection would enable the quick mobilization of a large number of submarines at any threatened locality, for harbor or coast defense purposes. Of course it would be advisable to have a large number of submarines for off-shore work or to patrol the coast where distances between ports or harbors would be too great for the smaller craft.

Many disadvantages accompany the use of the storage battery. It is very heavy for the horsepower energy it carries. It is also bulky, so that only sufficient energy may be carried to propel modern submarines at about eleven knots per hour for one hour, about eight knots per hour for three hours, or at about five knots per hour for twenty hours. This means that when the energy is exhausted the submarine must ascend to the surface or secure surface connection in order to obtain air to enable her engine to be run to recharge her batteries. This is likely to prove her undoing, as the noise of her internal cumbustion engines in charging, can, with a proper receiver, be heard many miles, and would direct an enemy surface boat or submarine to her. Therefore, before the submarine can become invulnerable, she must become capable of operating without sound. If it were possible to produce some sort of primary battery whereby energy-producing material could be put into the battery like coal into a furnace, it would be ideal for submarine torpedo-boat use, and the submarine would then become invincible.