

Fantastic

ADVENTURES

TRADE MARK REGISTERED

Contents for August, 1942

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A JULES VERNE FANTASY

by JACK WEST

Jules Verne invented the modern submarine in his imagination. It is the classic "fantasy come true"

SOME seventy years ago, when Jules Verne first thought of the submarine in his book *Twenty Thousand Leagues Under the Sea*, little did the people of that day dream that huge sea monsters would someday roam the depths like so many wolves. Least of all, Jules Verne never intended that the submarine become a tool of war. He had always thought of it as an efficient means of ocean transportation, more efficient than traveling on the surface. Yet, since its inception, the submarine has scarcely been used for anything but warfare.

Among the first records of a submarine being used in warfare is that of the Confederate submarine "David," so named after her inventor. In 1863 the Confederates in Charleston sent their submarine after a Federal squadron only to have their craft sink from under them, dragging their crews to death. On the fourth try, however, the much salvaged "David" managed to blow up the *Housatonic*, but was not able to get away. This time the "David" and her crew were blown into limbo.

In 1885 America began seriously to consider the question of submarines for her navy. She invited a Swede named Nordenfelt and an American named J. P. Holland to submit designs. Nor-

denfelt designed several boats that were driven by steam. Upon diving, the funnel had to be taken down, the fires put out, and the reserve steam used to drive the boat while submerged. Actually submerging was accomplished by drawing water into ballast-tanks and operating a series of horizontal propellers, one on each side of the boat. By this process the boat was literally pushed into the water in a manner similar to an elevator descending from the heights of a skyscraper, straight down and straight up. Nordenfelt was convinced that no submarine could descend or ascend at an angle.

Nordenfelt's boat was a failure mainly because of her lack of stability. Any slight swaying made the water in her boilers and ballast-tanks surge violently to and fro, and this immediately started the ship off on a kind of drunken spree that more than once endangered the crew. So precarious was Nordenfelt's submarine that when she fired her first torpedo she nearly stood vertically on her tail; while the unexpected wash from a nearby boat, as she was about to descend, filled her open conning-tower with water, causing her to sink like a stone. Only the quick action of the crew in blowing out her ballast-water restored her buoyancy and enabled her

to rise to the surface.

IN violent disagreement with Nordenfelt's ideas was the American inventor, J. P. Holland. His ship was designed to descend and ascend at an angle as an airplane does. Ballast tanks are used, but once the submarine weighs as much as the water around it, it can dive and come to the surface by using only its elevators. At this point the English government, recognizing the value of Holland's invention, asked him to come to Britain and design a British submarine fleet.

The first submarines Holland designed for the British were powered with gasoline motors, but this practice was soon discontinued because gasoline gives off deadly fumes in a closed chamber, and causes explosions. The diesel engine was the answer to Holland's problem. Its heavy crude oil would not burn or explode, was excellent ballast, and easy to handle.

Almost every year since those early submarine days at the turn of the century has brought improvements in submarine design. Along with advances in the design of diesel motors came better storage batteries. The diesel engine propels the boat while on the surface and also drives the dynamo which generates electricity which is stored for use when submerged. Most submarine experts are convinced that the storage battery and the diesel engine are the two inventions that have made the modern submarine possible. Compressed air proved inadequate for the speed required of a submarine. Steam required a large cargo of coal that upon use affected the boat's equilibrium. No matter how careful the calculations as to ballast water to compensate for coal burned, no one knew exactly when the coal was burned completely. Oil is burned instantly and easily compen-

sated for.

The first submarines were as blind as a bat while running submerged. Furthermore, electric currents in and about the steel hull made navigation by compass next to impossible. The periscope has given the submarine eyes, and the gyroscope compass keeps it on her course. (Some fifty years ago Lewis Nixon, head of a submarine company, applied for a patent on a rotating telescope which would enable submarines to see above the surface of the water while running submerged. His patent was blocked because a description of such a device is in Jules Verne's *Twenty Thousand Leagues Under the Sea*, published twenty years earlier.)

In construction the modern submarine looks like a huge metal fish. In its center is a sort of bridge known as the conning tower. This conning tower is protected with armored steel and lighted by windows through which the navigating officer can see his course while running half submerged. On early submarines the conning tower hatch led directly into the bowels of the submarine. However, several horrible accidents caused by open conning tower hatches led to the double hatch system now used. Should the sea break over the first hatch, it still would fail to penetrate the second hatch and get into the vulnerable interior of the ship. But in the case of an accident, the sailor on lookout is caught between the two hatches; yet, strangely enough, the lookout usually escapes alive while his companions often drown.

ONE of the most unusual of all submarine feats was that of the *Deutschland*, a German cargo-carrying sub that operated between this country and Germany during World War I. This sub was built for the sole purpose of transporting valuable supplies from this

country to Germany in spite of the British blockade.

The *Deutschland* was able to sneak by a literal maze of British patrol boats, mines, nets, etc., in the North Sea and English Channel, and make two successful voyages to this country and return. Even the toughest of English sea dogs admired the guts of the *Deutschland's* crew, because they knew the English Channel was a groping mass of steel submarine nets. Once a sub fouls her rudders or propeller in a net, she must either come to the surface to be captured, or else if she cannot rise, the crew faces certain death by drowning or suffocation.

The *Deutschland* carried no guns or torpedo-tubes. Her length was about 300 feet, breadth 30 feet, and depth of hull, 17 feet. In order to completely submerge she required water over 30 feet deep. In general overall appearance she looked a good deal like the whaleback steamers you see on the Great Lakes. A narrow deck about six feet wide, tapering at the ends, extended from bow to stern at a height of about two feet above the curved hull. The navigating bridge, located near the center of the boat, was about 25 feet above the water when the vessel was running on the surface. The *Deutschland's* hull consisted of two shells, an outer and an inner. The outer hull was an oval in cross-section, and gave the boat its ship-shaped form, providing better streamlining. The inner hull was circular and was so designed to withstand high water pressures when the boat was running submerged.

Unique too was the interior arrangement of the *Deutschland*. Since absolutely no armament was carried, virtually all of the interior space used for these devices was used for cargo. The total cargo capacity was 600 tons. When on the surface the *Deutschland* was

driven by two, 600 h.p. diesel engines that pushed the ship along at a top speed of 18 knots. When submerged the huge ship was driven by electric motors, drawing their power from several hundred storage batteries. Her maximum underwater speed was 12 knots. In her first trip from Bremen to Baltimore, she took only sixteen days, slightly less than the twenty days required by an average freighter. The *Deutschland's* crew consisted of three officers and twenty-three men.

GRAY-HAIRED, 75-year-old, Simon Lake, designer of the first submarine to operate successfully on the open sea, about a year ago suggested that this country build a fleet of 100 cargo carrying subs. Built at a cost of only 200 million dollars, these subs, according to Lake, could run any blockade with almost complete security. "Each of the submarines would carry cargoes of 7,500 tons," Lake explained. "They would cost only slightly more than surface vessels of equal capacity."

Lake explains that today's submarines can be provisioned by undersea supply vessels. That is, it is possible for other submarines to transfer oil and ammunition while still under the surface! In other words, the modern sub doesn't have to return to its base for the entire duration of the war, merely coming to the surface at night to replenish its supply of air. Of course, such a situation is not likely, but it is most certainly possible.

A few other startling facts: World War I subs fired torpedoes carrying only 500 lbs. of TNT. Today torpedoes can be built to carry 10,000 lbs. of TNT. The modern sub can locate its prey by means of high frequency beams which permit it to fire a torpedo without coming to the surface. Super sensitive radio hearing devices enable it to

hear the approach of any surface vessel within the astonishing area of 100 square miles, or within a radius of five miles. In short, says Lake, today's sub can remain absolutely silent, motionless, invisible, lurking in the bottom of the sea, capable of seeing, hearing, locating, any vessel above it.

According to the last available report, the largest sub ever built is the British X-1. This enormous ship is designed to accompany the battle fleet in the character of a submarine destroyer, ready at an instant's notice to dive and attack the enemy's line with torpedoes; and for secondary use in long range reconnaissance and patrol.

Driven by two diesels at a surface speed of 22 knots (about 24 m.p.h.), the X-1 has enough speed to accompany a battle fleet into action. Her underwater speed is estimated at 10 knots. She has a displacement of 3,600 tons, four 12-inch guns, and carries a crew of 120 men.

Reports seeping out of Germany just before the war reveal that Professor Oswald Flamm, one of the ablest of German naval architects, who took a prominent part in the construction of the World War I U-boat flotilla, had completed designs for a submarine cruiser of 7,067 tons surface displacement, a length of 403 feet, and a 49-foot beam. The conning tower and all those parts of the ship exposed while running on the surface are plated with 5-inch armor, amounting to a total weight of 614 tons. The German sub can store enough fuel oil for a voyage of 22,000 sea miles, or almost around the world. Flamm's giant sub can cruise at 12 knots and requires a crew of a hundred men who can submerge the vessel in one minute.

AN American sub of the Barracuda class displaces 2,500 tons, carries

a crew of 75 at 19 knots on the surface and 8 knots submerged. These subs are 326 feet long, carry one 3-inch anti-aircraft gun, six 21-inch torpedo tubes, and 16 torpedoes. They are driven by electric motors from power supplied by two diesels of 6,700 h.p. while cruising on the surface, and by storage batteries when submerged. Barracuda class subs can cruise more than 12,000 miles without a stop and cost close to eight million dollars.

The smallest subs in use are those of the Japs. One of these recently captured off the island of Oahu during the memorable raids on Pearl Harbor revealed a midget craft of 41-foot length with provisions for a crew of only two. The Jap sea termites have a cruising radius of about 200 miles at low speed, have only electric motors, and carry two 18-inch torpedoes. The Jap sea midgets carry 300 lbs. of explosive wired to a battery. In this manner the suicide Jap crew are supposed to sneak their sub under an unwary vessel and blast both themselves and their enemy vessel into kingdom come. These underwater mites have yet to prove their worth.

Nonetheless, these sea midgets carry a complete complement of equipment. Such equipment includes: gyro-compass, magnetic compass, radio equipment, underwater sound and listening devices, and enough electrical power from batteries to make 24 knots. The periscope projects five feet above the top of the conning tower. The hull is constructed of one-quarter inch plate, divided into five compartments, two of which are occupied by electric batteries.

The two worst enemies of the submarine are the depth charge and electrical listening devices. A depth charge, released by a destroyer or airplane, exploding within a hundred feet of a sub, will crush its sides. Electrical listening

devices used on subchasers are similar to electrical altimeters used on aircraft *in their operation*. They send out a constant beam that is instantly reflected back when it strikes a metal object. Two such beams emanating from the bow and stern of a single destroyer give the exact location of any sub within a radius of ten miles. Once the sub is located the area is completely blasted with depth charges until an oil slick or bits of debris give evidence of a sunk sub. An old trick of sub commanders is the release of oil and debris in an effort to make the enemy think they have been mortally damaged. Now, U. S. sailors only fall for an oil slick when it is big enough to cover a city block.

Sub commanders as a group dislike glassy-calm weather, because it shows up periscopes with a white plume when running submerged. Ideal sub weather calls for a slight chop with waves about three feet high. Very rough weather can be avoided by subs by running submerged, but firing torpedoes in this weather is far from accurate. To use its periscope the average sub must rise to within 20 to 30 feet of the surface. In this position the sub is in great danger of being rammed, sunk by depth charges, or spotted by aircraft and sunk by bombs. Once hit a sub sinks rapidly because it has very little reserve buoyancy. Hatchways to the deck are few and far between and they are rarely opened. Even the stoutest of seaman admit that sub crews are made of the toughest stuff.

In this country as in Britain, service on submarines is on a voluntary basis, yet there always has been a waiting list. Navy men, serving on sub duty, get from five to thirty dollars additional each month, depending on their qualifications and duties. In Germany sub duty at the closing of World War I was compulsory. The Allies took advantage of this fact by refusing to publish any information concerning the sinkings of subs. From the German point of view the subs just went to sea and disappeared never to be heard of again. This so demoralized the crews at the end of three years that many of them were shot for desertion.

Sub scientists believe that World War II may bring many new advancements in sub design. Already James Hogg, an Alhambra, Cal. inventor, has a working model of a 4,000 ton sub that will be able to release 2,000 tons of highly inflammable fuel, which will rise to the surface and burst into a 50-foot sheet of raging flame consuming all ships and harbor facilities over a tremendous area, while the submarine itself would remain immune to the flames.

So far the Allies have never had great occasion to use their submarine fleet—a fleet that equals in quality and quantity that of the Axis. But now the acid test is near. American and British subs must bear the brunt of sinking no small part of the Jap fleet. To do this will mean submarines and more submarines at eight million dollars apiece; so buy defense bonds and stamps now!