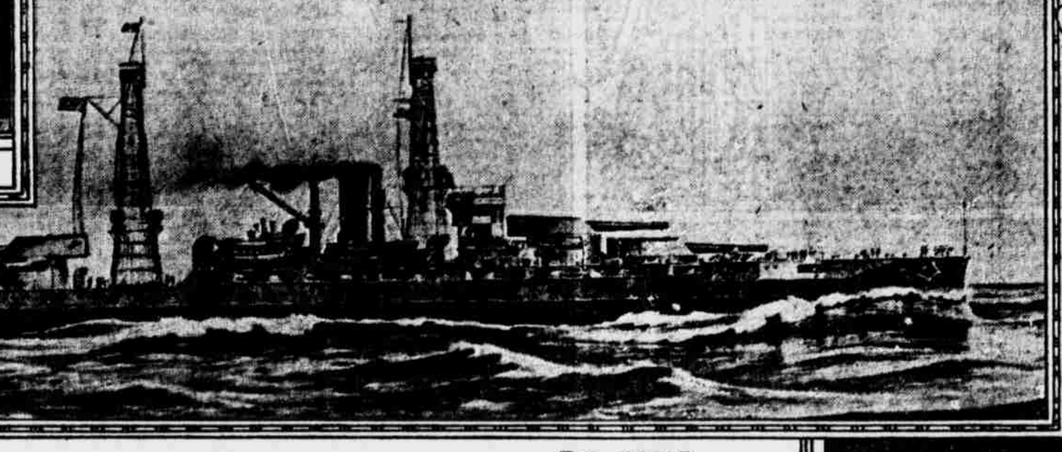
The Tennessee, a Naval Marvel, Ready to Join Our Sea Forces

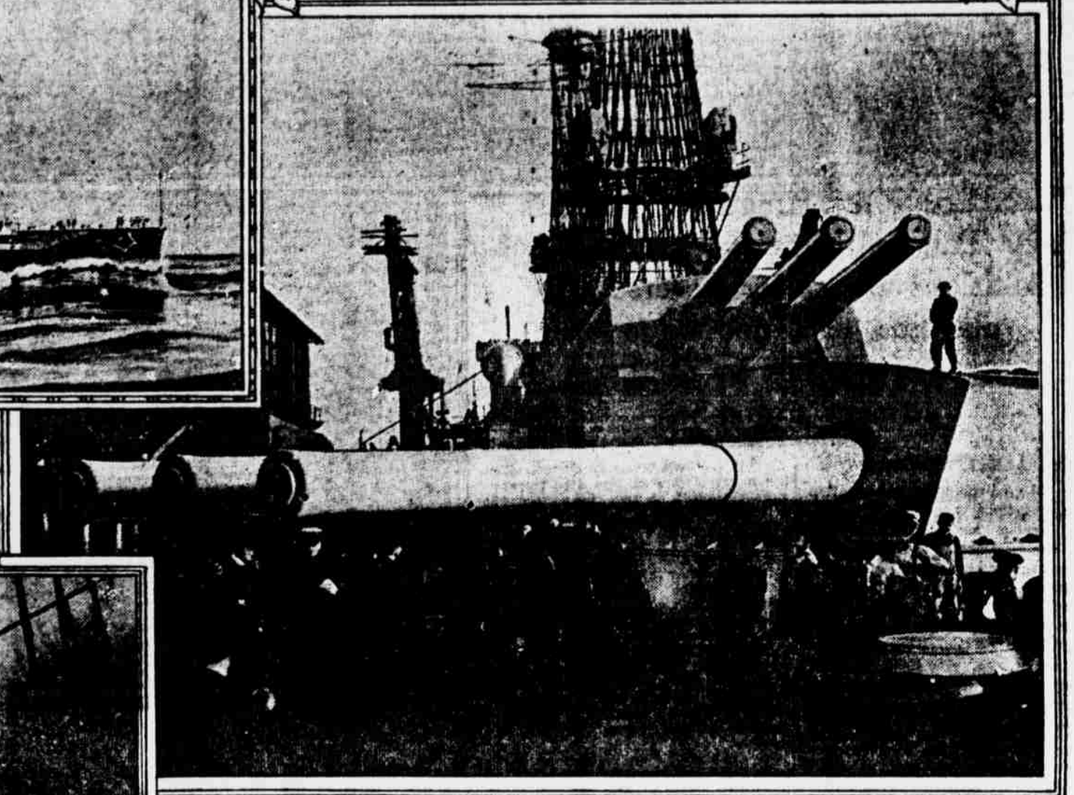
GIANT POWDER CHARGE of 400 LBS. of SMOKELESS POWDER.

THE "TENNESSEE'S" MAIN BATTERY WILL CONSIST of TWELVE 14-INCH GUNS, THREE in EACH of the FOUR TURRETS. EACH GUN WILL HAVE AN OVER ALL LENGTH of NEARLY SIXTY FEET.



THE GREAT SUPERDREADNOUGHT, "TENNESSEE" as SHE WILL LOOK COMPLETED

FINISHING THE "WEDGING UP." ONLY the SAWING of the SOLE-PIECE, and BREAKING the BAPTISMAL BOTTLE on the SHIP'S STEEL STEM INTERVENE BEFORE the GREAT CRAFT SLIDES WATERWARD



THREE GUN TURRETS LIKE THESE WILL GO ON the TENNESSEE

Superdreadnought, Scheduled to Take the Water This Week, Largest and Latest of Floating Fortresses—The Sixth Ship of Her Name, She Will Be the Queen of the Fleet

THE great superdreadnought Tennessee, the latest and largest of our navigable fortresses to near completion, will be launched from the New York Navy Yard next Wednesday. How many realize the significance of that event?

Here in the metropolis we have grown used to engineering tasks of titanic proportions, but from a technical point of view none of these lay quite the same burden of responsibility upon the shoulders of the guiding executives as does the momentous problem of shifting a great ship from the shore and safely into her designed element. In the course of the last few years our naval constructors have put overboard from the neighboring Government yard a number of gigantic craft of increasing magnitude, each weighing many thousands of tons at the time of the transfer, but now we have come to a climax totalling a deadweight burden of 15,000 tons!

Picture a structure 624 feet long, almost 97½ feet wide and reaching from the keel to the line of the main deck to a height of fifty odd feet, and one gets an approximate idea of the mass of this ponderous fabrication of steel. But this does not begin to give to the lay mind a notion of the weight of that cunningly assembled body of plates and angles and channel bars. Ton by ton these structural elements have been put together upon a line of regularly spaced blocks of sturdy timber, and other supports, in the form of loglike shores, have been canted into place beneath her spreading bilges to steady her upon a seemingly precarious and certainly narrow temporary foundation.

Now comes the very ticklish job of transferring this towering, ponderous bulk from the building blocks to the launching ways, and then moving her onto the bosom of the East River without straining the structure or starting a rivet anywhere.

Where the Risk Lies.

To a large extent a ship when building is virtually in the same condition as a person lying prone with his entire weight centred upon the thin edge of a plank, but with this decided difference: the man's spine can bend without serious consequences, while a corresponding flexure of the keel or backbone of the vessel would mean deformation and probably her ruin. It is for this reason that the task of getting the big craft from the land to the water is one involving great risks lest a sudden failure of something invite disastrous strains.

Now it is easy to grasp why the constructors must be very sure of the ground upon which the slip is built and on which the blocks are laid upon which a superdreadnought is to be reared. The foresight of our naval experts in this respect has been established in the cases of the dreadnoughts that have been wrought at the New York Navy Yard; and to-day they have come to the stage of assembling the launching ways which are to carry the Tennessee out upon the high spring tide that will flood the East River next Wednesday.

In anticipation of this the launching ways have been ready for some time. They have been fitted in place, taken apart, oiled, and then purposely exposed to the weather that they they might season and be reliable during the brief period of the supreme test. They are now being expertly reassembled under the ship, and every joint must fit exactly and every bolt must lie snug lest a stray head or a sprung seam invite an accident.

The launching apparatus is an inclined fabrication consisting broadly of groundways and sliding ways. The groundways, which are virtually two broad, well greased tracks of very heavy planks, reach beyond the shore line and run some distance out under the water. The sliding ways, which are much shorter, are made just long enough to provide for a proper distribution of the Tennessee's weight over the bearing surfaces of the groundways and to accommodate the poppets and cradle which fit snugly under the curving body of the superdreadnought.

The groundways are coated with a lubricant composed of beef tallow, soft soap and oil, and this mixture is stabilized by another ingredient which keeps the stuff firm so that it will not ooze out when subjected to pressure or run away if the weather should take a decidedly warm turn. Something like 15,000 pounds of this greasy compound has been spread on the groundways.

The sliding ways have for a foundation a series of heavy planks or timbers similar in dimensions to those of the groundways. They are carefully and strongly bound together by lacings of chain and rope and yet sufficiently flexible to accommodate themselves to the slightly arching surfaces of the groundways. The sliding ways are held from slipping sidewise—from going off the track, so to speak, by ribbands of heavy planking secured to the outside edges of the groundways. On top of the lower or foundation course of the sliding ways is laid another line of strong timber, and between these two courses are placed many hundreds of white oak wedges. These are the comparatively miniature instruments by which the ponderous craft is actually raised enough to release the building blocks and to permit their removal shortly before the vessel glides waterward.

The Last Ties to Shore.

Above the upper course of the sliding ways are set the cradle and the poppets which grip the ship when her weight is transferred to the launching ways and steady her during her run to the river. At the forward ends of the launching apparatus, i.e., under the bow of the Tennessee, the sliding ways are bound to the groundways by two heavy pieces of white oak which are called the sole pieces.

These sole pieces are the last ties which hold a vessel to the shore, and to release the craft these timbers are cut through by sawing. However, because of the tremendous mass involved and to guard against the premature launching of the ship, should the sole pieces fail to hold her, the naval constructors have devised an ingenious and very strong triggerlike tripping mechanism. This is operated hydraulically, as are also two big rams at the bow which will start the vessel upon her way if she shows any reluctance to move of her own accord after all the binding ties have been purposely cast free.

On the day of launching, the supporting shores, which have so long steadied the Tennessee during her building will be knocked away and then the keel blocks must be removed. Then it is that the oaken wedges play their part. With the order to "wedge up" given, gangs of men with battering rams will hammer away at their respective series of wedges in a lusty spirit of rivalry. Little by little, the wedges will be forced inward between the two courses of the sliding ways and gradually the great superdreadnought will be raised bodily clear of the keel blocks and her load transferred to the launching structure. This work of wedging will be done simultaneously on each side of the craft and along the entire length of the sliding ways.

With this work finished the keel blocks are knocked out of place and tumbled to the ground so that they will not obstruct the vessel as she moves toward the river. To safeguard the men during this time, heavy safety chains bind the sliding ways to the groundways. When the last man has come out from beneath the vessel then, and only then, will these chains be cast loose.

The Critical Moment.

It is the usual custom in launching naval craft, especially large ones, to send them into the water stern first. This is because the fuller form of the hull aft tends to make the vessel rise more quickly from her initial plunge than would be the case if she were sent into the water with her sharpeg bow first. Further, this procedure makes the pivoting stress less at the instant when the bow on entering the water and the stern upon rising throw the burden of the ship's weight upon the forward poppets by which the flanking sections of the sliding ways and cradle are tied together. This is the most critical moment in any launching, and if the vessel have not sufficient stability in her light condition and the poppets be unequal to the tax thus suddenly placed upon them the ship may lose her balance, turn over and perhaps sink.

When the Tennessee is safely afloat on the East River Capt. George H. Rock and his assistants of the construction corps will be justified in breathing great sighs of relief. Weeks have been spent in carefully calculating for every contingency, and an error in those figures might easily wreck the massive structure upon which so much money and labor have already been spent. The men responsible in the present instance are past masters of their art, and we can confidently look forward to the Tennessee sweeping majestically from her lofty foundation and out upon the swirling tide without a single hitch.

The Tennessee was authorized by act of Congress approved March 3, 1915, but her keel was not laid until May 14, 1917. She is a sister ship of the California, which is now under construction at the Mare Island Navy Yard.

From stern to the tip of her projecting clipper bow, the monster craft is a little more than an eighth of a mile long. When ready for sea her full load displacement will be 32,600 tons—substantially double that of the dreadnought South Carolina appropriated for just ten years earlier to a day. Such is the advance achieved in a decade.

Speed Estimated at 21 Knots.

The Tennessee will have a battery of eight big boilers, capable of generating steam at a pressure equal to that of an express locomotive and in sufficient measure to develop a total of 28,000 indicated horse-power in her propelling mechanisms. She will burn liquid fuel instead of coal, and her tanks will be ample to give a normal capacity of 1,900 tons of oil. Her radius of action will, therefore, be a wide one, because each long ton of fuel oil will be the steam raising equivalent of 1.6 long tons of coal. It will be infinitely easier, therefore, to handle her fuel and maintain her boilers at their maximum working pressure. At full speed the Tennessee should make not less than twenty-one knots an hour.

As in the case of the New Mexico, which is a wonder in marine engineering, the Tennessee will use her turbines to operate dynamos, and the electric current so generated will be fed to motors connected directly with propulsive shafts and their multiple propellers. In this way the greatest efficiency and economy will be obtained from the steam turbines and a flexibility of control secured through electric drive which would be out of the question if the turbines were linked with the propeller shafts by reducing gears, as has been the practice uniformly abroad and to a large extent here until recently.

Because of urgent wartime work the building of the Tennessee has been delayed, but even so her constructors are confident that she will be ready for commissioning early next year. Considering the size of the craft and the complicated nature of her get-up this is something of which we may well be proud.

The fact is, that every effort has been made to speed up operations and to get the Tennessee overboard so that the keel of battleship No. 50 could be laid on the same slip.

Perhaps it is just as well that the beginning of the construction of the Tennessee was postponed, because our naval experts have taken advantage of lessons learned during actual strife and the ship has been considerably altered from her original design. These changes are mainly inside of her and bear directly upon elements of increased protection against subaqueous attack or injury.

The Tennessee's Battery.

To make her fit to hold her own in the forefront of the battle line and to hammer away at a distant foeman worthy of her mettle, the Tennessee will carry twelve 14-inch 50-calibre naval rifles, so mounted in the four triple gun turrets that the pieces can be elevated sufficiently to give them a range in the neighborhood of 20,000 yards. We have heard of the 15-inch guns of certain British battle craft, and the popular idea probably prevails that the added inch of bore means a superior weapon, but our ordnance experts have declared that our 14-inch rifle is a much better instrument of destruction than the rival British 15-inch piece.

Admiral Sims has said: "There is no armor afloat to-day that cannot be pierced by a 14-inch gun at battle ranges." And it seems that a 14-inch shell, at a distance of 18,000 yards, will bore its way undeformed through a solid wall of nearly nine inches of hardened steel and burst behind that barrier with tremendous destructive violence.

It will be possible for the Tennessee to concentrate on either broadside all twelve of her master weapons and to hurl at a single salvo a total of 16,800 pounds of projectiles charged with high explosives. Just how good our gunners are was established recently during target practice in Southern waters. Admiral Mayo's navigable fortresses, steaming in battle formation at distances up to nearly 22,000 yards, time and again put down a salvo right on the target—salvos that would have smashed into helpless hulks any opposing craft that could be mustered to-day.

In addition to her main battery the Tennessee will carry a secondary force of fourteen five inch rapid fire rifles, four six pounders and four anti-aircraft weapons. She will also be equipped with two submerged tubes for the discharge of big, long range twenty-one inch torpedoes. It is not permitted to give the details of her armor protection, but we are assured by the authorities that this is of such thickness and spread as to afford a formidable defnce against the assaults of enemy shells.

The name Tennessee has come to our navy list as a token of victory. None of the national fighting fleet was so distinguished prior to the civil war, but then the fate of battles brought three vessels of that name under the dominance of the Federal forces. The first of these was a side wheel steamer carrying five guns, which was captured by Farragut's fleet at the taking of the city of New Orleans on April 25, 1862. Her name was subsequently changed to Mobile and for some time Admiral Farragut used her as a light draft tender to the Hartford and carried his flag upon her where he could not navigate with the heavier craft.

The second Tennessee was a formidable ironclad which was captured when the Federal forces took Memphis in the spring of 1862. She was then on the stocks and was purposely destroyed by fire where she stood.

A third and more powerful Tennessee was the Confederate armored ram which figured so conspicuously in the fateful battle of Mobile Bay. It virtually took the concentrated fire of Farragut's entire fleet to hammer that menacing and mighty craft into submission. After her capture on August 5, 1864, she was commissioned in the United States Navy and was sold in the latter part of November, 1867.

The fourth Tennessee was built at the Navy Yard, New York, and was launched there as the U. S. S. Madawaska on July 8, 1865. She was, as first designed, a potential failure, but was subsequently modified in 1869, when she was renamed Tennessee and modelled into a first rate wooden frigate of 4,840 tons displacement. She was converted into a full rigged ship and under steam alone was capable of making nearly fourteen knots an hour. She proved in service to be a fine sea boat and was a general favorite in the navy because of her roomy and comfortable accommodations. She was sold in September of 887 for $34,525, although up to 1869 she represented an outlay of $1,673,080.

The fifth Tennessee was the armored cruiser which was launched in 1904. This ship was renamed Memphis in May of 1916, after the authorization of the present superdreadnought, and was wrecked in the harbor of Santo Domingo on August 29, 1916, when a tropical storm and a tidal wave caused her to snap her chain cables. She was swept onto the coral reefs and wrecked.

When commissioned the superdreadnought Tennessee will have a complement of 1,083, including officers, sailors and marines. The South Carolina, on the other hand, of little more than half the new ship's displacement, has a personnel of 815. The comparatively moderate increase in the complement of the Tennessee over the earlier dreadnought is illuminating. It shows how, despite magnified size, greater speed and a more formidable array of great guns, engineering cunning and the wider employment of electrical auxiliaries make it possible for relatively fewer men to handle efficiently this later product of our naval experts.

New Yorkers well may glory in the coming launching of the Tennessee. The event emphasizes not only the constructive capacity of the local Government yard, but it evidences how far we have been able to outstrip the rival establishment on the Pacific side of the continent, which is engaged in building the sister ship, the California. The California will not be ready for the water before the fall.

Legends of Strange White Races

THERE has for many centuries existed in the minds of many civilized peoples a curious fascination with reference to the idea that in remote parts of the tropics amid the dark skinned races there flourish mysteriously isolated white tribes bearing a strong resemblance to the civilized branches of the Caucasian race.

The early adventurers in Central and South America brought home many tales of extraordinary cities beyond the mountains, and vague stories afloat in South Africa some forty-five years ago furnished Rider Haggard with a theme for one of his novels.

Legends like these are met in almost all the less explored regions of the world, and they have always certain features in common. The isolated white people almost invariably inhabit a mountainous region in a vague interior, always "just beyond"; they hold aloof from the surrounding races; they are seldom seen, and yet are definitely stated to be more civilized and better educated than the darker masses whom they avoid.

Who they are and whence they came no one knows; native fables afford no explanation. Once it was thought that forgotten white explorers might have built up unknown kingdoms in the wild places of the earth, but upon examination these theories vanish as rapidly as do the white tribes themselves, and the ultimate explanation is almost prosaic.

Yet so strong a hold has the idea gained that even in the beginning of the twentieth century the possibility of the existence of genuine white races is not altogether scoffed at. Less than fourteen years ago an American officer engaged in the operations against the Moros in the Philippines collected apparently substantial evidence relating to a mysterious white tribe in the Island of Mindanao. The mountainous district in the centre of this island has never been explored and even the coast is not well known.

But along the seabord many stories are told of the fierce white people who have their home in the forest clad mountains of the interior. Eye witnesses depose to having seen a strange fair complexioned girl, who fled toward the hills as soon as she was addressed. Other men and women of a light complexioned race are said to have been seen by more venturesome natives who were bold enough to approach the wild mountain district. The American officer was so impressed that he determined to conduct an exploring expedition across the centre of the island. But apparently the mysterious white folk had vanished, for the world has as yet heard nothing of his search being crowned with success.

Arabia, however, can with more reason boast of a white tribe. For years stories of such a race have been told in the Persian Gulf, and an American missionary stationed at Muscat alluded some years ago to "coffee house babble in eastern Oman concerning a mysterious race of light complexioned people who live somewhere in the mountains, shun strangers and speak a language all their own."

Various theories have been propounded to explain the fable, but probably the explanation is to be found in the narrative of a journey made to Oman in 1876 by Col. S. B. Miles, a British officer. Col. Miles in the course of his travels came across a town named Sheraizi, in the heart of the Green Mountains. This strange place was perched like an eagle's nest on the top of a great cliff, and was inhabited by people of lighter skin than the rest of the tribes in the interior. They rarely descended to the plains and refused to mix with or intermarry with the Arabs.

Col. Miles found they were descendants of a portion of the Persian army that invaded Oman in the fifth century. The isolation of the town and the curious behavior of its people gave rise to exaggerated stories in the bazaars on the distant coast, and in this case the origin of the fable may be regarded as fairly certain.

Unfortunately for the romance of the world, it seems practically impossible for stories of this character to have the origin novelists would wish. The world is comparatively small today. The trail of the explorer is over every land from Paraguay to Tibet. Forbidden lands are entered, hidden cities exist only in the imagination of the fiction writer. In a period when trains run to Bokhara and the great African lakes; when the tourist appears at Khartum, and Lhassa itself is entered, there is no room for a mysterious white race. Even the dark continent is no longer allowed to have its mysteries. The photographer sits on the battered walls of Kano; the Fulani emperors have passed away.

One may no longer believe in the existence of a strange white people in Africa. Rider Haggard's splendid race is probably only the Bahima, originally discovered by Speke in southwestern Uganda. At least Sir Harry Johnston claims to have discovered in them the clue to many of the mysterious white race legends found in the dark continent. He was engaged in nothing more thrilling than a tour of inspection of Ankole when he came across them. They are of a very light complexion and are the aristocrats of this region. Sir Harry holds that they are obviously descendants from a Gala, Somali or other Hamitic stock, and adds that some of them are more like Egyptians than is the case with Galas and Somalis. Romance disappears before the tread of the explorer. The Dark Continent is dark no more.