

TO THE NEW YORK TIMES  
VIA THE NEW YORK TIMES WASHINGTON BUREAU  
FROM ROBERT TRUMBULL

REPAIR: IV.

PEARL HARBOR, Dec. 18 (Passed by naval censor)---When the subject of the USS West Virginia is mentioned to the men who worked on her salvage, they seldom say anything. They just whistle.

The Japs on Dec. 7, 1941, left this \$27,000,000 beauty a model for destruction. It will be amazing and disheartening to them now to learn that she will return to the war a better ship than she was before.

Rear Admiral William R. Furlong, commandant of the Pearl Harbor Navy Yard, pulled out a bulging manila envelope of pictures when the writer and Keith Wheeler of the Chicago Times requested details of the damage and repair of the West Virginia.

"Look here", Admiral Furlong said, pointing to the West Virginia's hull. He showed a long section welded in to replace the dark, ragged cavern blasted out by Japanese torpedoes. The new side was spotless, and smooth as the glossy paper the Admiral held in his hand. The old hull, he reminded us, had been riveted---a style that is passe' in this age of streamlining and economy of weight.

The West Virginia's 31,800-ton mass lay deep in the water when the Japanese flew away on Dec. 7, 1941. She listed far to port her starboard bilge hooked into the adjacent battleship

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Tennessee---~~a circumstance that prevented her listing even more.~~ *delete name adm Furlong. She was resting on bottom*

~~Seven~~ Eight torpedoes had hit the West Virginia on her port side, blowing out a series of gashes above and below the armor belt 120 feet long and so wide from lip to lip that two tall men could stand, one on the other's shoulders, in the vent.

*This was after rough action*  
The boat deck was a shattered mass. Bombs laid open four decks the way an earthquake might tear away the wall of a four-story building, leaving the rooms indecently exposed. Up on the bridge Capt. Mervyn S. Bennion had lain grievously wounded, refusing to be moved and there he died. Posthumously he was awarded his country's highest honor, the Congressional Medal.

The ship's plaque naming all her commanders has been salvaged, and under Capt. Bennion's name Admiral Furlong had a line engraved, "Killed in action.....Pearl Harbor". Back in the list of captains is the name of William R. Furlong, skipper in 1936-37, and before that executive officer. <sup>1946</sup> The plaque hangs again aboard the gallant West Virginia. *with him down flag*

Japan's dive bombers did their work well on the West Virginia. The heavy bomb abaft the bridge, that had damaged all the upperworks, had pushed one deck clear down upon another, and a five-inch gun in a rended casemate fell a full deck below, as if sprung from a trapdoor.

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The heavy armor belt showed the marks of six torpedoes. Another tore into her vitals under the stern, breaking the rudder and the giant steel castings that held the ~~stern posts~~ <sup>rudder or stern</sup>.

*board to get anyone to cut them.*

Inside, the West Virginia looked as if she had been crumpled like paper in a giant hand. Such damage as fire can do was <sup>on the side</sup> everywhere. To top it, her bottom was wrinkled where she struck the <sup>bottom</sup> floor of the harbor.

When the engineers went to work on the West Virginia, almost the only point in her favor was the fact that the ship was not capsized. Neither of the methods used to raise the Nevada and the California would do in this case, because the great slash in her port side was too large for any patch. Delicate matching of the timber frames to the lines of her hull was out of the question, for the sides of the ship had writhed in their agony, and she no longer fitted her blueprints.

But the engineers found the cofferdam principle still workable, with a remarkable variation as to the method of making them watertight. Because of the grotesque irregularities in the ship's tortured hull, it would be impossible to seal them at the bottom by ordinary means.

The huge cofferdams were built, huge wooden sections braced with steel. They were lowered, bolted to the hull as <sup>on other ships</sup> before, and meeting so as to form one tremendous outwall. The cofferdam was further secured by long steel rods running vertically upward from their attachments inside the timber structure to "A" frames fastened to the deck above.

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The support from the top was given by frames of steel "I" beams, from which the cofferdams hung as from a coat-hanger.

Now for the troublesome problem of sealing at the bottom, where a snug fitting of the wood was impracticable: Hundreds of tons of tremic concrete was poured from hoppers into funnels high above the water. This quick-setting cement, which hardens under water and gets its name from the French word for hopper, oozed through thick pipes and formed about the West Virginia's uneven crevasses far below. It hardened and made the cofferdam part of the ship, watertight.

As the pumps strained to suck out the fouled sea inside, the West Virginia rose, inch by inch. Each new day disclosed a new surface-ring of oil and black muck from the harbor bottom marking on the cofferdam the laborious progress of the ship's flotation.

There followed a period of heartbreak amid the indescribable filth only to be found in a ship that has been blown to bits between decks and left to the mercy of salt water for months. During this annoying time, the workers lived close ashore in rude huts built for them so they could stay near the job.

They came to work on foot, over a bridge laid on floats. These were sailors all. The "yard workmen", civilians, had their customary quarters elsewhere, and were taken to and from the ship by boat.

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*Substituted  
to work on  
the ship &  
repairing  
with pumps*

*Some mostly but own crew, some from other ships*

*Working off balance, water to the  
rough work leaving off.*

*Building of 40 ft long  
bridge over water*

*Workers with...  
the work...  
the work...*

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When the time came to nurse the West Virginia over the sill and into drydock, the engineers held their breath, for the battleship now was in great danger of striking some small obstruction that would rupture her again.

On the keel blocks, the West Virginia had to take rough treatment to remove the concrete. The only workable way was to blast it out with small sticks of dynamite.

This done, the job before Admiral Furlong's big and hard-bitten organization could be stated simply, but the implications were staggering. They just had to rebuild a large portion of the ship. Still, they had considerable foundation for the new construction, for the seams---where the torpedoes had left any hull at all---were opened only slightly.

Today, the West Virginia's port side has been renewed, half of it new material. Behind the outer hull, considerable rebuilding has taken place. In many parts of her, the West Virginia is a new and better ship.

An incidental point of interest is that the West Virginia yielded to the clean-up crews a fine reservoir of powder that conceivably will be used to propel missiles at the Japs. The powder was not in usable condition when recovered, but was suitable for re-blending.

Admiral Furlong dwelt, with reason, on the repair of the West Virginia.

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"The spectacular salvage is re-floating", he said. "The hard work is cleaning up, then the repair."

This job was to be immeasurably more difficult on the West Virginia than it has ever been found elsewhere.

The compartments below decks were half-filled with rubble--rotting stuff that exuded an over-powering stench. Discoveries odd and gruesome were frequent as the men set about righting and cleansing the charnel. This work was arduous and discouraging, but the work crews, supervised by the West Virginia's own officers and men who treated the maimed battleship as a mother would tend a sick child, carried on.

There were instances of heroism in the salvage that deserve to go permanently into the annals of Dec. 7. One day an unexploded 1,750-pound bomb was discovered, held in a section of steel that it had penetrated. An officer risked his life to unscrew the live fuses.

Another time the workers came upon the uninjured air flask of a Japanese torpedo. The officers spent an uncomfortable time searching for the war head. They came to the conclusion that it had dropped off before the fish entered the ship. This torpedo, weirdly, was encircled, when found, by one of the ship's barber chairs.

Workmen prowling the ruins below decks made several tragic discoveries of the type that can only be expected when a city of more than a thousand men is hurled to the bottom of the sea in a space of minutes.

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The West Virginia's larder was well stocked on Dec. 7. The refrigeration tanks belched hideous gases when air was again let in to the rotten food. Carrying this mess topside and loading it onto barges was a noisome task.

Clothing and other personal belongings were sorted when possible from the wet and stinking gobs of refuse, to be tagged if identifiable.

The electrical equipment, with its hundreds of miles of wiring, was also brought on deck and cleaned preparatory to overhaul. Some fifty specialists from the General Electric Company, which had built the motors and generators, were brought from the Mainland for the complex <sup>of armature re-wiring</sup> re-wiring. The tax-payer may rest assured that the Navy isn't throwing away anything that can be fixed.

Summing up the West Virginia job, Admiral Furlong said:

"We built her new from the inside out. We went right to the bottom, like a dentist drilling out a rotten tooth, and we burned away all the damage, then renewed the hull and decks."

The Admiral paid the highest tribute to the yard workers of the Industrial Department, the plumbers, carpenters, copper-smiths, tinsmiths, artisans of every kind, who labored untiringly with Lt. Henry P. Rumble, the superintendent on the spot.

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In the later stages of the West Virginia's reclamation the men lived aboard, and for a while, she was the flagship of a temporarily homeless admiral.