

The Oberon Experiments.

The sixth attack upon the *Oberon*, target ship took place Nov. 11th, in Stokes Bay near Portsmouth. The *Oberon* was moored in her usual place off Fort Monckton, where the firing party were stationed, and all the details of the trial were freshly prepared. The submarine mine, consisting of a wrought iron cylindrical case, containing 500 lbs. of Abel's discs wetted, was suspended from the end of a spar projecting from the ships starboard side 30 feet, and submerged 48 feet—the absolute distance from the outer skin of the hull being thus 52 feet, the depth of the sea being about eleven fathoms. All the details were precisely the same as on the previous occasion, with the exception that the primed charge of dry gun cotton was increased from 1 lb. to 2 lb., and the increase of detonating force certainly appeared to have its value—for the explosion was the finest of any yet observed from a like charge. As seen from one of the dock-yard tug boats, at about 100 fathoms away from the starboard quarter, the explosion presented magnificent effects. A stiff breeze was blowing, with a bright sky, and the frosty temperature made the fingers tingle, and freshened life within one into healthy vigor. Steamers and craft flitted about as on regatta days. The sound of the bugle presently floated over the sparkling sea and drew attention to the devoted ship. All eyes were intently fixed on the spot of the anticipated principal but evanescent object of the picture. Soon a sharp thud was felt, and immediately there arose close to the *Oberon* a great dome of green water, swelling unbroken until it reached the overhanging spar; then out of it jetted a massive fountain near as high as the *Oberon's* flag staff, and out of this again there burst a magnificent dark colored geyser, ragged and rugged in form that foamed high into the air, and snowy, white and fell white and mediate between the first green dome and the sides of the ship, and intermediate between it in time and the first fountain, there was a great spurt of spray as if the water between the explosion and the *Oberon's* hull had been bodily jerked out. Some idea may be formed of the height of the great geyser by the fact that its visible height was at least three times the height of the mast-head above water: that is to say, mast above deck 72 feet, deck above water line of ship about 13 feet, total 85 feet to truck. The height of the geyser, therefore, would be above 250 feet. When the water from the outburst of the explosion struck the *Oberon* she seemed to rise and move over slightly, and for some minutes there was a run back of water over her sides from the downpour of the geyser. Quickly the tugs were along side, and a boarding party of riggers was thrown on board. The pumps were immediately sounded, and it was quickly made clear that no leaks were sprung. By about one o'clock the *Oberon* was in dock, and by three the water had left her dry and the extent of damage to the outer skin was made plain. It was, indeed, very slight, although it extended over the whole immersed surface of the ship's exposed side from the bow to the ninth vertical frame, a length of about 35 to 40 feet, and from the keel to waterline. The plates were bent in, say three quarters of an inch at the utmost from their proper outline between the frames: but otherwise there was neither opening of the seams nor of the caulking. On board there was less disturbance than on some previous occasions: all the movable objects were dis-

placed in the fore compartments, but the extent of disturbance rapidly diminished towards the after part of the ship—the torpedo having been exploded well in front of the starboard bow. Besides the 500 lb. mine there were three subsidiary charges placed at distances of 100 feet away and 100 feet from each other, namely 50 lb. of Abel's gun cotton in a net; 50 lb. of Abel's gun cotton, wetted, in an iron case made for a 100 lb. charge, the interspace being packed with wood; and the third charge made up of two 25 lbs. of dynamite in tin cases. These were all submerged ten feet below the surface, and the object was to see if the grand mine would explode them. The result was that the buoys which marked there whereabouts were washed about a good deal, but beyond this no effect was produced.

The details noted on board by careful examination were:—Compartment No. 1 (Bow)—On starboard side on lower deck, second knee started, so that a chisel blade could be inserted between to and the under side of the deck; ladder thrown down; one iron midship stanchion loosened; a 1 inch bolt head off from second port knee and another bolt loosened. Below this deck the second beam was slightly sprung; and from the third beam there was half a dozen similar bolt heads off. In No. 2 compartment, in the space below the lower deck, there was one half inch bolt head off from port side of the centre of the first deck beam; one off from second beam on starboard half; top barrels, filled with water, slightly shifted. On the lower deck the ventilator covers were displaced on starboard side, being jerked to port nearly a yard; strut to fourth beam on starboard side shifted 1-4 inch. On deck, the cable bit arm, a large piece of timber 12 inches by 20 inches in section, and 10 feet long, was displaced to the extent of six inches away from the bit to its port end. In the third compartment on the lower deck, the two water tanks were violently displaced; the iron water tanks were thrown down; the iron water tanks were displaced; and two of the 4 inch struts in starboard portion of cabin had been forced upwards, so as to start the deck planks above them; one strut broken and lying on starboard side of lower deck, at six feet abaft the foremost bulkhead, the iron covering or outside ledge of the double bottom was separated 1-16th inch over a short distance. A timber strut, 8 inches by 6 inches, stretching from foremost bulkhead to third beam, was started 4 inches; the foremost iron stanchion, 2 1/2 inches in diameter, was thrown down; the struts generally displaced, as also the iron water tanks, and all movable objects; and, lastly, the great transverse wood beam above the aftermost bulkhead was lifted vertically, showing a crevice in some places 3-4 inch wide in the gaps. Of the 1 1/4 inch mooring chain cable, two lights, one about 6 feet and the other 10 feet, were thrown down the hatchway. This massive chain must have been jerked upwards at least three inches. On deck the spar which suspended the torpedo had been broken off at six feet from the ship's side, and the remaining portion overboard had a split ten feet long from the broken end. The two inch wire rope shackle, or 3 inch iron ring, which had been attached to the torpedo, when drawn out of the water showed the wire rope frayed for about four feet, and having three out of six strands cut out at the joint with the shackle. In No. 4 compartment there was one iron water tank displaced, three or four of the covers off, and two struts thrown down; the engine room

hatch on starboard side thrown one foot & side after a vertical lift of at least three inches. All the remaining struts shifted. In No. 5 compartment the after pipe from inlet valve of condenser was leaking a good deal at the top side of the joint of the flanges next the condenser; from these flanges there were four bolt heads broken off. The valve had been left open during explosion; the exit valve had been closed, and there was no injury done to the exit pipe. The condenser had filled while the *Oberon* was at her moorings, showing that the inlet valve had leaked. Therefore, as after the explosion water was not to be found at the top of the condenser with the valves shut down, it follows that the leak at the flanges was enough to relieve the leaks of the valves and to gradually empty the condenser. All the shores to iron ballast tanks were slightly shifted; lids of tanks also displaced. On deck, over No. 6 compartment, the wedges at the foot of the derrick were slightly shifted; down below there was nothing amiss. In No. 7 compartment there was no damage whatever: light things only displaced. In No. 8 compartment a wood stanchion was thrown down and broken along the line of previous split.

Taken altogether, the damage is not, as we have said, so severe as on former occasions. This is mostly due to the fact of the exploded mine having been buoyant. In former cases the mines were on the sea bottom. Looking at the general results of this very important experiment, one may consider submarine mines much more calculated to scare than to destroy; and indeed, it is now questionable whether with 500 lb. mines the distance will not have to be reduced to something like 10 feet before serious injury would be effected on the *Oberon's* double bottom; if so in large and heavy vessels, little damage would probably be done to their massive machinery. Nothing but hugging contact will, in the end, we are sure, as we have always contended, be thoroughly effectual in warfare. The present experiments are being made on the starboard side of the target ship, the port side being reserved for the *Harvey*, *Whitehead*, and boat torpedoes, and this second series will be exceedingly interesting. The crusher gauges suspended over the *Oberon's* side at 15 feet depth gave the highest pressures ever as yet obtained.

The *VOLUNTEER REVIEW* contains a whole series of articles on *Torpedoes*—we have to add now the result of the sixth experiment on the *Oberon*—and the conclusion we have long ago arrived at are abundantly confirmed. There is no need to point out what condition of success are necessary for submarine mines, they are not as effective as land mines nor can they be made so.

According to a telegram from Calcutta yesterday, the Government is satisfied that that the Gwalior prisoner is not the Nana. Scindiah admits he was mistaken, and it is uncertain who the man is or what will be done with him. The rumoured disaffection of Scindiah's troops is untrue. From Afghanistan it is reported that Yakooob Khan is closely confined in the Palace, that the Amcer has not yet answered the Viceroy's remonstrance, and that the Government does not anticipate any necessity for interference.—*Broad Arrow*, 5th Dec.