

EXPERIMENTS ON THE RESISTANCE OF SHIPS' DECKS.

From the London Standard.

An experiment of a very important character has recently been made at Shoeburyness on the resistance of ships' decks to projectiles. A target 20 feet by 10 feet was formed with six iron deck beams, 10 inches deep and 2 feet apart, covered over one half by a deck of one-inch thickness of iron-plate—namely, two $\frac{1}{2}$ inch plates, and this again planked over with 5 inch thick deal planks 8 inches in width, and secured to the iron by $\frac{3}{4}$ -inch bolts tapped into the plates, the other half of the target being covered by $\frac{1}{2}$ inch iron-plate in two thicknesses of $\frac{3}{4}$ -inch planked over with wood $4\frac{1}{2}$ inches thick. The 13-inch sea-service smooth-bore mortar, and the 4 ton 9-inch rifled howitzer, were placed at twenty yards in front of the target, and directed so that the projectiles should strike with an angle of incidence of sixty degrees. The mortar threw spherical cast iron common shell, filled with sand, to a total weight of 207 lbs.; and the 9-inch howitzer, cylindrical cast-iron common shell, similarly filled to the total weight of 240 lbs. Four rounds were fired, two against each division of the target, with the charges of 7 lbs. and $3\frac{1}{2}$ lbs. of L. G. R. powder, the one representing the maximum terminal velocity which, in the case of the 13 inch mortar, would be a striking force of about 520 feet per second for a shell thrown, say 3500 yards, with the mortar at forty five degrees and a 20 lb. charge. In the other case the striking velocity would be about 300 feet per second as at, say 1000 yards range, with the weapon at forty-five degrees elevation, and fired with the proper service charge for that distance. The practice was as follows:

Round 1. From 13-inch mortar against the 1-inch plating portion, with 7 lb. charge. The spherical shell struck on the sixth plank counting from the proper right, 4 feet from the side of the target and 3 feet 10 inches from its base, passing completely through and ripping out a squarish hole, the width of two planks (fifth and sixth), or 1 foot 4 inches by one foot vertically, and splintering out the fifth plank in front and along the edge of the fourth plank for a distance of 18 inches. The caulking was started for a length of 4 feet between the fifth, sixth, and seventh planks. At the rear the hole was jagged, and measured horizontally 2 feet by 1 foot 6 inches vertically; 14 inches of the third iron deck beam being broken away. No rivets were started, even in close proximity to the hole. The shell broke up in three large pieces, one of which passed out 77 paces beyond high-water mark, or some 150 paces rearward. The 12 inch timbering supporting the target cut about and fractured.

Round 2, With 7 lb. charge against the $1\frac{1}{2}$ -inch plating portion. Struck twenty-fifth plank, or about 4 feet from proper left side and 4 feet 3 inches from base. Hole completely through 18 inches broad, and 13 inches high over one plank and 16 inches over the other; the twenty-fourth plank being splintered out over a distance of 2 feet 3 inches. The caulking between the twenty-fourth, twenty-fifth, and twenty-sixth planks started over a length of 6 feet. At the rear the hole was seen between the third and fourth deck beams, measuring 16 inches by 16 inches, the lower deck beam being slightly bent. Timber support and strut cut about and broken; no rivets started.

Round 3. From 13-inch mortar, with $3\frac{1}{2}$ lbs. powder, and spherical shell, upon $1\frac{1}{2}$ -inch plating portion. The shell did not penetrate,

but crushed out the wood planking, making an indent into the iron plating $8\frac{1}{2}$ inches from plane of surface of target. The shell rebounded all ten feet to the front. The hit was upon the twenty-second plate, twenty-one and twenty three being splintered for a length of more than 2 feet. At the rear was a large bulge between the first and second beams, the joining of the rear $\frac{1}{2}$ inch plating opening across the bulge to the extent of an inch, and the front plate also being cracked so that daylight could be seen through the assuro; the angle iron of the second beam was bent a good deal, and the beam itself cracked completely across its entire depth. The bulge measured 17 inches by 17 inches, 3.3 inches in the centre. The beam was further bulged 1.6 inch over 6 feet of its length.

Round 4, With $3\frac{1}{2}$ lb. charge against the 1 inch plating portion. Hole right through eighth and ninth planks, at 2 feet 2 inches from base; width about 12 inches, widening by the splintering of the planking along the edge of the seventh plank to the extent of 2 feet; the ninth plank driven in $\frac{1}{4}$ inch, and the seventh outward to the like extent. Caulking between seventh, eighth, ninth, and tenth planks started for a length of 6 feet. At the rear the hole presented a very jagged appearance, pieces of the skin 12 inches and 18 inches long being turned right back; its dimensions were 1 foot 6 inches by 1 foot. The second beam at its base cut away for 2 feet 6 inches.

For the sake of convenience and safety of the practice the planking was placed vertically, so that in the above record the vertical measurements represent the length of the planking and of the ship's deck; and the horizontal measurements are across the breadths of the planks; the transverse beams across the ship's deck similarly appear at the rear of the target as horizontal in position.

THE COAL FIELDS OF THE NORTH-WEST.

Sir William Armstrong, some few years ago, raised the question in the old country of the possibility of the coal mines of England becoming, after a time, exhausted. The question was widely discussed at the time, and all became thoroughly convinced of what paramount importance to a country's prosperity was the coal fields. From geological reports and engineers surveys, it appears that the Territory of the Northwest possesses one of the largest coal fields in the world. Between the 59th parallel and the North Sea, it has been calculated that there cannot be much less than 500,000 square miles that are underlain by true coal. On the east it is bounded by a belt of metamorphic rocks, that extend from the Arctic Sea to the North Shore of Lake Superior. The average breadth of this belt is about 200 miles. In addition to the coal this district contains rich deposits of iron ore, and likely gold, as the rocks are of similar formation and of the same age as the gold bearing rocks of Nova Scotia. From the West end of Lake Athabasca to the 49th parallel, between 97° and 98° West London, near Pembina, the coal measures may be traced for about 900 miles, passing down into the States; where, on the Missouri river, the strata are exposed on its banks.

This is a wonderful provision of coal in the North west country, and makes its possession of immense importance to the Dominion of Canada. The scarcity of coals is one of the most serious wants at present felt, and affects every branch of manufactures and industry, as well as the people. At present almost all our coal has to be im-

ported from the States. But with this region properly developed, we may draw our supplies from our own resources, and possibly compete with our neighbors in an article for which at present they hold the complete monopoly.

This measure of working the coal mines of the Northwest, is of such importance to the country in every respect, that immediately on acquiring possession of the country, a railroad should be constructed with all possible speed, and every inducement held out to private Companies to develop these rich fields; and, if private speculators are laggard in seeing the advantages to be derived, it behoves the Government of the country to attend to the matter themselves, so as to put the Dominion in possession of those treasures which are more important to the prosperity and the development of her industries, than the possession of a mine of diamonds. Were such coal mines discovered in European countries there would be but little delay in having them advantageously worked. Let not our people or Government be behind Europe, in a work of such importance to the prosperity of the entire nation.—*Toronto Telegraph.*

MR. CHANDLER ON THE NORTH-WEST.

Mr. Zachariah Chandler, of Michigan, did his best to-day for the championship as Senatorial harlequin. The resolution having been taken up requesting the President to appoint Commissioners to treat with the people of the Red River Settlement this extraordinary Michigander flapping his pinions in the direction of the chops of the British lion with a vehemence terrible though ludicrous, filling the chamber for half an hour with the resonance of his own peculiar rhetoric. "My God, Mr. President," exclaimed and proceeded Chandler in effect, "is that gorged and insolent brute, the Britisher, who owes the United States half the expenses of the late war, to be allowed to gobble up any more territory on this continent? Isn't it the ultimate attitude of impudence for him or even his catspaw, the Dominion of Canada, to talk about getting up an expedition to settle the hash of these Red River people, who want to be annexed to us, who are a hundred and odd thousand strong, and whose government, the Winnipeg government has control over a territory to which that of the Dominion is but a speck on the map? Whereupon the harlequin, shifting his quid, produced an atlas, cried to the Senator next to him, "Howard, hold this up won't you," and while Howard held it up, descanted upon the map of North America to the listening Senators, in the style of a lecturer with diagrams. He showed how enormously big, but took no pains to show how extremely unpopulous, the northern part of North America, supposed to be under the rule of the Winnipeg government, really is; and he went on after the same general style to affirm that it was the mission of the United States to snatch the territory out of the grasp of the Dominion; to "chaw up" any Dominion troops that might be sent thither to take the earliest opportunity to knock the British Crown off the British scalp; to arrange for some one or two hundred thousand British graves forthwith; and to cabbage without any further procrastination this whole boundless continent. Such comical buncombe set everybody around the speaker in a roar of laughter, alternating with a panorama of silent grins. Nothing whatever was done except to quietly drop the matter into the raw of the Committee on Foreign Relations."—*N. Y. World.*