

PRACTICE AT TARGET MADE OF HOGS-HAIR.

REPORT MADE TO BUREAU OF ORDNANCE (NAVY DEPARTMENT) ON SEPTEMBER 1ST, 1863, BY LIEUT. COMMANDER WILLIAM MITCHELL, ON AN EXPERIMENTAL TRIAL OF THE RESISTING QUALITIES OF A HOGS-HAIR TARGET, THE INVENTION OF MR. — BRADY.

Practice at Target No. 44, made of Hogs-hair, on the Plan of Mr. Brady, Pencote Battery, Sept. 1, 1863.

This Target was made of 5 bales of hogs-hair, faced and backed with pine plank 4 inches thick, and fastened with 28 wrought-iron bolts.

Two of the bales had been subjected to one and the same amount of compression, and two others were compressed alike but differing in degree from the former, and the remaining bale, as stated by the inventor, was but slightly compressed. The bales were bound with iron hoops.

The target was backed with 4 feet of solid clay.

Dimensions of Target.—Eleven feet three inches long; four feet wide; three feet three and a half inches thick.

Gun Practice at Experimental Battery, Sept. 1, 1863.

Gun, Rifle, 50-pdr., No. 30, mounted on wooden carriage on Pencote Battery. Charges, 3 1/2 lbs. Schag-ticoke cannon powder. Projectile, J. A. D. Shell. Primers, friction. Officer in charge, Lieut.-Comdr. Wm. Mitchell. Record by Bangs. Aimed at Target.

No. from Gun.	No. to-day.	Charge.	Weight of Projectile.	Insert'n.	Recoil.	Time when fired.	REMARKS.
		lbs.	lbs.	in.	ft.	a. m. h. m. s.	
1	3 3/4	38.	70	"	2.9	10.25	
2	"	36.25	"	"	2.7	10.37	
3	"	37.	"	"	3.	10.49	
4	"	"	"	"	3.	10.58	

1st Shot struck the right hand bale in the center, passing entirely through bale and 4 feet of clay, entering the bank at a distance of 18 feet 3 inches back of target, and imbedding itself.

2d Shot struck the 2d bale from right edge of target in the center, passing entirely through bale and 4 feet of clay, entering the bank at a distance of 10 feet back of target, and imbedding itself.

3d Shot struck 3d bale from right edge of target in the center, passing entirely through bale and 4 feet of clay, entering the bank at a distance of 12 feet back of target, and imbedding itself.

4th Shot struck 2d bale from left edge in the center, passing entirely through bale and 4 feet of clay, entering the bank at a distance of 11 feet back of target, imbedding itself.

The 5th bale was not fired at, at the request of the inventor. It will be perceived that all the bales were pierced, and the projectiles not having been found, it was not possible to ascertain which offered the greatest resistance.

Respectfully submitted,

W. MITCHELL,

Lieut.-Comdr. U. S. N. and Executive Officer.

The Atlantic and Great Western Railway.

This is a line of the broad gage, which taps the New York and Erie at Salamanca, and is intended to run to Alton, Illinois; forming a continuous broad-gage line from the Hudson to the Mississippi River. On the unfinished portion of the main line west of Akron, Ohio, upwards of five thousand laborers are constantly at work, and of the 30,000 tons of rails required for its completion more than 20,000 tons have already arrived. Between Salamanca and Akron, and along the tributary branches from the oil regions at Titusville and Franklin, the line is in fine working order. Upwards of one hundred additional engines are in course of construction at the best engineering establishments in the country, with a corresponding number of cars, to be ready for the through traffic which will follow its connection with the Ohio and Mississippi Railroad in November next. The central depot is at Meadville, in Pennsylvania, where the company's workshops and the houses of the employees are situated, covering an area of sixty acres.

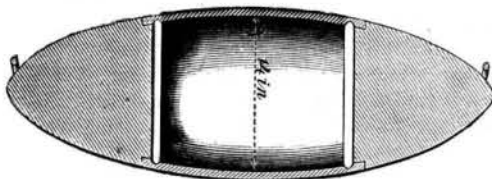
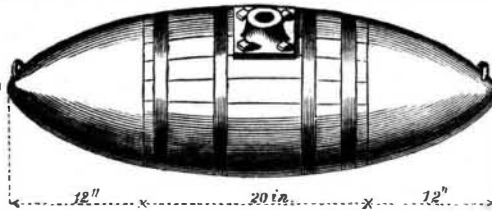
The Boston people intend to construct a line to connect with the New York and Erie, at Newburg, N. Y., and thus form a continuous line from Boston to the Mississippi. The Boston line is to run to Fishkill, opposite Newburgh.

EXAMINATION OF TORPEDO SENT FROM THE NAVY DEPARTMENT.

NAVY ORDNANCE YARD, Washington City, Sept. 5, 1863.

Lieutenant Commander Wm. Mitchell, Executive Officer:

SIR:—I have the honor to report that I have examined the Torpedo sent to this Yard from the Navy Department, of which the following is a description:



It is three feet eight inches (3 feet 8 inches) in length, by one foot two inches (1 foot 2 inches) in width, elliptical in shape, and resembles very closely in its general appearance an ordinary Nun Buoy. It seems to have been constructed of a small keg, the staves of which are oak with two solid cones of pine driven on to the heads and secured by hoops, the heads being well pitched. On its sides secured by screw bolts, are two metal tubes which probably contained the fuse and apparatus for igniting it, but these had been removed before its arrival here. The cavity is of sufficient capacity to hold about sixty-five pounds of powder. Annexed is a sketch of the Torpedo.

Very respectfully,

Your obedient servant,

M. P. JONES,

Lieutenant Commander U. S. N.

Respectfully forwarded.

W. MITCHELL,

Executive Officer Ordnance Yard.

BIRNEY'S INCENDIARY SHELL.

EXTRACT FROM REPORT TO BUREAU OF NAVY ORDNANCE IN REFERENCE TO BIRNEY'S INCENDIARY SHELLS, DATED

FLAG-STEAMER PHILADELPHIA, Off Morris Island, Sept. 19, 1863.

"Yesterday, in a conversation with Major-General Gillmore, he stated that the incendiary shells used by him burst, without exception, before reaching the distance of one mile; and that, in trying the composition on his tent floor, the burning of it was quite harmless."

ENGLISH AND AMERICAN IRON-CLAD SHIPS OF WAR.

If our people are in any doubt as to the utility of the monitor batteries and their value as impregnable vessels of war, our ostensible friend, the English Government, seems to be fully aware of their value; they are quite astonished at the qualities recently developed by the craft in question. The united leading press of England concur in attributing great impregnability and offensive power to these ships, and express some doubts (in view of the destruction of the rebel pirate *Atlanta*, in Warsaw Sound by the monitor *Weehawken*) whether their own vessels, built on similar principles, are fit to be pitted against ours. The English *Royal Sovereign* is a turret ship; differing materially from our vessels of that class, as will be seen by referring to the subjoined description cut from the London

Times, and comparing the same with the essential features (now so well known), of the Ericsson batteries.

"To return to our own *Royal Sovereign*. It is necessary to repeat here that she is being fitted with four turrets, the one forward being the largest of the four, and intended to carry two three-hundred-pounder smooth-bore guns, while the three others will be of less diameter, and will carry only one gun each of the same calibre. From the inner skin of the turret, formed of half-inch boiler plate, will project outward iron ribs T-shaped, ten inches in length and twenty inches apart, the spaces between these ribs being filled in solid with teak. Round the outer circumference of this combination of teak and iron ribs is a crossed trelliswork of three-quarters of an inch of iron, and on this trellis work, and through all and outside all is bolted eight inches of solid teak. Here is a structure at once far better calculated to resist the impact of shot than the turrets of the *Keokuk* could have been, although the turret of the *Royal Sovereign* which has been so far described is as yet without its armor; for round the outer surface of the turret on the eight-inch teak cushioning, are to be laid the solid five and a half inch rolled armor plates, which are now being manufactured, and bent immediately on leaving the rolls to the required segments of a circle, at the Parkgate Works, Yorkshire. In the immediate front of the turret or vicinity of the two ports, however, the resisting power of the five and a half inch armor plate is further supplemented by a four and a half inch rolled plate: so that in the section of the turret's entire circumference which will be exposed to the shot of an enemy, the defensive powers of the turret will consist of, from outwards, ten and a half inches of iron, three and a half inches of teak, five inches of three-quarter inch iron trellis work, ten-inch iron T-shaped ribs filled in with teak, and the inner iron skin. The outer circle of armor plates is to be bolted, or 'married,' as we believe it is technically expressed, round the turret's upper rim, to a massive iron ring nineteen feet in diameter, of fourteen-inch by two-inch iron, and weighing two tons nine hundred weight. This part of the turret's defense will extend to just beneath the upper deck, but is strengthened and protected by a massive iron rim, wrought in sections and riveted together in the strongest possible manner; the armor-covered portion of the turret projecting above the upper deck, and with the rim, being together in shape exactly like a broad-trimmed coachman's hat of the olden times. The turret itself of course rests with the guns and their carriages upon a massive circular platform or turntable, the outer rim of which is fitted with a ring road of stout iron teeth, by applying to which a cogged wheel, worked by a winch by eight or less men at the handles, as may be required, the turret is made to revolve upon the machinery below. During the recent visit of the Admiralty to Portsmouth, the foremost turret, complete in all respects except its armor plating, which, however, was represented in its weight by its equivalent in pigs of iron ballast, revolved in a complete circle in four minutes and forty seconds with eight men at the winch handles; and in the presence of Mr. Reed, Chief Constructor of the Navy, a quarter circle was turned and back again the same distance in one minute. Subsequently, however, with eight men at the winch handles it has turned a quarter circle in twenty-three seconds, or a complete circle in one minute and thirty-two seconds, thus enabling the two guns in the turret to be brought to bear from one broadside to the other in forty-six seconds.

"The *Royal Sovereign's* turret 'machinery,' with the bed upon which it rests, we will now endeavor to describe, premising that the diameter of the turret is less than that of the turntable or the machinery upon which the turntable revolves. Level with the ship's lower deck, or, as it must now be, her main and lower deck both, upon upright timbers from the ship's keelson, are laid logs of teak about twenty inches square, and extending over a space of nearly eighty feet in circumference. On these square timbers has been constructed the bed proper which supports the turret, turntable, and machinery. It is in appearance a gigantic cart-wheel, twenty-six feet in diameter; the nave and periphery being constructed of English and American oak, the periphery entirely

of banded strips of American, and the spokes of English oak. The periphery of the wheel measures twenty-four inches by twelve inches, and the spokes each eighteen inches by twelve inches, all fitted with the nicest accuracy, and bolted down immovably to the square logs of timber resting on the rights up underneath. The axle to this monster wheel exists in the iron cylinder, which will give entrance to the magazine below from the turn table, and which, twenty-six inches in diameter, seven feet six inches in length, and three tuns each in weight, are fixed upright through the center of the wheels nave; two cast-iron collars, each six feet in outer diameter, and each some hundred weight, being fixed, one on the upper and the other on the under side of the deck, and securing the axle or cylinder thus in its position immovably as a rock. The upper part of this cylinder, therefore, projects upwards of two feet from the wheels nave, and becomes the pivot upon and round which the turntable and turret revolve. From a brass collar which encircles this cylinder, next the nave of the wheel, radiate outward twenty-four iron rods, on the outer ends of which are fixed twenty-four beveled iron wheels, eighteen inches in diameter and nineteen inches broad, and which set in a double circular iron framing, work round a metal roadway, laid on the periphery of the wheel, a second brass collar round the cylinder being fitted with a set of small brass beveled wheels, the turntable thus fitting over and round the cylinder or axis, and resting with its inner circumference on the small brass rollers which encircle the cylinder, and its outer circumference upon the twenty-four beveled wheels, which work upon the iron railway laid upon the periphery of the wheel. Every part connected with the iron work of the turret, and which is being executed under the superintendence of Mr. A. Murray, Chief Engineer to the Admiralty at Portsmouth, is very massive in its character, and is beautifully finished, and so far as any judgment may be formed at present, there is nothing to suggest the slightest fear of the *Royal Sovereign's* turrets revolving freely under the heaviest storm of shot that can be brought to bear upon them, or under circumstances of the greatest possible inclination which may be given to the ship's deck in the roll and tumble of a channel sea. Revolving on an immovable central axis as does a steamship's paddle wheel, it certainly appears that even fifteen or twenty degrees of inclination should not interfere with the turret's working. The side armor of the ship, five and a half inch plates, from the Atlas Works, Sheffield, are supported behind by three feet of solid timber, which is strengthened and supported in its turn by alternate wood and rolled iron beams, placed at one half the usual distance apart, to each of which iron knees of great weight are attached, and by the crossed diagonal iron banding over the inner skin of the ship. The alternate wood and iron beams are covered with one-inch iron plates, all of which at their butts and edges are riveted together with four-inch straps of one-inch iron. Stringer plates also run fore and aft this iron deck. Over all this iron is now being fixed the upper deck proper of the ship, which consists of six-inch oak plank, and over a certain circumference of this oak planking, in the immediate vicinity of each turret, will be fixed the ring of tapered armor-plating, which will form the glacis of each turret at its base. The ship, owing to the fact of her having been converted from a Symondite three-decker, will necessarily draw too much water to maneuver close in with the shore in shallow waters; but she will doubtless be, when completed (if armed with guns equivalent in their power to the American monitors), the most formidable ship of war in the English navy, whether for purposes of offense or defense. Such is the *Royal Sovereign*, the first of England's turret ships: a vessel that, if armed with weapons of offense equal to her defensive powers, may stand a favorable comparison with the best of the American monitors. When completed and ready for service, however, it might be a wise act to take her outside the Wight, and give each of her turrets a concentrated broadside of 68-pounders from a steam frigate going past at full speed. Such an experiment, startling as it may seem at first sight, would most probably save the country some millions sterling during the next few years, whether the *Royal Sovereign* proves to be a successful or unsuccessful experiment as our first tur-

ret ship. We, however, believe she will prove the former."

We simply present this—the most accurate account, we suppose, of the representative iron-clad of England—without indulging in any comment whatever upon the mechanical value of the several arrangements mentioned. The *Duclator*—the largest iron-clad we have as yet—will soon be launched and tried. This (to be) famous ship is on the general principle of the monitors, though greatly modified in detail, and it is confidently predicted by her builders that she will be an excellent sea boat. The turrets are much larger in diameter than those on the smaller batteries; they are 15 inches thick, and we believe 28 feet in diameter; the overhang of the side armor shelves is reduced to almost a nullity; and the side armor itself is 10½ inches thick, backed with five feet of heavy oak timber. The deck plating we do not know the thickness of, but understand it to be two inches laid on massive wooden and iron beams. The models of the vessels (there are two on the same plan), have as fine lines as a river boat, and with their strong engines, 100 inches cylinder and 4 feet stroke, they should achieve a rate of speed commensurate with their other qualities; certainly far above the ordinary rates of vessels-of-war. They will be ocean steamers, capable of making long voyages, and obtaining a high rate of speed. To these ships may be safely intrusted the task of cruising in search of such unfriendly iron-clads as dare to provoke their wrath, and to the monitors the defense of the coast cities, aided by the permanent fortifications.

It is a most significant fact, however, in the *Times* account given above, that the reporter says (having evidently conversed with persons qualified to criticize the *Royal Sovereign*) that "if the vessel be armed with guns equal to her offensive powers, she may stand a favorable comparison with the best of the American monitors," &c.

It is in no sneering or carping mood that we make these remarks; the engineering skill and constructive talent of the English nation has a world-wide celebrity; but they are slow to learn, and are hard to teach, when prepared to abandon their national prejudices. It is not to be supposed that they would take one of our monitors and forthwith construct a fleet of war vessels upon that plan; but it does seem strange that, with repeated and often dearly-bought experience, they should persist in constructing vessels on principles that, to say the least, have never done any great service, or proved at all useful. The *Dunderberg*, now building in this city, is the only broadside ship, except the *Ironsides*, yet projected or even under way for the Government; and yet she has more massive sides and is a heavier vessel in every way than the *Royal Sovereign*; provided the article copied is authentic. It is true that the casemated portion is not so thick or heavily armed with iron (being only 4½ inches) as the *Royal Sovereign's* broadside; but the *Dunderberg's* turrets are stronger and thicker, iron for iron, than the British ship's, and the vessel will be most heavily armed. It remains to be seen of what utility the teak wood on the *Royal Sovereign* backing will be; and the proposition to give the turrets a broadside from 68-pounders (?) would be of service in convincing the British Admiralty of the invulnerability of their pet ship against such pellets.

If, however, they desire to see how soon the turrets can be demolished, they should import a Parrott 300-pounder, and let fly a couple of broadsides from those guns at their structure; they will, perhaps, receive some new ideas upon the subject of impenetrability. Referring to the "Parrotts," the *London Army and Navy Gazette* says:—"Before such projectiles as these guns carry, the breaching of masonry, whether of brick or stone, is but a question of short time." "Had such guns been available in the trenches before Sebastopol, the Allies would have made short work, not only of the Redan and Malakoff, and *bastion du mal*, but of the shipping and of the forts on the other side of the harbor." "It is undeniable that the establishment of a few of Major-General Gillmore's batteries before Sebastopol, on the 17th of October, 1854, instead of the 'tremendous armament' of which Lord Granville boasted, would have 'knocked the place into a cocked hat' in twenty-four hours."

"Unquestionably the Admiralty would be rather

nervous about the result of firing a 450-pound shot against the side of the *Warrior*, at the distance of 200 yards, notwithstanding the experiments," &c. The question then arises, Have the English any such guns? "In face of these facts, we are obliged to record that our scientific officers are of opinion that the best English gun for breaching purposes is the old 68-pounder!" It is a lamentable confession, but it seems to have an excellent effect upon the soul; for the *Army and Navy Gazette* deduces the following remarkable bit of philosophy from the startling facts which have been revealed to it: "Do not let us pooh-poo the Americans. If we are wise, it is the last thing we ought to do."

When our own iron-clads are afloat, we may safely repose confidence in them. The monitors are impregnable so far; and if rightly handled, will do all that is claimed for them. That the ocean ships will also achieve fame, and be an additional safeguard to this sorely-pressed Republic, is a matter of not the slightest question.

The Capacity of our Artillery.

A recent editorial in the *Tribune*, commenting upon the artillery in use before Charleston, is thus replied to, apparently from an official source:—

"Has any one devised a more effective gun than Parrott's 8 and 10-inch rifles, for range and boring power, and a more formidable smashing piece than the 15 inch navy gun, cast hollow, on Rodman's method? The trial 15 inch navy gun has been fired, at the Ordnance Yard, Washington, more than 700 rounds; 60 of which have been with 60-pound charges of cannon powder, whose initial velocity has been full 1,500 feet—the lesser weight of charges decreasing proportionately to 35 pounds; and yet, under these severe tests, the gun shows no sign of weakness or decay. And this, too, in the last 200 fires, with the gun reduced on a taper along the chase to 3 inches of its original thickness at the wall of the muzzle. The 13-inch gun spoken of has been laid aside by the Navy Ordnance, and only two of that class are now in course of construction (of wrought-iron) by Mr. Ericsson. These guns are yet to be proved. Meanwhile the navy 15-inch gun has been so far modified as to admit of its use in the monitor turret ports, designed for the 13-inch guns, in view of removing the necessity of a smoke box, by running the chase of the piece through the port-hole, and thus gaining the advantage of two inches greater diameter of shot with less opening of port for the original 15-inch. The calibre of the navy 15-inch was suggested by Mr. Fox (the plan was Dahlgren's); the mode of fabricating, Rodman's."

If this is true, why in the name of common sense don't the authorities practice on Moultrie with 40 or 50-pound charges.

Closing of the American Institute Fair.

The Fair of the American Institute closed on the 25th ultimo. In previous numbers of the *SCIENTIFIC AMERICAN* we have given a brief synopsis of the salient features and inventions on view. We understand that the Fair has not been a pecuniary success; the building being required for other purposes soon after the Exhibition was well under way. We very much missed the usual feature of former fairs—machinery in operation—and heard many remark that this was the one thing wanting to make the scene spirited and enlivening. We append a brief account of the number of medals awarded in the several departments. We are not able to specify the several successful parties, as it would occupy more space than is at our disposal.

Of gold medals, there were awarded in all five; of silver, including cups, there were awarded in all sixty-six. A quantity of bronze medals and diplomas were also awarded to various persons.

POSTAGE STAMPS.—"The invention of postage stamps," says the *Monde* (Paris) "is far from being so modern as is generally supposed. A postal regulation in France of the year 1653, which has recently come to light, gives notice of the use, for Paris, of post paid tickets, instead of money payments. These tickets were to be dated and attached to the letter, or wrapped round it, in such a manner that the postman could remove and retain them on delivering the missive. These franks were to be sold by the porters of the convents, prisons, &c., at the price of one sou.