U.S. Ship John Adams

October 1849

Commodore

In addition to the tabulated report of inspection of the guns of the squadron made in obedience to your order by the board of which the undersigned was one – and herewith submitted. In conformity with your expressed wish, I annex such other information as my service in the ordnance and the reports of my associates in that duty will have put one in possession.

As we have the best knowledge of the new guns which are designed to supersede, and will shortly supersede the old cannon entirely, I shall confine my remarks to the new models for the most part.

There are three classes of the new guns mounted in the three ships of the "Brazil Squadron'" to wit

32 pounders of 32 cwt class

32 dittto " 51 cwt class

8 inch shell guns of 53 cwt class

To begin with the first, or 32 cwt 32 pounders –
This gun was manufactured for the first time in 1846 and
the model was tested by breaking one of the first cast,
No. 8. In June 1946. The extreme proof was executed
by the undersigned on the sands(?) at Old Point Comfort.

Two guns, Nos 2 and 3 were first proved at the foundry with
10 lbs of powder & round shot and 1 wad – fired twice.
Subsequently they were mounted, and fired by me, 50 rounds
each with the service charge (4 ½ lbs) of shot or shell,
and No 3 then put to extreme proof. It bore a succession
of heavy charges – destructing with 20 lbs of powder 3 shot
and three wads at the 19th firing, if my recollection be accurate.

(?) for the strength of this gun, which I
consider beyond the reach of injury from any accidents
of service to which it may be exposed.

This gun was intended to replace the 24 pounder "sloop gun" – It has the same length precisely, and was designed to have the same weight. The foundry made it 200 lbs. heavier.

One of the first questions made was, whether this gun should be chambered – and trial was instituted to settle it by comparative ranges. No 2 in the firing above selected(?) was chambered. No 3 on the other hand was an unchambered gun. The result as expected, was equality in all respects. In the mean time the experimental battery was in view, and the question left open for future proof.

This proof in due time was had, and I now make extract from the report of practice conducted by Lieutenant (I.T. Dahlgren?) of the U.S. Navy.

Extract Nov 1, 1848

"Herewith I submit the record of the progress made in the practice for range to this date, chiefly with a view of giving the comparative ranges and recoils of the 32 pounders of 32 cwt when chambered and unchambered."

“It would seem that, in range, the uncham
bered piece excels the chambered in every case. By no considerable quantity it is true, and differing so little from the variations of the individual results as to admit of no final deduction from a single comparison. But being uniformly conducted in every case, does justify the conclusion that the chambered gun is slightly inferior to the unchambered in range, the relation being 113 to 117.”

“The recoil is very considerable in both guns, but greater in the unchambered, the ratio being 4 to 5. With the chambered gun is to be had diminished recoil. With the unchambered, a straight bore, that required no

complication of rammers and sponges, and which in the heavier ships, removes the necessity of cylinders of different diameters.

"The unchambered gun is in all probability strong enough for any service that it can be put to. The practice shows that the carriage, breeching of balls are fully capable of withstanding more than two or three hundred fires."

"The variations in the range are moderate when the atmosphere is undisturbed, but whenever the wind prevailed from any quarter, the variation increased very much."

The cylinders were of the usual regulation material, twilled flannel, and at every fire, remnants were taken from the gun, commonly one to two square inches of the bottom, and always including part of the bottom seam.

The sponge had the effect of crushing and removing these remnants – but not invariably, as the scraper at times brought away very small pieces after the sponge."

This proves that too much care can not be given to this detail of service, as the consequences of an accident are the loss of life or limb, and there follows a demoralizing effect on the men at the guns.

To complete the detail of this gun, there are required

the higher degree of elevation, the extreme distance at which the shot or shells penetrate sufficiently to be available, and the adjustment of the sights to the several ranges."

This last has since been effected and they have been placed on the guns of the Falmouth and this ship.

Guns

The pieces used (in the practice) were of the 32 cwt class. One of them has an 18 pounder chamber. It is marked No 41, and is from the West Point foundry.

The details according to the draft are:

Diameter of the Bore	6.40 inches
Do of chamber	5.29
Length of chamber	7.—
Do of slope (or junction)	2.50
Do of bore (chamber inc)	5.10
Diameter of visit	0.20
Distance of do from bottom of chamber	1.54
Inclination of vent	8 (degrees) from vertical

The external orifice of vent after 405 rounds was enlarged to).25 inches and the surface of the metal immediately around it was indented 0.05 in. by the action of the hammers.

In breeching, a drill of 0.5 in was first passed through, and impressions of the vent taken at every inch.

Until an inch of the bore the wear of the vent gradually increased to 0.30 in – irregular in figure & grooved. At this point it increased suddenly, swelling towards the bore, so that a circle of 0.75 in would hardly include the grooving of the internal orifice.

The length of the bore in this gun was 74. 95/100 inches. The weight 3734 lbs and the preponderance 312 lbs The greatest wear in the bore was between the 63rd and 45th inches from the face of the muzzle, and just about the vertical axis of the projectile when in its place.

The greatest wear of the bore after firing 405 shot, was 0.018 of an inch

The

"The unchambered gun –

Resembles the chambered in

general, except that it has no chamber. It comes from the Richmond foundry, weight 3783 lbs and is marked No. 4."

After firing 400 shot the vent and bore showed similar degradation to those of the chambered gun.

The Carriage

"The carriage(*) used is that intended to be used ordinarily on shipboard for the 32 pdr. of 42 cwt.

Length of the cheeks 57 inches

Weight 10040 lbs.

"It had never been put to service previous to that herein recorded. The unchambered and chambered guns were both fired on it. But September 20th the carriage intended for these guns being completed, this one was transferred from the battery. It had now withstood 700 shotted rounds without the (?) of any part, either wood or iron, though its appearance evinced service. Of these the recoil of 200 had been checked by a breeching, and was free in the remaining 500.

After 60 rounds on the new carriage its (?) were bent up considerably. One so much that the iron was opened at the joint. These were3/8in thick, after the new pattern. Those on the other carriage were 9/16 in thick."

The (?) of the new pattern carriage have been hard upon the trunnions, hence the fracture. Instructions were given that in all carriages made thereafter, the (?) should be clear of the trunnions 1/10th of an inch.

"The breeching was of the usual kind, and 7.75 in in diameter. It had been condemned from some (*) like those on (?)deck of Brandywine.

cause unknown, but nevertheless was able to control the powerful action of this light gun for 200 rounds, and was then laid aside because the edge of the carriage, not being round enough, had worked through about ½ a strand.

Cylinders

"The cylinders are of the regulation flannel. The diameters correspond to those recommended by Captain Mordicai (experiment on gunpowder) as best adapted to permit the maximum effect to the charge – viz 4.6 in for the 18 pounder chamber, and 5.5 in for the 32 pounder.

The body of the cylinder is made straight with a single seam and the bottom sewed to it. Owing to the strength of the material and the manner of making it , these cylinders retain their shape and never assume that of a mere bag, as those made of the common flannel are apt to do.

It is observed that, with the 4 ½ charge, remnants of The cylinder equal to 1 or 2 square inches are left behind Invarably. The sponge ordinarily crushes and removes this but sometimes the small scraper would bring yet more, and appeared a sure and convenient relance in this important

particular,”

Shot and Shells

The regulation (?) is now maximum 0.18 in, minimum is 0.12 in, mean is 0.15in. In the experiments to establish the ranges, the limits of the (?) were fixed at 4.24 and 4.26, so that all the projectiles differed in diameter Less than .02 of an inch. The shotand shells were also weighed In murcury to obtain the preponderating point, which was the guide in placing the projectile in the gun in order to ensure uniform results. Projectiles of equal absolute weight were paired to fire from each of the guns for the same purpose. The shells were subject to the

same scrutiny. They were strapped and fitted in all respects as for service, except the full charge of powder, which it was not safe to une within the limits of the (?). But in order to render the circumstances of this practice as nearly similar to those of service as might be, the shells weere charged with 2 oz of powder to to blow the fuze and the remainder with rice, which in weight differs little from powder.

A shell (32 pdr) with its fuze screwed in, weighed thus, filled With powder 26.44 lbs, with rice 26.34 lbs.

Loading

When the gun had been fired, a point coinciding (vertically ?) with the hind part of the (?), was made on the platform and the recoil measured.

The gun was run out and a moist sponge entered and followed by two others dry. Then a scraper to remove any remnants of the cylinder. Very often the scraper was used first, to ascertain the quantity of the remnant, as the sponge generally crushed it.

The cylinder was sent home, neck and seam clear

of the vent by gently pushing it. Then the shot to its place. The shot were (?) (like the shells) in order to preserve the heavier part in one position and thereby avoid the discrepancies arising from changes in the particulars.

The shells were always adjusted with the fuze uppermost and in the vertical plane.

With precision firmness the cartridge was never (?).

8

Primer

This consists of a quill (?) to the vent, fillled with fine grained powder. It is surmounted by a cap of thin paste board,in which is fulminate of mercury, combined with a small portion of (?) gunpowder.

Finding that the seam of the paste board cap broke the force of the blow, I substituted common brown cardridge paper for it and reduced the charge of fulminate one half.

The cap of pasteboard was generally coated with shellac coloured black (the (?) recent primers). The paper head with the shellac uncoulored and the barrel of the quill also. By which the p[rimer was so well preserved

as to remain in water several days and yet explode. This the old primer would not do.

The cylinder is never pierced when primer are used.

With these preliminary remarks I proceed to the ranges of the 32 cwt. 32 pounder gun, and for the sake of the interesting comparison give the summary of the chambered and unchambered guns, all other things being equal in the experiments.

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[Pages 9-12 are tables comparing the 32 cwt chambered and unchambered guns]

13

Notes on the 8 inch shell gun,

Class 53 or 6000lbs

As in the case of the 32 cwt, 32 pounder, I gave as the most accurate information extracts from the report of practice with the 8 inch, as far as it is in point.

"The practice with the light 8 inch gun has now sufficiently advanced to afford data for applying to its class, tangent sights, I therefore lay before you the results obtained to this time.

I beg leave to premise that neither the report, nor that on the 32 of 32 cwt can be considered as intended to embrace all of the facts that go to constitute a complete record of these guns.

On the contrary, the present practice has been directed to a specific purpose, that of sighting the new guns about to be placed in our ships.

And the accomplishment of this being desirable as a primary object,

many details have been necessarily postponed, which however useful or interesting, could not be considered as indispensable to to the question proposed. They will however be examined at the earliest occasion.

"It may not be (inadvisable ?) to ask attention to the more important facts developed by a comparison of the qualities of the 8 inch gun and the 32 of 32. They seem to point to the substitution of the 8 inch for the latter where they can be carried conveniently.

Generally speaking, increase in caliber has

led to some sacrifice of range, but such so do not be the case at present, for the range of the shell from the 8 inch guns of 6000, with a 7lb charge, cannot be considered as inferior to that of shot or concentric shell from the 32 of 32, the excentric 32 shell being out of the question on account of its great irregularity (of range). There can be but little doubt also that the efficiency of the 8 inch shell on impact is superior to that of shot or shell from the 32 of 32 cwt.

To the superior effect of the 8 inch shell just mentioned may be added the greater convenience which results from the diminished strain on the breeching, the bolts and frame, as wall as allowing greater space between the guns.

The shell may not be quite so steady perhaps as the (32 pdr) shot, but the difference is not so great as to give any weight to objection on this account.

The ranges of the 8 inch above referred to are those produced by the charge of 7lbs. Comparing them with those of 8lbs. it will be seen that the distance gained in range by no means compensates for the additional recoil. The 8lb charge might therefore be advantageously replaced and the 7lb used with one reduce, which if it be desirable to have in a ship as few classes of cylinders as possible, might be one of the charges of the guns on the main battery. Those in a sloop of war and (spac?) deck of frigates it might be the charge of the 32 of 32, viz 4 ½ lbs, and on the main deck of small frigates, the second charge of the 32 of 46 cwt.

With regard to the cylinder of chambered guns, the lower charges should always be reduced in diameter,

never in length. The latter entails the necessity of filling the space between the charge and projectile, or if there be (shot?), of reducing its size so as to enter the chamber, and it therefore has comparative windage with the high charge.

On the other hand, as the primers are proved on 8oz of powder in an 8 inch gun, there can be no reasonable doubt of their capability to pass the space left (above) by a cylinder reduced in diameter, and to fire the charge.

Until very recently it had not been in my power, at low elevations, to observe the extreme grazes in ricochet, nor the time.

The gun used was of the class known in the Regulations of 1845 as the 8 inch of 6000.

The details of the office draft are:

Diameter of Bore	8 inches
" of Chamber	6.4
Length	7.0
" of slope or function	4.0
" total of bore including chamber	95.0
Diam. Of vent	0.2
Distance of " from bottom Of chamber	1.8
Inclination of vent	11(degrees)

The present piece was cast at the Pittsburg Foundry, weighs 6260 lbs, is number 34, and was inspected by Commander Magruder in 1846.

Its actual measurements necessarily do not differ from those prescribed, more that the regulations permit.

Two of these guns were carried to extreme proof at Pittsburg by Commander M' Hussic and showed the model to be of extraordinary strength. The [two words unreadable] at about

the 30th fire, if my memory serves me, the charge about three or four times the quantity of the service charge.

The vent has been affected by the firing in no great degree except immediately at the main oriface; here it has been worn so that a circle of 0.5 in. in diameter would be required the include the governings. These however do not extend far into the vent for at one quarter of an inch from the bore. The greatest diameter is 0.28, being an increase of 0.08 on the original size.

The outer surface guaged 0.23 in after the practice.

The

The greater wear in the bore was about the vertical axis of the shells which with the charge is 83.2 in from the face of the muzzle: amounting to to ".04 in.

The original proof of this gun was with 14 lbs of powder – 1 solid shot and two wads – fired twice.

The carriage is that inteded to be used on board with this gun.

Weight 1200 lbs

No part of the carriage has been in any manner affected by the firing.

The breeching was of the usual kind and 9 in. in diameter. The extent of its service will be seen the tables of range.

Charges

The charges for the light 8 inch, directed by the Regulations Of 1845 are 8lbs, 7lbs, 6lbs in the proportion of 1/10, 6/10 & 3/10 respectively.

The cylinders were of the same material and made in the same manner as mentioned in the previous

report. The length of the 8th charge was 8 inches, its diameter corresponding to that of the chamber, so that it occupied the chamber and projected a little into the slope.

The 7th charge had a llength and diameter of the chamber.

Trial was made of the reduce of 41/2 lbs which is the full charge of the 32 of 32, the gun usually placed in battery with the 8 inch of 6000.

Remnants of cylinders were still obtainable after each Firing, but not as large as those left in the 32 of 32.

The

"The cylinder is never (?) when percussion primers are used, but always when the tubes of match are employed to discharge the piece."

Projectiles

"Shot were not fired from this gun, being prohibited by the Orders of 1845.

The regulation shells are excentric. Those used in this practice conform to the Bureau draft (?) Nov. of 1847 and have the greatest amount of excentric mass. They are cast with iron bouches, but the fuzes are used with the regulation bronze stock, instead of being placed in the metal of the shell according to W. Alger's plan.

The shells were carefully guaged and their maximum and minimum diameters were 7.84 – 7.86 in. leaving only a possible variation of 0.07 in. from the established mean windage of 7.89in.

They were then weighed, those of like weights classed in sets of ten, and the number used for each degree of elevation in the full practice.

The shells were fitted and strapped in all respects

As for service, excepting that they were charged with 8 oz Of powder and 22 oz of rice, making the weight of the shell To be nearly the same as if charged with powder."

The flat head primers of recent model were used.

Summary

(There follows a table of Ranges of Excentric Shells from the 8in Gun)

(Summary charts of ranges and recoils of the 8inch and the 32 pounder compared)

I am, Commodore,

Com. Geo. W Storer Your obedt servant

Com'g USN Forces, Coast of Brazil, etc.

L M Powell

Commander

Com George W. Storer

Comg U.S. Naval Forces

Coast of Brazil