

OUR LOST PET.

She went what time the birds of passage sought,
The sunny south, our first and only love;
A short and pleasant loan, who only brought
Joy to our hearts awhile, then soared above.

A star dropped where nought star-like long may
be—

Fair as a day-old flow'et washed in dew,
With eyes so clear, we fancied we could see
Her soul—the Angel in her—shining through.

Departed hath she, like the first light snow;
Quick melted in the early winter sun;
And all of her we evermore may know
Is, that a marvellous sight hath come and gone,

For now, left lonely as we are a rain,
Out only darling, gone beyond recall,
Is unto us a vision in the brain,
A dream within the heart, and that is all.

—Chambers' Journal.

ARMAMENT OF SHIPS OF WAR.

We give below the conclusion of Captain Jeffers important paper:

The next point to be determined is—Should the guns be mounted in pivot or broadside? The same reasons which cause the 9 inch to be superior to the 8 inch may also be urged in favour of the 11 inch. The higher the calibre the greater the range, accuracy and power. The 11 inch shell has the content, and nearly the weight of, 2 of 9 inch; and, since the pivot gun can be fought on either side, and usually the 9 in. cannot be shifted over, it is practically equal to 4 of 9 inch, whilst its weight with carriage is little more than that of 2 of 9 inch.

The concentration of effect due to the explosive capacity of the 11 inch shell is even more important than that due to penetration and size of orifice. The misfortune of the larger calibre is that its substantial benefits are seldom visible before those who continually experience the disadvantages of its greater weight and size. The bulk of the gun, the toil in handling it and its projectiles, are ever enforced to the eye of the officer and to the exertions of the men. But the great power it confers is not exhibited by the ordinary practice, and remains a myth until the hour of battle discloses the fact and permits the heavy calibre to tell its own tale more eloquently than the most convincing arguments.

It has, however, been abundantly proved that the 9 inch gun is perfectly manageable on a broadside carriage in any vessel having sufficient room to work them; still, the writer is in favour of mounting them on a pivoted broadside carriage in all vessels, having reference here to the greater facility of training and consequently greater accuracy of fire, and the preservation of the decks, the fibres of which are crushed by the great weight resting on the front trucks.

The basis of armament is either—Given a ship of a certain tonnage, draft of water and speed, with so many tons of displacement assigned to ordnance, how dispose of that weight to best advantage? Or, as in the *Kansas* class—Given a designated battery, what is the smallest ship which, on a given draft of water, will carry that battery? In every case the bureau assigns the smallest number of the heaviest guns to form the weight, and prefers pivots to broadside when the deck arrangements will permit. For it is thoroughly established that a small number of large pieces will inflict injuries beyond the power of a large number of small pieces.

In order that she may exercise her full measure of offence, speed has become the indispensable attribute of every ship of war; without it her powers are altogether

incomplete. It is very right that when a vessel of war encounters a superior force, speed should be able to make her safe, but the necessary diminution of offensive power should not be so great as to disable a first class steamer from matching any vessel of her own class of inferior speed, but provided with a proper armament, otherwise her usual business would be running—*fighting* the exception!

It will often happen that in order to protect important interests, the battle must be fought at all hazards, and that avoiding the action will not serve the purpose. What then will be the chances of these costly fabrics? It is, moreover, certain, that we have a right to demand that our vessels of war shall have equal speed with those of other nations.

It is by this equality only that our vessels shall select and retain the distances they prefer, and less speed than this should not be admitted in any discussion of the subject. This does not mean that every United States ship shall equal in speed the best ships of other nations, but that the average speed of our Navy, taken collectively, shall be equal to that of others, also taken collectively. If, however, our ship is inferior in speed, then the choice of distance is with the enemy, who is supposed to prefer close quarters; but if our ship is properly armed, he can only reach this position after passing through the deliberate fire of powerful guns.

In 1862, Assistant Secretary Fox proposed, Admiral Dahlgren designed the armament, and Constructor Leathall the hull of a vessel of the same length as the *Lancaster*, but with more beam, to carry 12 11 inch guns in broadside pivots, on spar deck. This antedates, by some years, the English *Inconstant* and *Shah*, with a similar arrangement of armament. The great majority of cruising ships must continue to be wooden or (its equivalent) composite vessels; but with the introduction of iron-clads of various degrees of resistance, these wooden ships should be capable of effective offensive action against most cruising iron-clads.

And although the preceding reasoning is based on our present armaments and wooden ships, it is equally applicable to an iron clad fleet, and there is no reason why our ships, heretofore superior to all others in armament, cannot be restored to an equality, for the time has now come when we must prepare for an entire change in the armament of our ships, although the principle for determining it remains undisturbed.

I am also of the opinion that this change must be the introduction of the rifled cannon as the entire armament of our ships, otherwise we shall find ourselves, in a war with any leading power, overmatched not only in numbers but in power of individual ships. This we cannot afford; our ships, if few, should be the best of their kind, and hitherto, so far as armament was concerned, were superior to all foreign ships.

A clever English writer remarks of our ships in 1812. "By substituting long guns instead of our short ones, they secured for themselves the immense advantage of being able without loss or damage, luxuriously to pummel us to death, at ranges which they had precalculated they would be completely out of our reach." But other powers have since adopted our system of a few heavy guns, and have, after many years of experiment and millions of expenditure, established two or, perhaps three, systems of rifled ordnance as worthy of confidence.

1st. The system of breech loading, known

as Krupp's, to whom it owes its experimental development; though it is understood that this system was presented to Captain Wise, one of my predecessors, years before Krupp adopted it. The essential features, the round backed wedge, the locking screw and the gas check, are due to our countryman Broadwell. It is, however, probable that it would not have proved a success in our hands, owing to the state of the steel manufacture in our country at the time.

2nd. *The French System*.—This, which has been successfully applied to the largest calibres, is also an American invention developed in France.

3rd. *The Woolwich muzzle loading*, has met with success as a gun; but its studded projectile is far inferior to our expanding system. Recent advices show that after pool pooling our expanding system for many years, and experimenting on wads and gas checks to prevent erosion in the bore of their muzzle loading guns, our English friends are about abandoning the studded projectiles for our own plan. The principal advantage of rifle cannon consists in their greater penetration, due to the concentration of effect on a smaller and better form of surface; next, in greater explosive contents for same weight; then range, and, lastly, accuracy. The accuracy of spherical projectiles is, however, quite sufficient at usual engaging distances, and the difference due to a rifle projectile is quite lost in the difficulties of aiming, and the motion of both vessels. That the rifle to be adopted should be a breech loader is, I think, obvious, and for two principal reasons.

1st. In order to utilize a slow powder less destructive to the gun, the bore must have greater length in order to admit of a longer time for the gasses to act.

2nd. Since guns wear out by the rush of gas over the projectile in muzzle loaders, scoring the bore is largely prevented by breech loading.

To these we may add, that with the increased length of gun, the beam of very few ships will permit the muzzle of the gun to come within the port for convenient loading. That there is no risk of accident from overloading, and that incipient cracks are easily detected. Having no colonies, it is not probable that we will ever construct cruising iron-clads, nor does it appear to be necessary, since most of those now in existence, may be pierced by their own guns, or such guns as they should carry, if properly armed. Since the general introduction of armoured ships, the conditions of warfare have been altered. And the subject of penetration has become of paramount importance. With wooden ships the mere lodgment of a shell in the side before its explosion, might inflict a fatal injury; but against armoured ships complete perforation is essential. The form of the projectile, its material, cross section, weight, and velocity on impact, must be such as to insure this, or it will be practically harmless. Experiment has proven that shells containing a suitable bursting charge may be driven through plates of a thickness equal to the calibre at short ranges, and this is about the limit of useful effect. Therefore, with the present types of armoured ships carrying from 4½ to 6 inches of armor, 7 inch is the lowest calibre on which we can rely to insure perforation, taking into consideration oblique impact, even at short range. The English have, however, settled on the 8 inch, the Prussians 8½ (21 centm.) and the French 7.5 (19 centm.) as the gun for general service, weighing from 17,000 to 20,000 lbs., firing