

Marching past and field manoeuvres under Capt. Gray and subaltern officers very good, but the driving was indifferent.

Non commissioned officers and men efficient in gun drill with a good knowledge of ammunition.

Officers and non commissioned officers able to instruct their men.

The Battery marched to camp from Toronto, 38 miles, in about 14 hours, with a halt of two hours, and returned in about the same time.

I have been informed that no injury to the horses or casualty occurred, but the distance seems excessive for untrained horses with strange and perhaps ill fitting harness.

#### Napanee Garrison Battery.

Inspected at Napanee, 12th September, 1874. Captain Hooper, Lieuts. Henery and Abarn.

This battery is composed of men of good physique and well uniformed.

I inspected them in the manual exercise which was well performed; the firing exercise not so good; company drill indifferent.

The non commissioned officers and men were fairly up in gun drill, but owing to their having only one 32 pound gun on a standing carriage with a few handspikes and no equipment of drill stores or means of mounting and dismounting, no extended drills could be carried on, and there was little knowledge shown of ammunition.

Had this battery performed its annual drill in barracks at Kingston, with the advantage of drill stores and instructors, and a possibility of actual gun practice, a different and much more satisfactory result might be looked for, and I would strongly recommend that such may be arranged for next year.

The officers were able to instruct in gun drill.

#### Toronto Garrison Battery.

Inspected at Toronto, 9th October, 1874. Captain Gibson.

This battery paraded without arms so that I was unable to inspect them in manual and firing exercise.

They had not been instructed in company drill and their squad drill was very indifferent.

At standing gun drill, however, the battery appeared very efficient, and the non commissioned officers were able to instruct their men.

Owing principally to the want of actual gun practice, there appeared to be little knowledge of ammunition or stores, and for want of proper material no instruction in mounting or dismounting ordnance, or in fact, in anything but gun drill had been attempted.

As in the case of the Napanee Battery I should recommend that this battery perform its annual drill in barracks, either in Kingston or in Toronto.

#### Cobourg Garrison Battery.

Inspected at Cobourg, 20th November, 1874, Captain Dumble. Appearance of battery on parade very good, uniforms being in good order and men of good physique.

Manual exercise very good; firing exercise indifferent; no opportunity of seeing the battery at company or squad drill, weather being unfavorable.

Standing gun drill very good. The Sergeants are able to instruct; no knowledge of ammunition or stores.

Like the other Garrison Batteries, no means of learning any other drills (except mortar drill) or of performing annual practice, recommendations as to annual drill the

same as far the Napanee and Toronto Batteries.

#### CONCLUDING REMARKS.

##### Practice.

The general deficiency previously noted in knowledge of ammunition and stores can hardly be overcome by instruction during the limited time allowed for the annual training when both officers and men have other and more pressing duties to perform.

Such knowledge is only to be acquired by careful training supplemented by deliberate and systematic target practice.

This very important part of the annual training of Batteries of Artillery does not seem to have had proper attention paid to it, and I am not aware of any orders, excepting those for annual drill of 1872-73, relating to the proper number of rounds to be fired, nor of any rules regarding the time of such expenditure.

I would strongly recommend that three days at least at the conclusion of the ordinary drill be set apart for gun practice, exclusive of the time required to march to and from the practice ground.

I trust that next year this subject may receive increased attention, for it must be borne in mind that excellence in this particular, joined with capability of movement is the only true criterion of efficiency.

##### Clothing.

The clothing has generally appeared to be complete and in good order, but I would strongly urge the issue of one pair of cloth trousers with straps, or of booted overalls, to each driver and mounted non commissioned officer. The present issue of serge trousers without straps being quite unsuited to mounted duties. In many batteries I noticed drivers without either whip or spurs. The latter do not appear to be issued by Government. They are very essential and I would strongly recommend their issue.

##### Painting, Repairs, &c.

I should recommend immediate steps being taken for the repairing of carriages, &c., of such batteries as may require it, for the execution of necessary repairs, and for the completion of the proper equipment of small stores, &c.

##### Harnessing, Driving, &c.

Careful instruction seems to be much needed in the minor details of harnessing, driving, riding, &c. These, though very essential, are apt to be overlooked, and I can only propose as a remedy for these and other similar defects, that greater inducements be held out to officers and non commissioned officers to attend the School of Gunnery, where, alone, such details can receive the attention they require. The issue of pay according to rank while at the School of Gunnery, would, I think, be greatly conducive towards the desired result.

##### Garrison Batteries.

From my inspection of the three Garrison Batteries, previously mentioned, I am quite able to concur in the opinion expressed by Lieut. Col. French in his last report, as to the expediency of bringing all garrison batteries into forts for proper instruction in artillery exercises and for discipline.

Should, however, that not be found practicable, the efficiency of these batteries would be greatly increased by issuing to each of them two 18 pounder siege guns on travelling carriages. They could then join a Brigade Camp and perform annual gun practice.

In concluding my report on the inspection of the above mentioned batteries, I have the honor to inform you that, from what I have observed, I am led to thoroughly endorse the recommendations made by Lieut. Col. French in his last report, pages 38 and 39, Annual Report for 1873, relative to this subject.

I would also beg to state my unqualified satisfaction with the general appearance and efficiency of these batteries, and with the zeal and *esprit de corps*, which appears to animate all ranks, leading them to great exertions in endeavoring to perfect themselves in their sometimes arduous duties.

I have the honor to be, Sir,

Your obedient servant,

D. T. IRWIN, Major.

Com. School of Gunnery,  
& Asst. Insp. of Art'y  
for Province of Ontario.

The Deputy Adjutant General,  
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(To be Continued.)

#### Cable Iron.

The efforts just now in Congress to abolish the Washington Navy-yard are calling forth all that can be said *pro* and *con* in regard to it. Without desiring to go into a general discussion of all the important reasons why it should be continued and its operations enlarged by appropriations, there are some facts which are not generally known, either to members of Congress or to citizens of Washington, which, in a national point of view as well as a local interest, should be laid before the readers of the *Republican* in a just light. Chief among the considerations of a national interest, and which are destined to accomplish very important results in the Navy Department, are a series of experiments now being made under the superintendence of Commander Beardslee involving the strength and durability of iron. These experiments are thoroughly practical, the results of years of study into the nature and uses of iron in the Navy, and have been rendered necessary, in the opinion of Commander Beardslee, from the existence of certain serious defects in the laws and practices of the Department, among which is the practice of purchasing iron under contracts awarded to the lowest bidder.

These contracts allow a great deal of inferior iron to be supplied, and the tests made use of for ascertaining the strength of the material fail to prevent the use of these inferior qualities of iron. Commander Beardslee has succeeded in combining scrap iron, old boiler plate and other comparatively worthless material by a process of his own so as to produce iron of the very best quality. He has succeeded, also, in improving the quality of inferior iron, and reducing the various qualities to a uniform strength. He has invented several useful experiments for testing the strength of iron. In conducting these experiments and tests he has practiced mostly upon chain cable, as in cable the greatest and most uniform strength is required.

The standard adopted throughout the world as the strength of chain cables is the so called British Admiralty breaking strain, being a steady, uniform strain in the direction of the fibres of the metal. The test is found to be defective. Experience proves that an iron that will stand this severe strain without breaking—when subjected to sudden shocks breaks readily. It is also shown