

1886.
NEW ZEALAND.

REPORT ON THE NEW ZEALAND FORCES

(BY SIR G. S. WHITMORE, K.C.M.G., COMMANDER OF THE FORCES).

Presented to both Houses of the General Assembly by Command of His Excellency.

The COMMANDER of the COLONIAL FORCES to the Hon. the MINISTER of DEFENCE.

SIR,—

1st May, 1886.

I have the honour to furnish you, for the information of His Excellency the Governor, with my annual report of the state of the New Zealand forces.

I undertook the command on the 27th of April last, at a time when public attention had been drawn to the defenceless position of the colony in the event of an attack from without. At that moment the rifle muzzle-loading guns procured in 1878 were the sole reliable weapons in this colony with which to arm our ports, and these were not yet mounted. Plans of fortifications to protect the four chief ports had been drawn up, chiefly on the lines of His Excellency's recommendations, and a complete armament of guns of the very newest type—only, in fact, just being procured for Her Majesty's service—was ordered from Home; together with complete equipment in the shape of rapid-firing and machine guns, Whitehead torpedoes, and submarine requirements, with spare ammunition both for reserve and practice. The Agent-General was told, later on, when war appeared less imminent, not to hurry deliveries of the heavier guns, as it would take time to prepare the emplacements for these weapons; but he was, at the same time, told to forward at once the Snider ball-ammunition—of which the supply was almost exhausted—and the submarine appliances, which it was very desirable to have at once at each port, in order to teach and practice the torpedo corps. Such a corps not only requires much time for selection and training, but to be continually exercised and kept up to the daily improvements and discoveries in that scientific branch of the service.

As none of the stores above-mentioned have reached the colony as yet, except 300,000 rounds, out of 2,000,000 ordered, of Snider ball, it has been necessary to improvise, and even—in the case of some of the more delicate electrical instruments—to purchase in Melbourne, at an enhanced price. The delay in supplying these requisites has been unaccountable, inasmuch as almost everything required for the torpedo department must be at least as procurable in England as in Australia, at about 30 per cent. less cost. We have temporarily surmounted the difficulty by improvising one complete set for instruction of the more essential parts of the torpedo requirements, and must wait till the stores for the several ports arrive before we can hope to teach the Naval Volunteers at each port more than elementary torpedo work. The difficulties which have beset Major Boddam in organizing and providing instruction for the torpedo corps have been very great. He has been well seconded by Mr. Lodder, and has selected an excellent practical body of men, who will be able, when distributed at each port—as is already done to some extent—to begin at once to teach the Naval Volunteers. If the appliances nearly a year ordered from Home arrive soon, by the time the navals have learned the rudiments we shall be able to teach them the higher branches of submarine engineering.

The colony possesses on issue about nine thousand rifles. The regular allowance of ball cartridge for these for practice is 100 rounds per arm. In June last the stock was under 600,000 rounds; 300,000 rounds have since arrived, which, with what we had on hand, has barely sufficed for practice, and the magazines throughout the colony are now quite bare. Including the ammunition paid for by rifle associations and rifle clubs, the annual supply of ball cartridge required is about 1,200,000 rounds, and there should always be at least a million rounds in store; in fact, but for the circumstance that, through your exertions, a local factory has been established, I should say that even a million rounds is a very small reserve to keep. Finding that, in spite of many letters and cablegrams, the ammunition did not arrive, you authorized an order for 500,000 rounds to be given to Captain Whitney, an Auckland manufacturer, who was to use Otago powder. This latter, however, for some reason, failed, and Captain Whitney, in September last, when he should have begun to deliver, was unable to do so till a supply of powder was procured from Home. He has since obtained it, and, although the first cartridges turned out were defective in some respects, he has now remedied the defects, and experiment here shows the Auckland cartridges are in no respect inferior to the Home ones, while the cases can be refilled, which the War Office cartridges cannot. Captain Whitney's price is one-third higher than the Home price, but the economy of refilling the cases may in some measure compensate for the difference of first cost. Captain Whitney can also make, if required, cartridges for Nordenfeldt and Hotchkiss rapid-firing guns, which in time of war would be of great consequence.

I have not yet heard of any ascertained success in the manufacture of suitable powder in New Zealand, though encouragement is offered.

The artillery corps, till very recently, has been chiefly employed on the works since last spring; but before that, was, and now is, being taught its special duties. At every station there are now men competent to train Artillery Volunteers to the use of garrison guns.

All the special corps have been trained under the supervision of Major Boddam, who has spared no time to the work that he could possibly devote with due regard to the construction of the fortifications, the progress towards completion of which can best be understood from his report, which I append.

VOLUNTEERS.

On the 31st March, 1885, the Volunteer Force stood as follows: 4,977 of all ranks, exclusive of cadets, in 93 corps. On the 31st March, 1886, the force amounted to 8,253 of all ranks, exclusive of cadets, in 141 corps. These troops, with what was called the Armed Constabulary Reserve, amounted, in all, to 8,606 men and officers of all ranks. The 141 corps of all descriptions were not at first united into permanent battalions or brigades.

It was my duty to inspect and organize this force, and to-day we have at all the chief centres properly-formed battalions and brigades. In each of the larger provincial districts field officers and adjutants have been appointed to each battalion, and the drill-instructors have been increased. The naval corps have been united in divisions under captains commandant, while to the whole of the naval force has been allotted one honorary commodore, and it is intended to have two vice-commodores. The artillery has been subdivided into two brigades, three batteries of which, the L, N, and O, it is hoped will form garrison batteries; while the rest will become field batteries. Appended is a list of the field ordinance now in the colony, six 9lb. breech-loading guns having recently arrived. Twelve more have also been ordered by you, which it is hoped may arrive before next spring. We are still short of practice ammunition for these guns, and have no reserve, but a supply has been long sent for. I think the Artillery Volunteers a splendid body of men, and efficient in the use of their guns, though they have had much to discourage them in the want of enough suitable arms.

The cavalry organization is still incomplete. I think a squadron should exist to the south and another to the north of the Waitaki—the allowance for which is authorized, though the corps are incomplete—and at least as large a force, comparatively, in the North Island. The elements for enregimenting these troops without adding to the capititation exist already, and it only remains to find suitable officers and drill-instructors to make this arm equal to the other arms of the service.

The engineer force is more difficult to provide for, but we have very good material, and three excellent corps. Two of them proved at Oamaru that they were quite able to accomplish any of the duties of field-engineering. I think at present, however, and until the navals have been trained to torpedo-work, it is not necessary to employ the engineers on this branch of defence.

It must be remembered that the equipments available in the colony are mostly from twenty-five to thirty-five years old, a legacy from the Imperial army; and I find in many companies that the officers and men are, not without cause, impatient at being unable to exchange worn-out, useless belts for new ones. Some are extremely bad. We expect more, it is true; but buff belts cannot be got in Australasia, and our orders for these requisites are very long in arriving.

I inspected the Auckland Volunteers, first of the force, on the 15th of August, 1885, when the turn-out was very good, on the whole. The crowd made manœuvring impossible; but, considering how short a time had elapsed since the bulk had been enrolled, the men made a most creditable appearance. The absentees were mostly men not yet clothed; but I requested in future that all should turn out. My next large inspection was at Dunedin, on the 7th of October, where a better turn-out would have been secured if one or two firms, employers of labour, had not forbidden their men to attend. The movements of the battalions (at that time not finally formed) were very good indeed. At Invercargill, which I visited on the 3rd October, there were few absentees, and the parade was in all respects very satisfactory. At Christchurch the number on parade was very large, and absentees unaccounted for very few. The crowd here, as at Auckland, hindered the evolutions of the force, but only from want of knowledge of where to stand, as it was evident great interest was taken in the Volunteers. I especially wish to note that the cadet corps here was a most admirable one. At Nelson, which I inspected on the 17th October, the crowd did not in any way interfere, and Lieut.-Colonel Pitt's Force was admirably handled. He is an excellent officer, though he was not trained in the school of Her Majesty's service. There were, here, less than 3 per cent. of absentees, and all, down to the smallest cadet, seemed to be well trained to their work. At Blenheim, too, on the 21st, the turn-out was good, and the men, considering that many of them belonged to country corps, made a creditable appearance. Wellington, from what cause I cannot say, has hardly its proper number of Volunteers, except in the naval branch. In my opinion, another rifle and a garrison artillery corps are needed—the former to increase the battalion, the latter to serve the guns of position, and to free the Naval Volunteers for their more legitimate work. At the inspection at Wellington, which I carried out on the 29th of October, there was less public interest taken in the Volunteers than elsewhere. The artillery, navals, and rifle corps were excellent, especially the two first named; while the Heretaunga Light Horse left something to be desired, which I hope has since been supplied. On the 9th of November I attended the military display at Auckland, which I reported to you fully at the time, and which was a great test of Volunteer spirit, as the troops were exposed to extremely inclement weather. The inspection of Oamaru I had to delay till the 5th of January, as my time did not admit of my making it on my first visit to the South Island. I found the men well-equipped, and fairly forward in their drill. Here, as at Timaru, the field battery had a reasonable ground of complaint, having but one howitzer to drill with. This deficiency has been complained about so often that I need only say that the men of the battery were, notwithstanding, quite up to the high average of all the other batteries of the regiment throughout the colony. I inspected the Napier force on the 11th November. Though excellent in the several corps, the men had not acquired much facility in acting together—a fault easily overcome by practice, and which, I learn, is being remedied. The last inspection I made was on the west coast of this Island. Here, of necessity, I had to inspect the forces at several centres, and at all, except Wanganui, there were remarkably few Volunteers absent. At Wanganui, on the 19th of March, the movements left nothing to be desired; and the Alexandra Cavalry, though twenty-three were

absent, were the best of that arm I have inspected. I hope that the absence of so many men will not be repeated. I learn that the corps, when nearly all present at the camp, was equally remarkable for its efficiency and good drilling, so that I saw a fair sample at the inspection. The rest of the Wanganui corps were not all present, it is true; but the absentees were not in the same proportion as the cavalry, and many circumstances accounted for them, such as the Wellington regatta. At Marton, on the 20th March, I had the best turn-out in the colony, not excepting Nelson—one corps having every man present, and, in all, less than 2 per cent. absent unaccounted for. The Wairoa Light Horse, at Waverley, on the 22nd March, drilled exceedingly well; and at New Plymouth, on the 23rd March, the corps—principally country corps—moved excellently. All the West Coast corps drilled so well as to reflect great credit on their veteran commanding officer, Lieut.-Colonel Stapp, who has worked indefatigably, and with marked success, to render them efficient. I have been as yet unable to visit the Hokitika or Wakatipu Lake corps, or the Wairarapa—my time, owing to my detention with Admiral Tryon, C.B., not having sufficed. But I am led to believe that at least all the first-named corps are excellent ones.

New Zealand possesses a very considerable force, being equal in point of numbers and, some tell me, in efficiency to the whole of the recognized forces of the sister colonies put together. Yet neither in respect of expense nor of paid permanent staff is the force so costly as that in Australia.

Our regulations for garrison corps—our most highly-remunerated Volunteers—only prescribe twelve obligatory drills per annum, four of which must be daylight parades. This would be wholly insufficient, if the Volunteers confined themselves to it. But the spirit of the men, and the emulation caused by camps, induces the corps to exceed the stipulated number of drills very considerably in most cases. At Home Volunteers have thirty obligatory parades, and I think at least twenty should be insisted upon here. Country corps cannot be expected to drill so often, having often great distances to go; and the honorary corps are without the least State aid, and are put to great expense. I recommend the absorption of these latter in the larger centres into garrison corps, if they should fail to keep up their numbers, and cannot be made garrison corps. The Volunteer system of New Zealand is most faulty in its officers. We have tried this year to improve it in this respect and to do something towards the education of the officers. But, with no funds to carry out the scheme, it has proved almost impossible to do much. I recommend the Government to make some provision to render the education and examination of the officers a reality, by providing the means of educating them not only in their drill, but in their musketry instruction. The artillery officers have practically no instruction: it is a large field, and artillery text-books of a simple character are much needed. The promotion to the adjutancies and higher ranks should be purely by merit and efficiency, and removed alike from election by popularity and outside influence. This can only be achieved by competitive examinations with competent examiners. I have no hesitation in saying there are officers in New Zealand quite able to lecture to and examine officers, with the best results, if we can apply a moderate sum to recompense them for their time. The torpedo corps and permanent artillery, small as their numbers are, are quite able to instruct at all events the most necessary and elementary parts of their special work. But we lack the means of providing for musketry instruction and the rest of the duties of officers, so as to give them a fair chance. This question, I understand, is to be submitted to the liberality of Parliament; and I think, if the provision proposed is made, we shall be able to make the officers as efficient as the men, proportionately, which is not the case at present at all universally—though, of course, there are many brilliant exceptions through the force who are excellent officers. These gentlemen, however, would feel more encouragement to persevere if promotion hereafter was assured to them not by seniority but by open competition. The election of company officers by the corps is unique in the British dominions: it has its drawbacks, and these can only be removed by insisting on examination prior to the issue of commissions. What is further wanting in a citizen force, which can but rarely get time to drill, is what in military services is usually gained by position drill. This is of less importance for actual service than good shooting, discipline, and movement; but it has its value notwithstanding. I think the establishment of cadet corps, with or without compulsory calisthenics and drills, at the public schools, would produce a body of well-set-up young men as recruits for the Volunteer force hereafter. It seems quite worth while, as the colony gradually reduces its permanent paid forces, to encourage cadet corps.

I have observed that the Naval Artillery Volunteers are always anxious to acquire any experience that may be of use, but prefer work on the water when possible. Naturally they must be the torpedo-men of our harbours in war time, and their boats must form the guard boats to protect our mine-fields. When possible, I think they should be supplied with Nordenfeldt machine guns, and, if arrangements can be effected without too great a cost, assisted to get open steam launches from which to use them. For this year, however, perhaps it will be enough to train them to torpedo-work, and to secure a machine-gun for each port, that they may learn the arm. As the ammunition is not a difficulty in this case, I would prefer a multi-barrel machine gun, even though its range be less, for the special duty of preventing enemy's boats and launches from interfering with our submarine defences.

In conclusion, I have great pleasure in stating that, speaking of the force as a whole, great progress has been attained this year. There are battalions already quite equal to those of the English Volunteers. If the shooting is not quite as good as it might be, it must be attributed to the want of good ranges and proper musketry instruction, both of which are procurable, and are, I gather, to be asked from Parliament. The cavalry is well mounted. The artillery, if one corps at each port becomes a garrison battery, and the guns you have ordered arrive, will no longer suffer discouragement from not having enough guns. The Naval Volunteers, who, as a rule, almost without exception, work admirably, do not seem to require much pressing to learn torpedo-work. The regular infantry are improving everywhere daily, and I trust their equipments may reach the colony before spring to replace the unserviceable belts. The Martini-Enfields ordered by you, when issued to the best shots as an encouragement, and gradual mode of replacing the Snider, together with musketry instruction, will complete all that is wanting in the shooting, if only the

necessary ammunition can be procured; and I am happy to say there appears to be every prospect that cadet corps will readily respond to your invitation to enrol. Reforms in a Volunteer Force cannot be achieved as soon as in a paid standing army; but in our Volunteer Force there has been so much progress already, since the Russian scare showed how unprepared we were, that I think I may regard its future with confidence and hope.

The policy of the Government has been throughout the year to withdraw the Constabulary gradually from Native districts, and at present there are but two places at which any force is kept up, viz., Kawhia and Opunake. The men, as they became released from duty in Native districts, have been largely employed on the fortifications. Three special corps, however, have been formed, and taught the duties of these branches, which are distributed among the four ports. We have, in all, an excellent artillery force of 120 men, an engineer force of twenty men, and a torpedo corps of fifty men. Beyond these numbers, the Armed Constabulary Reserve was intended to consist of 160 men, or 350 in all—a reduction of fifty men since last year. The artillery force has now been wholly withdrawn from the construction of the fortifications, and is being taught artillery duty exclusively. The torpedo corps was assembled in Wellington only in October last year, and men had to be tested and enrolled or rejected after trial. It was necessary to obtain artificers and experts in several branches, and to teach practical torpedo-work without trained instructors. This has been done satisfactorily, under the supervision of Major Boddam. Mr. Lodder, who had some experience of torpedo-work in the Royal Navy, has qualified himself in these few months to be an instructor, and has brought forward his corps very satisfactorily. Major Boddam has collected enough electrical apparatus for purposes of instruction, and, when the whole of the appliances sent for to England for each port arrive, the small nucleus of a torpedo corps at each port may be relied upon to take charge of the delicate instruments and dangerous explosives expected, which can only be safely handled by experts.

Both the artillery and torpedo corps are intended, when on a peace footing, to consist of the fewest men sufficient to keep the guns, stores, machinery, and electrical instruments in order and at all times fit for use. It is intended, as at each port the detachments of these two corps will be complete in themselves, to utilize them also for the instruction of the Volunteers. At present the number of the paid corps are wholly insufficient to man all the guns, or to lay down and guard the submarine defences; but in war time the Volunteers, if called out for actual service, would have acquired a knowledge of the scientific branches, which cannot be learned without careful practice and instruction. The corps themselves could easily be expanded at any moment of danger, inasmuch as each nucleus kept comprises in its ranks a few thoroughly competent non-commissioned officers and artificers, as well as others little inferior to them, but holding minor grades at present. Therefore it would only be necessary to enrol, if the corps were increased, men possessing a sound physique, good character, and average intelligence. In this colony such men can be obtained at any moment, and in every district in a very few days.

The engineer corps, as yet, has been wholly employed on the works. The men are an excellent body of artificers and artisans, and at present have still important work to do in their several trades upon the works. When these are completed they will be practised in the more purely military duties of their branch of the service.

The Armed Constabulary Reserve, as it has hitherto been called, is thus more than half absorbed in the three scientific corps already described. The remainder it is intended to style "Rifles," and to employ in Native districts, and upon the fortifications. It would, if required for service, be formed into two companies; but its organization would comprise smaller subdivisions, each of which would be capable of expansion at short notice into a company, if required. At present all the labour required on the fortifications, except at Wellington, is being carried out by the unemployed, who have, as a rule, in the opinion of the engineers, done good work. At Wellington all that remains of the Armed Constabulary Reserve, and not serving in the scientific corps or in Native districts, is concentrated and supplies the labour required at Ngahauranga, Fort Ballance, and Point Halswell.

I am pleased to be able to report that all the officers posted to the scientific corps have worked and studied hard to render themselves proficient in their special branches. Major Boddam reports favourably of the progress each of them has made.

In the creation of these corps we have not had to go outside of the colony for officers, instructors, or men; and I am assured that the force will compare favourably with similar ones elsewhere in these colonies, notwithstanding that so much of the time of the artillery has been occupied in fortification work, and the torpedo corps much delayed in its training by lack of appliances.

I beg to say, in conclusion, that in Major Boddam the colony possesses an officer of singular energy, ability, and versatility of talent. Works on so large a scale were probably never attempted in so many distant places by any Government with so small an amount of supervision, and the incessant labour devolving on Major Boddam, and got through by him, is almost incredible. Much that he is compelled to do besides his own work elsewhere would be the duty of subordinates; and to carry out all he undertakes, with such materials as are to hand, requires a fertility of resource and ingenuity few possess. Notwithstanding all his occupations he has, however, found time to take a great interest in the selection and supervision of the torpedo corps, artillery, and engineers, and much of the good results attained in those corps is due to him. It is only just that I should call attention to the very great assistance rendered by the Public Works Department in permitting the District Engineers, in addition to duties already onerous in themselves, to assist the Defence in its fortification work. Without exception these gentlemen have given the greatest satisfaction to Major Boddam, though they could only spare a portion of their time to duties which elsewhere would be deemed ample for a separate engineer officer. One of them, Mr. Lowe, has suffered greatly in his health from his overwork, and all have devoted themselves to carry out this great amount of extra work without remuneration.

The Hon. the Minister of Defence.

I have, &c.,

G. S. WHITMORE.

RETURN of VOLUNTEERS to the 31st March, 1886.

District.	Garrison Corps.													Country Corps.	Honorary.	Corps.	Total.	Corps.	Cadets.	
	Corps.	Cavalry.	Corps.	Mounted Infantry.	Corps.	Naval Artillery.	Corps.	Artillery.	Corps.	Engi-neers.	Corps.	Rifles.	Corps.							
																				Corps.
Auckland	1	43	1	47	4	293	2	140	1	48	7	490	3	143	6*	384	24	1,421	..	..
Waikato	1	63	1	..	..	..	..	..	..	..	..	..	1	43	..	..	3	153	..	..
Taranaki	1	68	..	..	..	..	..	..	..	..	..	102	..	..	..	..	1	68	..	..
Patea	1	56	..	..	..	..	..	..	..	..	..	..	1	48	..	..	3	150	..	..
Wanganui	1	63	..	..	1	50	..	..	..	..	2	151	..	..	..	..	2	104	..	..
Rangitikei	1	..	..	..	..	..	..	..	..	..	..	65	2	99	1†	62	4	264	..	..
Wellington	1	54	..	..	2	124	1	54	..	..	4	229	1	40	..	..	4	226	..	..
Wairarapa	..	..	..	..	..	..	..	..	..	..	..	..	5	191	..	..	5	501	..	..
Napier	..	..	..	..	1	53	1	54	..	..	1	67	1	55	..	..	4	191	..	..
Poverty Bay	..	..	..	..	1	..	1	37	..	..	..	..	1	53	..	..	2	229	..	..
Thames	..	..	..	..	1	82	..	..	..	..	1	64	..	..	..	..	2	146	..	..
Total North Island	6	347	1	47	9	602	5	285	1	48	18	1,098	16	720	7	396	63	3,543	9	529
Nelson	..	..	..	..	1	64	1	59	..	..	2	182	1	47	..	..	5	302	1	50
Marlborough	..	..	..	..	2	135	3	186	1	..	1	67	1	52	1†	43	3	162	2	66
Canterbury and South Canterbury	1	78	1	40	..	73	1	66	..	54	8	559	5	310	3‡	170	24	1,532	3	148
Oamaru	..	..	..	..	1	190	2	125	1	..	2	154	1	38	..	..	5	331	4	320
Dunedin	1	59	..	..	3	190	2	125	1	70	7	511	9	416	3	150	26	1,521	4	367
Invercargill	1	60	..	..	1	54	1	62	..	..	1	84	1	49	1	53	6	362	..	..
Lake	..	..	..	..	..	..	..	..	..	..	..	..	3||	141	..	..	3	141	3	129
Westland	..	..	..	..	2	122	..	..	..	..	2	133	2	104	..	..	6	359	1	58
Total South Island	3	197	1	40	10	638	8	498	2	124	23	1,640	23	1,157	8	416	78	4,710	18	1,138
Total all New Zealand	9	544	2	87	19	1,240	13	783	3	172	41	2,738	39	1,877	15	812	141	8,253	27	1,667

* Includes two Cavalry Corps and one Naval Coastguard. † One Mounted Infantry Corps. ‡ One Cavalry Corps. § One Honorary Reserve Corps. || One Artillery Corps.

RETURN showing Distribution of Ordnance in New Zealand on the 13th May, 1886.

New Zealand Regiment Artillery.	FIELD GUNS.				24-pr. Howitzer on Ships' Carriages.	GARRISON GUNS.						4 2/5ths Mortars.
	R.B.L.					R.M.L.			Smooth-bore.			
	12-pounder.	9-pounder.	6-pounder.	24-pr. Howitzer.		7-ton 7-in.	64-pounder.	64-pounder converted.	32-pounder Iron Gun.	24-pounder Iron Gun.	12-pounder Iron Gun.		40-pr. R.B.L. Armstrong.
A Battery, Auckland	2	..	..	..	..	..	..	..	..	..
B " Dunedin	2	..	..	1	..	..	..	..	..	..	..	..
C " Timaru	1	..	..	..	..	..	..	..	..
D " Wellington..	3	..	..	..	..	..	..	..	..	..
E " Christchurch.. .. .	1	..	..	1	..	..	..	..	..	..	..	..
F " Napier	2	..	..	..	..	..	..	..	..	2
G " Invercargill	1	..	..	1	..	..	..	..	..	..	..	..
H " Nelson	2	..	1	..	..	..	..	..	..	..	..	..
I " Oamaru	1	..	..	..	..	..	..	..	..
J " Gisborne	1	..	..	..	..	..	..	..	..	..
L " Port Chalmers	2	..	..	..	..
M " Queenstown	1	..	..
N " Lyttelton
O " Auckland
Now being landed from ship "Oamaru," to be issued immediately	6	..	..	..	..	..	..	..	..	..	..
<i>Naval Artillery.—Guns temporarily issued—</i>												
Auckland	3	..	1	..
Thames	2	..	..	..	..	..	..	..	..
Wellington	1	..	..	..	..	..	..	..	..	..
Petone	1	..	..	..	..	..
Nelson	2	..	..	..	..
Lyttelton	1	..	..	..	..	..	..	..
Timaru	2	..	..	..	..
Oamaru	1	..	1	..	..	..
Port Chalmers	2	..	..	..	..
Dunedin	2	..	..	..	..	..	..	..	..
Bluff	2	..	..	..
Hawera Rifles	1	..	..	..	..
<i>Garrison Permanent Artillery.</i>												
Wellington	3	3	..	..	..	..
Auckland	3	3	5	..	..	..
Dunedin	3	3	..	..	..	..
Lyttelton	2	2	..	..	..	..
In store	1	..	..	9

REMARKS.—The L, M, N, and O Batteries have no field guns on issue to them. The Wanganui, Napier, Westport, and Peninsula Naval Artillery have no ordnance on issue to them.—S.C.A.

Major BODDAM to Colonel the Hon. Sir G. S. WHITMORE, K.C.M.G.

SIR,—

Wellington, 12th May, 1886.

I have the honour to submit the following report on the progress which has been made in the defence of the colony since I took over charge of the works in June last.

State of Defences, June, 1885.—At the date above mentioned the several muzzle-loading guns (7-inch and 64lb.) which were in the colony had — with the exception of two, one at Dunedin and one at Lyttelton—been placed in position; in some cases timber magazines had been constructed or partially so, and a great deal of preliminary work in the way of roads, tramways, &c., had been carried out. In the case of the batteries at Point Resolution, and St. Clair, Dunedin, the general plan of the work had been decided and to a considerable extent carried out. In all other cases no regular designs had been worked out, and the work had been set out and decided upon as it actually progressed.

Designs.—There were designs for several large works in the office, but, owing to the sudden change in the proposed armaments for the works, and the mounting of the guns in different positions from those previously determined on, these could not be made use of; and, as no working drawings or suitable details were to hand, I have had to re-design the whole of the works; and the necessity for fitting the additional guns on to works already in progress has necessitated the preparation of many more plans, and also much more labour in their preparation, than if the works had been commenced *de novo*.

Old Works.—The 7-inch and 64lb. guns were mounted on sliding-carriages, and were arranged for firing *en barbette*, the larger guns being loaded from a loading-stage, and the others by depressing to a great angle and using jointed or flexible side-arms. Both systems expose the detachment considerably, and, as the greatly-increased effect given to a ship's fire by the introduction of rapid-firing and machine guns has now to be taken into consideration, it was considered advisable to provide for side under-cover loading. I have consequently designed pits and altered the fittings of the guns to effect this purpose. These have, I consider, added immensely to the protection given to the detachments, and also to the accuracy and rapidity of laying the guns. With the exception of those at Point Halswell, one at Lyttelton, and one at Dunedin (both in progress), these are all completed. The magazines for all these guns have also now been completed and properly fitted. The timber work has been well

protected by concrete; and in those cases where the magazines were not commenced I have provided brick and concrete structures. These practically cost no more, are imperishable, and in every way more suitable for the preservation and service of the ammunition.

New Works.—In addition to the works necessary for the guns already in the colony, complete designs have been prepared and works are well in hand for mounting fifteen out of the twenty-three new guns which have been ordered. These works are all of a thoroughly permanent and substantial nature, admit of complete protection for the men working the guns, are provided with very suitable magazines, and efficient systems for the rapid supply of ammunition, and will also be well protected from assault. In all cases where necessary, proper provision has been made for the accommodation of a sufficient garrison in the works, and proper shell-proof cover is provided for them during an action. I might add, at the same time, that no superfluous work has been done or expense incurred which could possibly be avoided. We have done away with the heavy brick arches usually heretofore adopted, and substituted old rails and concrete, at a reduction of about one-half in cost; and in many other instances made considerable reductions in cost of materials and labour, without impairing in any way the efficiency of the work. Designs have also been prepared for the mounting of the whole of the machine guns provided. These being mounted in well-protected pits and covered by steel-shields will render their fire most difficult to silence, and will effectually prevent any attempt at removing the submarine obstructions from being successfully carried out. To give the maximum effect to their fire, and also to enable them to cover a large extent of water, duplicate pits have been arranged, and means of conveying these rapidly from one position to another. Protection against landing in the vicinity of the batteries has been added to by the provision of several guns of this type (rapid-firing), mounted on travelling carriages. In some cases these will require to be horsed; but on the west side, at Wellington, and on the Ocean Beach, at Dunedin, they can be conveyed from point to point by steam, some of the present trucks on the lines being altered, at a trifling cost, for this purpose. Sufficient machine guns have also been provided to arm a guard-boat at each port; if additional protection were provided by arming the local launches with the field guns in the colony, an efficient defence could be made against any attempt at a boat attack having for its object the destruction of wharves or shipping. The carriages of these guns can easily be altered.

Submarine Defences.—Practically there were, on my taking over charge, no submarine defences. Twenty-five ground-mines had been supplied from the Naval Dépôt at Sydney, but, although these were laid down, and the work was most excellently planned and carried out, the appliances were totally inadequate, and no means were at hand for providing any permanent system of defence. A complete system of defence has now been designed for each of the ports, and very perfect equipments of submarine mining appliances and stores ordered from the War Department. Proper stations have been designed and are in course of construction at each port. These comprise all the necessary sheds for the storage of the appliances, slips and sheds for the torpedo-boats, cable-tanks, gun-cotton tanks, workshops, test-pits, jetties, cranes, and launches, where necessary. These are all most necessary, and will enable the mines and cables to be laid out with the greatest expedition during war time, and also for the torpedo corps and the Volunteers to be thoroughly instructed in their duties during peace. Immediately on arrival of the plant the mines will be fitted and loaded, all cable and other gear prepared and connected, and then stored. It will be possible, with the accommodation and appliances provided, for the torpedo defences throughout the colony to be laid down within three days of the order to commence work.

Electric Lights.—Contracts have been entered into for the supply of the most approved and most powerful electric search-lights for the harbours of Auckland, Wellington, and Lyttelton, complete with all necessary engines, boilers, projectors, lamps, and fittings. These are expected to arrive within the current month, and will, when mounted, enable the defence of those harbours to be most efficiently carried out during the dark hours. The engine-rooms, test-rooms, observing-stations, &c., required for them have all been designed, and are in course of construction.

Expenditure.—The expenditure up to the end of the financial year was £127,169 10s. 3d. (*vide* Return A). The amount voted was £200,000; the balance—£72,830 9s. 9d.—unexpended will require to be re-voted. Return A shows the expenditure in detail under the several headings. Returns are also forwarded showing the amounts required for the works, and also the liabilities for the guns, mining stores, &c., and shows what will be required to be voted for the year 1886–87. A return is also appended showing original estimated cost of the works, the amount expended thereon, and the balance which will require to be voted during the current and also next year to thoroughly complete the works. It will be seen that from the original estimate a deduction of £41,000 was made for the work of the Constabulary, 200 of whom it was expected would be employed for two years and a half on the works. As this branch of the force has been very greatly reduced, and as it will consequently be impossible to carry on the works by them as originally proposed, a corresponding amount will have to be put on the Defence loan to cover this reduction. As a large annual saving of expenditure has been effected by this reduction, the extra cost of the works chargeable to loan can, I presume, well be authorized.

Summary.—During the past ten months very considerable progress has been made with the scheme of defence. Within the next six months, provided that they are supplied in time, fifteen out of the twenty-three guns ordered from Sir William Armstrong can be mounted, and the pits and batteries for them will be completed; and the whole system of defence will be in thorough working order well within the time stated by the Government. Within three months the whole of the torpedo stations will be ready for service, and the electric-light stations completed. The machine guns can also be placed in position as soon as they arrive. I have gone carefully through every recommendation or suggestion that has been made with regard to the scheme generally, and am of opinion that it would be inadvisable to alter it in any way whatever or necessary to add to it, and I think that the original estimates of expenditure will cover all requirements.

I have, &c.,

Colonel the Hon. Sir G. S. Whitmore, K.C.M.G.

E. M. TUDOR BODDAM, Major,
Engineer for Defences.

RETURN A.—Estimated Cost, Expenditure, and Balance requiring to be Voted for New Zealand Defences.

Description.	Works.		Armament and Stores from England.		Torpedo Stores.		Stores from Admiralty.		Whitehead Torpedoes.		Contingencies.		Totals.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.
1. Estimated cost of defences (vide Return A)	103,710	0 0	151,000	0 0	35,000	0 0	3,525	0 0	13,000	0 0	2,500	0 0	313,735	0 0
2. Actual expenditure on defences, 1885-86	65,942	0 0	39,008	8 8	2,953	0 0	6,295	0 0	8,387	0 10	1,323	12 4	123,909	1 10
Balance	37,768	0 0	111,991	11 4	32,047	0 0	2,230	0 0	4,612	19 2	1,176	7 8	189,825	18 2
3. Amounts required to be voted for 1886-87	30,000	0 0	69,000	0 0	22,047	0 0	2,230	0 0	4,612	19 2	1,176	7 8	129,066	6 10
4. Amounts to be voted in 1887-88	7,768	0 0	42,991	11 4	10,000	0 0	..	..	..	..	..	..	60,759	11 4
Totals	37,768	0 0	111,991	11 4	32,047	0 0	2,230	0 0	4,612	19 2	1,176	7 8	189,825	18 2

RETURN B.—Estimate of Total Expenditure for Defence required from the 31st March, 1885.

Description.	Auckland.		Wellington.		Canterbury.		Otago.		Totals.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.
1. Works in progress and to be completed in connection with 7-inch and 64-lb guns	13,160	0 0	17,031	0 0	5,169	0 0	9,650	0 0	44,910	0 0
2. Works contemplated—										
Emplacements and magazines for 8-in. guns	7,800	0 0	7,800	0 0	5,200	0 0	5,200	0 0	26,000	0 0
Emplacements and magazines for 6-in. guns	8,000	0 0	6,000	0 0	4,000	0 0	8,000	0 0	26,000	0 0
Barracks and buildings	1,700	0 0	1,300	0 0	1,300	0 0	1,700	0 0	6,000	0 0
Enclosing works	1,750	0 0	1,500	0 0	1,000	0 0	4,750	0 0	9,000	0 0
3. Lands purchased for works	2,000	0 0	2,800	0 0	700	0 0	1,800	0 0	6,800	0 0
Totals	34,410	0 0	35,931	0 0	17,369	0 0	31,000	0 0	118,710	0 0

Deduct expenditure	£	s. d.
Deduct amount allowed for Armed Constabulary labour	65,942	0 0
	15,000	0 0
	<u>£80,942</u>	<u>0 0</u>
Amount required to complete works	<u>£37,768</u>	<u>0 0</u>

RETURN C.—Statement of Liabilities on Orders for Material required for Harbour Defences.

Particulars of Ordnance.	Estimated Cost		Expenditure.		Liability due 1886-87.		Liability due 1887-88.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.
6-in. and 8-in. guns complete, and extra ammunition*	123,355	0 0	38,845	3 0	43,703	17 0	40,805	0 0
Twenty Nordenfeldt machine guns, complete	16,000	0 0	..	..	16,000	0 0	..	..
Twenty Whitehead torpedoes, with gear, &c.	10,500	0 0	8,387	0 10	2,112	19 2	..	..
Eight range-finders	250	0 0	..	..	250	0 0	..	..
Six 9-lb guns, complete	1,000	0 0	..	..	1,000	0 0	..	..
Ammunition for 7-in. and 64-lb guns	4,000	0 0	69	18 7	3,930	1 5	..	..
Ammunition for 2,000 Martini-Henry rifles, and extra 100,000 Snider rifle cartridges	9,472	7 10	92	7 3	3,880	0 7	5,500	0 0
Two Hotchkiss machine guns, &c., complete	1,500	0 0	..	..	1,500	0 0	..	..
Gun-cotton detonators, &c., for torpedo stores†	23,320	0 0	476	6 2	12,843	13 10	10,000	0 0
Ammunition for machine guns already in colony‡	650	0 0	0	19 10	649	0 2	..	..
Totals	190,047	7 10	47,871	15 8	85,869	12 2	56,306	0 0

* The final payment of the contract for guns will not fall due in 1886-87.

† The Martini-Henry rifles will not be supplied until after 1886-87.

‡ The £10,000 for Brennan torpedoes will not be required in 1886-87.

§ The balance of £35,000 for torpedo defence will be expended in the colony.

Balance	£	s. d.	Expenditure	£	s. d.
	190,047	7 10	Liability due 1886-87	47,871	15 8
			Liability due 1887-88	85,869	12 2
			Liability due 1887-88	56,306	0 0
	<u>£190,047</u>	<u>7 10</u>		<u>£190,047</u>	<u>7 10</u>

Wellington, 12th May, 1886.

E. M. TUDOR BODDAM, Major.

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