

1890.

NEW ZEALAND.

REPORT ON THE NEW ZEALAND FORCES.

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

The UNDER-SECRETARY for DEFENCE to the Hon. the DEFENCE MINISTER.

SIR,—

Defence Office, Wellington, 2nd June, 1890.

I have the honour to submit, for the information of His Excellency the Governor, Commander-in-Chief, my annual report upon the Permanent and Volunteer Forces of the colony, accompanied by reports received from Lieutenant-Colonel Hume, Inspector of Volunteers, and Mr. Bell, Engineer for Defences—the former dealing with the annual inspection, &c., of Volunteer corps and the latter with the general progress and construction of harbour-defence works.

Garrison Artillery.—The officers, non-commissioned officers, and men of this branch of the Force have undergone a course of instruction in drill and artillery duties which in previous years was not attainable, in consequence of the general and diverse work they had to perform in connection with the “construction” of batteries. The result has been a marked improvement in both drill and efficiency, and I have much pleasure in stating that this was favourably commented upon by Major-General Edwards, C.B., R.E., during his recent inspection. Recruits are, as heretofore, drilled and instructed at Head-quarters, Wellington, and they now undergo, in addition to physical and small-arms drill, the full course of training with the service guns constituting the armaments of the forts, as well as a course of musketry, signalling, and theoretical instruction, before being posted to outside batteries; and, owing to the zeal and intelligence which as a rule characterize the class of men who are enlisted, the results have been exceedingly satisfactory. An annual course of gun practice has also been established, and, although of a very limited extent on account of the cost of the ammunition, it is sufficient to habituate the men to the use of the guns with which they have to deal. Batteries have been manned and practice carried out in “fighting order”—that is, under the same conditions as those under which they would have to be worked in actual service; and the special training of “qualified layers,” as in force in Her Majesty’s service, has been carefully attended to. In order that the senior grades of the Force may keep up to the efficiency which has led to their advancement, it is intended to institute, under the Staff-Officer of Artillery, an annual examination or classification in practical and theoretical knowledge, so that the high standard so requisite in a small force may be maintained; and it is anticipated that the adoption of this course will not only produce thoroughly-efficient gunners, but will also provide a class of instructors who will be of incalculable value when called upon to deal with partially-trained men who may in time of emergency be detailed for duties in the batteries. The two Quartermaster-Sergeant Instructors of the Royal Artillery referred to in my last report have been transferred to the North Island Batteries, and the whole Artillery Force has now had the benefit of their valuable services. During the year twenty-six gunners have been transferred to the Police and eight to the Prisons Departments; and, if the system advocated that these transfers should undergo an annual training in heavy-gun drill, is adopted, a valuable reserve of trained artillerymen will always be available should it ever be found necessary to call upon it for duty in the batteries.

Torpedo Corps.—The training and instruction of the men of this corps has been systematically attended to both at Wellington and Auckland, and practice in running torpedo-boats, electric lights, and Whitehead torpedoes, and in firing submarine- and land-mines, has been successfully carried out during the past year. Mines have also been loaded, and the different stations are now so far advanced as to require but few works to place them in an effective state for the carrying out of submarine defence operations. The services of an Instructor from the submarine-mining branch of the Royal Engineers have during the past year been secured, and he is at present attached to the contingent of the Torpedo Corps stationed at Auckland. The want of specially-constructed submarine-mining boats is, however, a serious drawback, as with the present launches it would be quite impossible to lay mines in boisterous weather either at Auckland or Wellington. It is strongly urged that as soon as circumstances will admit this question should receive the serious attention it requires.

Armament Court at Dunedin Exhibition.—This court, the Artillery portion of which was supervised and carried out by Major Douglas, Staff-Officer, and Major Goring, No. 4 Battery, was a marked success, and from all quarters favourable comment has been made, not only with regard to the class of exhibits in guns, arms, electric- and submarine-mining, but also to the intelligence

and knowledge of their work displayed by the gunners and torpedo-men in charge of the court. The arrangement of the submarine-mining display was undertaken by Captain Falconer, as was also the lighting of the fernery and grounds by electricity, with one of our service dynamos. This merits special remark, as it was not only a novel departure from the usual routine, but also because during the whole period of the Exhibition the light was run without hitch or hindrance, proving conclusively that the training of officers and men of the Torpedo Corps in this portion of their duties has been both practical and successful. The planning of the court and the execution of the heavy work in connection with the mounting of the 6in. B.L. and 64-pounder M.L. gun, engine, and boiler for dynamo, &c., was undertaken by Mr. Bell, Engineer for Defences, with his usual ability, and successfully carried out by his able assistant, Mr. Watson, in charge of the district defence-works.

Conduct.—The conduct of the men of both branches of the Force has been, with one or two exceptions, excellent.

Volunteers.—Although there was a slight increase (34) in the numerical strength of the Volunteer Force on the 31st December, 1889, as compared with 1888—notwithstanding the disbandment or conversion into rifle-clubs during the year of no fewer than 17 corps—the fact that, out of 7,651 men returned on the rolls, only 5,779 earned capitation, does not admit of the results for the year being deemed very satisfactory.

On examination of the capitation-rolls it is found that this large proportion of non-efficients is mainly due to absence from daylight drills or practices.

As a rule, Volunteers turn out readily at night, and in such instruction as can be given in drill-sheds fair progress is made; but, unfortunately, this is not all that is required, as the military training of the present day necessitates an amount of practice by daylight for which Volunteers either will not give up their time or are unable to afford to do so for the rate of capitation now paid.

The attack-formation, laying of guns and mines, artillery and musketry practices are essentially subjects to which the above remarks apply, and, as they represent the cardinal points of a soldier's training, it is evident they should be carried out under such conditions as to permit the full benefit of the instruction imparted being obtained; this can only be successfully accomplished by frequent and continuous daylight drills. At present, in many districts, the daylight parades provided for by regulations are held at an unearthly hour in the morning; a hurried drill is gone through, to which little attention is paid owing to the anxiety in the minds of those present as to whether they will be dismissed in time to permit them to get to their daily work at the usual hour; and thus, while the required number of daylight parades are attended, the amount of actual training and instruction received by officers and men is of little moment.

There appears to be a general consensus of opinion that adequate compensation is not awarded to the Volunteer for services rendered, and that until this is done a well-trained and disciplined force will not be obtained. The recognition of this fact in neighbouring colonies has led to the adoption of the partially-paid system, as advocated by Lieutenant-Colonel Hume in his report of last year, and recommended by Major-General Edwards, C.B., R.E., who was much impressed by the success of the system when inspecting the forces of the Australasian Colonies. As this scheme has now been in force there for some years, with satisfactory results, there is little reason to doubt its success if established here.

While the regulations in force are, according to the general opinion of some of our best Volunteer officers, perfectly adapted to our present organization, the want of their uniform administration has much to do with the variable degrees of efficiency found in the several districts. The Queen's Regulations and Standing Orders of Her Majesty's army and of other services are accepted *sine dubio* as the laws which govern; but this is not so with the Forces in this colony, and it is almost a daily occurrence to receive from officers of the Force applications (too often recommended by their superiors) which, if concurred in, would render the regulations inoperative, and land the departmental administration in a chaos it would be impossible to cope with.

Although several of the smaller districts have of late years been absorbed into the larger ones, there are still thirteen districts in existence, commanded by as many officers; and it is to this excessive number, and to the different degrees of administrative power, that I attribute the want of uniformity at present existing, which is fatal to all recognised lines of military discipline and efficiency. I feel confident that if the districts were limited to one-fourth of the number, and the regulations more rigidly adhered to both in letter and spirit, a corresponding improvement would be the result.

I pointed out in my report of last year that one of the most important changes in the regulations dealt with Naval and Garrison Artillery corps, and provided for their training in the special work assigned to them; but I regret to state that my anticipations have been far from fulfilled, and that in no instance has full advantage been taken of the liberal instruction afforded, the opportunities for which, on every conceivable occasion, were made subject to the convenience and, I might even add, the whims of the corps.

Out of a strength of 951 at the four centres the following number of Naval Volunteers were passed as efficient in submarine-mining and artillery work, and received the extra £1 and badge of efficiency:—

					Strength.	Efficients.		
						Submarine-mining.	Heavy-gun drill.	
Auckland	...	...	...	...	321	24	...	0
Wellington	...	...	...	...	212	46	...	0*
Dunedin	...	...	...	...	278	0	...	1
Lyttelton	...	...	...	...	140	0	...	0

* Examination of Petone Navals not completed.

The results as regards heavy-gun drill, as will be seen, are almost absolutely nil, only one petty-officer, of the Peninsula Naval Artillery, Dunedin, having qualified and obtained the efficiency-capitation and badge. When it is considered that the manning of our forts and batteries in war-time would have to be undertaken by these branches of the service, it is evident that some radical change must be effected if any practical results are to be obtained, and I strongly urge that vigorous measures be adopted with regard to those corps which do not qualify for the duties for which they have been selected.

It is argued that the time it takes to proceed to batteries renders it impossible for men to attend practice and instruction; but, while this, to some extent, may be admitted, the batteries in most places are easily accessible; and, as passages by train, ferry, or departmental launches have always been authorised, it cannot be urged that efforts to meet the convenience of officers and men have been in any respect wanting.

The want, or rather absence, of any progress in the discharge of their duties by these corps I attribute in a great measure to the fact that officers commanding districts are not adepts in this branch of instruction. Heavy-gun drill is not one in which they take an active part themselves, and consequently the turn-out of the corps has been relegated almost entirely to its own officers; and the latter, with the exception of some of the subalterns (who were obliged to pass before they could get their commissions), have never, in most cases, made even the slightest effort to master the drill for which they have been detailed, and have not—as far as I am at present aware—at any time undergone the practical drill which can alone make them efficient to instruct and command.

In the case of O Battery at Auckland, the attendance of officers and men was all that could be desired, and some of the detachments, at actual gun-drill, were thoroughly efficient; but when it came to an examination of their knowledge of artillery questions and of their duties with regard to the ammunition, stores, &c., in connection with the guns they used (which are essential points in the training of an artilleryman), it was found that these subjects had not received the attention required to ensure proficiency in them.

Major Douglas, the Staff Officer of Artillery, has, when able to do so, attended drill and given lectures on gunnery; but his experience has been that the attendance of officers and men was so variable and irregular that it was quite impossible to expect any useful result, until a material improvement in the present unsatisfactory state of affairs had been enforced.

I may add that in Auckland and Lyttelton 64-pounders have been mounted in the drillsheds; so the drill of the gun might be carried out without going to the batteries. At Port Chalmers a similar gun, which was in the court at the Exhibition, has recently been mounted; and it is intended to place a 7in. gun in position at the drill-shed at Wellington.

Lithographs and diagrams of guns and ammunition, as well as samples of all ammunition in use, a full submarine-mining plant, &c., have also been supplied for the use of Volunteer corps, together with the various treatises on ammunition, equipment, &c., in use in Her Majesty's forces; so that every facility has been afforded to carry out the instruction of the members of these corps, with however, only the meagre results above stated.

It is true that at Wellington, Auckland, and Taiaaroa Heads camps were formed, at which there was a fair attendance; but, as all drill and instruction took place before 7 a.m. or after 6 p.m. (the men going to their ordinary work daily), an undue strain was placed upon both officers and men, with comparatively little result; so that, although these encampments may be considered better than nothing, I do not think they in any way compensate for the trouble and expense they entail, or that they can be considered, except in submarine-mining training, which is carried out on the spot, a success; and I feel confident that two or three full days' drill would give results which a fourteen days' encampment as described would not attain. While compelled to acknowledge that the attendance at these camps displays, on the part of all concerned, a readiness and willingness to undergo both inconvenience and discomfort, with little results, I am still of opinion that it would be a wiser and more practical expenditure of time and money if officers and men were remunerated on a scale which would permit them to devote the full day to their training and instruction.

There are some defects in our present system which, however, cannot be remedied until the existing Defence Act is amended. The election of officers by members of a corps is the most prominent, and as long as this prevails so long will practical discipline and efficiency be absent. At present the officer who really *commands* his men is the exception. The difficulties experienced in maintaining discipline in the various corps are not only in themselves by no means light, but are also increased by the easy-going proceedings and deficiencies in the qualities necessary for its enforcement; and those who have these qualities are, in consequence, heavily handicapped in carrying out that discipline which should be the first duty of every officer to uphold.

The public generally do not look upon volunteering with any special favour. The movement consequently suffers from this apathy, and, although these remarks may not apply with the same force to every district, yet there are very few in which great difficulty is not at times experienced by the Volunteer in getting the necessary leave from his employer to attend to his duties; I am even credibly informed that it is the rule in many large business firms to make it a condition of employment that the employé should not belong to the Force.

As long as the present Volunteer system exists this will be a difficult matter to remedy; but I feel confident that if a Volunteer-Militia system were introduced, as in some of the Australian Colonies, under which both employer and employé are liable to training in case of an insufficient number of voluntary enlistments, the difficulty would absolutely disappear.

It is to be remembered that our Volunteer Force is with us practically the first line of defence, and not, as at Home, the fourth; and it therefore behoves every citizen, in his own and the public interests, to submit at least to the temporary absence of his employé, if not to share and take his part in a movement so manifestly for the public welfare. Hitherto, for many years past, volunteering in the large centres has been looked upon merely as light amusement, not as a serious and practical service; but it is time these views were abandoned. Now that external aggression is

what has to be guarded against, the towns will be called upon to supply that defence which country settlers in their own interests were obliged to take up in times past.

Easter Encampments.—During the year 1889 encampments were held at Auckland (Hamilton), Nelson, Hokitika, Christchurch, and Oamaru, and, with an exception as regards Auckland, the reports furnished commented favourably upon the general conduct of the men and the duties performed. Although the encampments of the present year do not, practically, come within the scope of this report, yet as there has been some comment with regard to their limitation to the four centres it may be as well to detail the circumstances under which they were formed. Camps were ordered at Auckland, Wellington, Christchurch, and Dunedin, and, except as regards Wellington, the attendance was confined to corps whose headquarters were within a ten-mile radius of the town. This course was adopted for the purpose of testing the effect of a direct order for the assembly of corps, and to ascertain in what manner Volunteers would respond to it. The detail below gives the result, and the excessive proportion of absentees practically proves what has been virtually stated before, viz., that unless it suits the Volunteer he is not prepared to turn out without being compensated for his time.

				Strength.		Attendance.
Auckland	...	...	...	723	...	370
Wellington	...	...	...	480	...	270
Christchurch	...	...	...	869	...	456
Dunedin	...	...	...	800	...	307

Officers from other districts were detailed to attend these camps, and reports were furnished by them on the drill, discipline, order, &c., maintained. These reports, on the whole, were more favourable than was anticipated; but the various defects to which attention was drawn, though not of any great magnitude, proved that in many duties a closer regard to the recruit instruction of both officers and men was required. The excuses furnished by absentees for non-attendance embraced every conceivable plea, from *la grippe* to the attractions of the Dunedin Exhibition; inability to obtain leave from employers was noticeable by its frequency.

While the excessive number of absentees proves that some stronger stimulus than a £2 capitulation is required to ensure regular attendance, it is satisfactory to state that in every instance the excellent conduct of officers and men, both in and out of camp, was specially referred to by reporting officers. There is a unanimous opinion that a four days' camp, such as can be held at Easter, is not of sufficient duration for men to settle down steadily to their work, and that if it was extended to eight or nine days the training received would be more effective and lasting in its results; but, while there can be little doubt on this point, the proportion of absentees at the recent camps makes it apparent that it would be utterly useless to attempt any innovation of this kind under the present system.

It has been advocated that camps extending over a period of some days might be formed in convenient localities on the same lines as adopted by Naval Artillery Corps, viz., that men should sleep in camp, attending drill and instruction morning and evening, but proceeding to their work daily. I am still of opinion this proposal is better in theory than practice.

Arms, Stores, &c.—The force is still armed with the obsolete Snider rifles, many of which, from fair wear-and-tear, are in anything but a satisfactory condition, and it is to be regretted that this cannot be remedied until Magazine rifles are obtainable. The guns on issue to the field batteries of Artillery, consisting of 12-pounder and 6-pounder Armstrong and 9-pounder breech-loading, are all of old and obsolete pattern, and, while they have lasted admirably (some of them having been used by the Royal Artillery when stationed here), it is becoming daily more difficult to obtain stores, ammunition, &c., for them, as their manufacture at Woolwich has for the most part been discontinued; and I strongly recommend, when circumstances will admit, that weapons of later date be procured, with a proportionate supply of ammunition. Major-General Edwards draws special attention to this point in his report, and specifies the reserve of ammunition which in his opinion should be maintained. If the 12-pounder wire gun, weighing 5½ cwt., which is at present under trial by the Imperial Government proves a success, it would be thoroughly adapted for service in this colony.

On the 11th February, 1889, the Agent-General was communicated with and requested to transmit to the War Office a requisition for 2,000 Magazine rifles when the pattern adopted for Her Majesty's Forces had been decided upon; but, although it was expected that delivery would be made in March of this year, it has subsequently been notified that issues to Colonial Governments are not likely to be made until the beginning of next year. While this further delay is disappointing, it is consoling to know, from advices received from the Agent-General and Major-General Harding Stewart, R.E., that it is all in favour of a better weapon being procured, as, although the pattern has been finally decided upon, several minor alterations and improvements are being effected which will eventuate in a more perfect weapon being obtained than at present would be possible.

It has been suggested that, to save time, the new rifles might be procured through private firms; but this is a course which I do not think should be adopted, past experience having been by no means favourable to the experiment. Although the time which occasionally elapses before the War Office can comply with our requisitions is not seldom vexatious, yet when the stores do arrive they are, as a rule, of patterns which are easy to replace, and, from the supervision exercised, of a quality which cannot be impeached.

Cadets.—The strength of this portion of the Force on the 31st December, 1889, shows a slight decrease (103) since last year, but it is satisfactory to report that out of forty-one corps no less than thirty-three were favourably reported upon by officers in command of districts, and drew the grant, varying according to their efficiency, as provided for by the regulations.

I recommended in my report of last year that greater attention should be paid to the military training of the youth of the colony, and I trust that the consideration which this subject merits will be ere long accorded to it.

In conclusion, I may state that in this report I have merely touched upon matters which more or less have come under my own personal supervision or knowledge, and have left Lieut.-Colonel Hume, in his capacity of Inspector of the Volunteer Force, to deal with the particular or individual merits of officers, men, and corps.

I have, &c.,

C. A. HUMFREY,

Colonel, and Under-Secretary Defence.

The Hon. the Defence Minister.

The INSPECTOR of VOLUNTEERS to the Hon. the DEFENCE MINISTER.

SIR,—

Defence Office, Wellington, 4th June, 1890.

I have the honour to forward, for the information of His Excellency the Governor and Commander-in-Chief of the Forces in New Zealand, my second annual report on the inspections of the Volunteer Forces made by me during the year ended the 31st March, 1890.

2. *Inspections at Four Centres.*—As Major-General J. B. Edwards, C.B., R.E., with whom I acted as Staff Officer, has forwarded a full and valuable report of what, in his opinion, the organization, strength, and equipment of the Forces at the four centres should be, I feel I need say very little regarding the inspections there. As many country corps, and those at the smaller towns, have been seen as the time at my disposal permitted; but I have not noticed any marked changes which would warrant me in altering the opinion expressed in my last report as to the fitness and qualifications of the officers and non-commissioned officers for their several duties.

3. *Officers.*—The officers, as a rule, seem to be entirely deficient in that control and influence over those under their command, the absence of which must prove disastrous on active service. They are uncertain and nervous when issuing orders they feel may not be entirely palatable to their rank and file; and many are absolutely afraid to inflict fines on their men, as provided for in the regulations, and, consequently, efficiency suffers. Those under their commands are, of course, not slow in discerning these weaknesses, and the result is often too apparent. Again, when called out to drill their companies, many of the officers know neither what to do or what words of command to give, unless the staff drill-instructor is close at hand to prompt them; and in the absence of such assistance, if any movements are executed, they are usually aimless, and too often quite at variance with the instructions in the drill-book. It is quite the exception nowadays, in the Imperial or any foreign army, to see field movements done at anything but the double, but in the colony the movements, after considerable delay in getting markers into their places, &c., are invariably carried out only in quick time, and a movement at the double, if ever contemplated, is rarely ever given effect to. Officers appear to consider that so long as they attend the stipulated number of parades required to earn capitation, and keep their company books and returns as laid down by regulations, they are thoroughly efficient, and should not be expected to be competent to drill their men on parade, regarding that duty as the business of the permanent instructors. It appears to me that there must be something radically wrong in the system of examining these officers, and that sufficient trouble cannot be taken by local Boards in seeing the practical part of the tests vigorously carried out. The theoretical part, no matter how well supervised, cannot give any good results unless the practical side of the examination is of a really searching nature. I can only reiterate what I said last year, and I am glad to find Major-General Edwards laying considerable stress on the point in his report—viz., that the system of allowing the men to elect their officers is the greatest evil in our Volunteer system. I have debated this question with many Volunteers, who admit that the election system has no charms for them; and they desire to see it abolished as unsuitable to our requirements, and the nominated system take its place. They frankly admit that many of their selections have proved gross failures, the officers having been anything but a credit to the corps.

4. *Non-commissioned Officers.*—The non-commissioned officers show a slight improvement generally during the past year. They do not, however, realise to any appreciable extent the necessity when on duty of maintaining their positions, and gaining from those over whom they are placed the confidence, respect, and obedience their stripes demand. The power to command, which is so essential to their positions as non-commissioned officers, is entirely lost by their desire to shield the shortcomings of their subordinates; and discipline is much weakened by their ignorance in drill, military customs, and procedure. In late years far greater responsibilities both in drill and interior economy have been thrown on the non-commissioned officers, rendering it the more obligatory that they should be thoroughly conversant with drill in all its branches, as well as qualified to command, instruct, and correct.

5. *Rank and File.*—Though there has been a small decrease in the numbers of rank and file during the past year, yet the popularity of the Force appears little diminished, and the recruits enrolled are, as a rule, up to the average, except, perhaps, in some of the city corps, where sufficient attention has not been paid to the chest-measurement required by the regulations; but, generally speaking, the men are all that can be desired for making a really efficient Force, provided always that reliable and competent officers and non-commissioned officers are placed over them. The superior physique of the country corps is very marked, and the men composing these corps are capable of performing a day's real hard work, and are unlikely to suffer from exposure either to heat or cold, either of which might probably tell on their comrades from the cities. It would undoubtedly be a short-sighted policy to disband the country corps, or those stationed in the smaller towns; but a system of organization should be introduced which would enable these corps to be drafted in cases of necessity into the four centres with the utmost practicable speed, as they must prove a most valuable augmentation to the town corps. The fact of their being grounded in the rudiments of musketry, and of squad and company drill, would enable them to act on the defensive with the town corps in the shortest possible time; in fact, at the present moment, some country corps could hold their own in drill with any city corps. On the other hand, there are un-

doubtedly country corps that are perfectly useless, on account of the isolation of their headquarters, and all such should be compelled to turn into rifle-clubs. These rifle-clubs should be encouraged in every possible way by the department; and, to insure proper and uniform instruction in the rudiments of musketry, the shooting should, wherever practicable, be superintended by a member of the district staff.

6. *Equipment*.—I am glad to be able to report a marked improvement in the equipment generally, and many corps have supplied themselves with greatcoats during the year, the want of which has been much felt on different occasions. The time has now arrived when all corps should be compelled to equip themselves with a serviceable undress uniform, boots, greatcoats, leggings, haversacks, and water-bottles. Many of the boots now worn on parade are quite unserviceable for a long march or for swampy ground. As soon as the Lee-Mitford rifles are issued, a conclusion should be come to as to what pouch-accommodation will be required, and the corps provided as soon as possible with this the most important of accoutrements. It will be probably found that less pouch-accommodation will be necessary than has heretofore been in use.

7. *Medical Officers*.—Several medical officers were absent from the inspection parades, and, in many instances, the absence was probably due to their having no uniform to appear in on parade. If the matter is looked into, and Officers Commanding Districts called upon to furnish particulars, it will be found that some surgeons, though they have held commissions for years, have never provided themselves with uniforms, attended a parade, or performed any duty, good, bad, or indifferent. These gentlemen's names should not be retained on the rolls of their corps. Others, it is satisfactory to find, have attended parades regularly, and taken considerable pains in instructing their men in ambulance duty; but they complain that their efforts are not recognised as they should be by the department, nor can they obtain the necessary materials and appliances for carrying their instruction to a serviceable point.

8. *Battalions*.—That battalions will sooner or later form part of the organization, at the four centres at least, is beyond a doubt, but they must be built upon a very different structure from those recently disbanded. Each corps composing a battalion must sink entirely its individuality, and become one of the companies of the regiment, irrespective of who is in command, or who or what the company's officers may be. Promotions must go through the battalion not by companies, and enrolments must be for the battalion only. Each company must have its proper compliment of signallers; and a thoroughly-trained and efficient ambulance corps, with the necessary equipment, should be formed from the bandsmen of the battalion.

9. *Capitation*.—The system of giving the same amount of capitation to all branches of the service appears to be unfair towards the mounted branches and Artillery, who have to meet numerous expenses not incurred by the Infantry, and the former should therefore be more liberally treated in the matter of capitation than the latter. The £2 per head given last year was an increase on the former year, but is insufficient for corps that conscientiously carry out the regulations as regards drill and equipment. There are corps, however, whose object appears to be to do as little as possible towards efficiency and equipment, merely seeking to obtain capitation either by fair means or foul. It will be readily admitted that £2 per head per annum is insufficient to keep a corps of proper strength fully equipped; but, in reference to some corps, the question may be asked, What return do the Government get for its outlay of £2 per head? And the honest reply should often be, Nothing but inefficiency, and a paper corps in reality non-existent. I must repeat what I said last year, and what, I am proud to say, Major-General Edwards fully confirms—viz., that what we in New Zealand require is a "partially-paid" Force, whereby the Volunteer is converted into a military citizen, and each individual is placed under contract to render certain services in return for a certain pecuniary solatium, receiving pay in exact proportion to the rank attained and the service rendered. Volunteering rises and falls spasmodically. No doubt if there was a war-scare again we should see large numbers flocking to the ranks, even under present regulations and circumstances, to evade Militia duty; but as soon as the war-clouds cleared away so would the martial ardour, and there would never be a lasting efficient Force capable of defending the colony. The partially-paid system, if only extended to the number of Volunteers actually required on a peace footing, and thereby establishing the nucleus of a system capable of expansion to a war footing on the shortest possible notice, would, while proving little more expensive than our present Volunteer organization, be thoroughly efficient as far as it went. Officers are required who are not, by reason of their election, under an obligation to the rank and file, but those who are considered by persons best able to judge likely to win respect and obedience, and who have shown some adaptability to command and to enforce and maintain discipline.

10. *Arms and Accoutrements*.—The guns and carriages on issue to the field batteries of artillery are about worn out, and should be replaced by light field-guns of modern type. The rifles and accoutrements on issue to the corps are well kept and serviceable, but a Magazine rifle is much needed to keep pace with the present army infantry equipment. No time, as yet, in this matter, however, appears to have been wasted, as, if the order sent some time since for Martini-Henry rifles had been complied with, the colony would now have been saddled with a number of arms quite unsuitable for the Volunteers. Magazine rifles, it is well known, are the weapons adopted by common consent of all European nations as the infantry arm of the present day. There are numberless different patterns, and the one adopted in the English army is the Lee-Mitford, which is said to carry reduction of calibre to an extreme point, and to enable the soldier to fire from six to nine shots at a critical moment without reloading. Reduction of calibre permits of an increased effective range, and allows of the Volunteer carrying a larger number of rounds. This alone is a substantial gain; and it is probable that the difficult question of how to supply ammunition in the field has been practically solved by the adoption of the small-bore rifle. It appears to me that one of the most important points to be looked to at the present time is to obtain suitable ground for rifle-ranges in the vicinity of the towns. When it is remembered that

the new rifle sighted up to 2,800 yards for ordinary black powder with a smokeless nitro compound would carry 3,500 yards some idea may be formed of the extent of rifle-ranges that will be required in the immediate future. Great care must be exercised in training officers, non-commissioned officers, and men in order that full value may be got out of the new arm; and, further, we must educate our Volunteers to the intelligent use of the rifle under all the conditions of modern warfare. It is hoped that a short time will see the whole of the Forces armed with the Lee-Mitford rifles. Every improvement in weapons demands a yet greater improvement in training, which must be of a thoroughly practical kind, and not of the sort that has hitherto, in too many cases, furnished merely pretty tabular statements of perfunctory and useless averages.

11. *Shooting*.—It is satisfactory to be able to report that there is again, on the whole, a decided improvement in the shooting this last year, notwithstanding that the arms in use are getting annually worse and worse from wear-and-tear. The Auckland ammunition, manufactured by Messrs. Whitney and Co., is giving more satisfaction and becoming more popular than formerly. I have witnessed a good many experiments with this colonial ammunition, and have no hesitation in pronouncing it better than much of what was imported and until recently on issue in this colony. The Whitney ammunition appears to make greater penetration with less fouling and more equal shooting than the imported ammunition. I am inclined to think that a certain amount of harm to musketry, and certainly to discipline, accrues from the New Zealand Rifle Association meetings as now carried out each year. Last year the Martini-Henry rifles were used, a weapon that will never be adopted in this colony, and will soon be obsolete with the European portion of the Imperial army; and teaching our Volunteers the use of it cannot possibly benefit the service, while the expense even for its use at this annual meeting is considerable, and adds one more to the already too miscellaneous stock of arms and ammunition in use in the colony. A novel and most undesirable practice was introduced at the Association meeting last year of allowing Volunteers to shoot in plain clothes should they desire to do so. This, with the unseemly disputes that took place between officers in the sight and hearing of the rank and file, were subversive of discipline, and anything but reputable to all concerned. It is noticeable at Easter encampments that the most slovenly men are those that have a short time previously been attending the Association meeting; and if reproved for such faults as not saluting or being dressed partly in uniform and partly in mufti their reply invariably is, "We were allowed to do so at the shooting camp." It is a popular delusion to suppose that the Association meetings tend to bring recruits to the Force. This is not the case. The pot-hunter—a very undesirable class of Volunteer—may join for the purpose of making money at these meetings; but directly he fails in doing so he quits the Volunteers, and merely cries down their credit whenever he gets a chance of doing so. The week's or fortnight's camp at the Wimbledon meetings does the attendants an immense amount of good, and is as serviceable to them as a week's training at Aldershot or elsewhere, strict discipline being fully maintained; and if the annual meeting is to be continued in New Zealand the Government should insist upon nominating the discipline officers, and the Association be made to carry out their shooting-programme with their own officers, under the immediate command of the Government nominees.

12. *Inspections during Year*.—As previously stated, the inspections at the four centres were made by Major-General J. B. Edwards, C.B., R.E., those at Auckland and Wellington being night inspections in the drill-sheds, while those at Christchurch and Dunedin were early in the morning and a Saturday afternoon respectively. In Auckland the Major-General made a daylight inspection of the South Frankland Mounted Rifles, under the command of Captain Harris, in the grounds adjoining Government House, when 41 of all ranks were present out of a total strength of 61. The troop was well turned out, and executed various movements to the satisfaction of the Inspecting Officer, who complimented Captain Harrison on the horses, and general appearance of the corps. At Christchurch, after the usual salute and march past, a few brigade movements, including the attack formation, were practised. The Canterbury Mounted Rifles, under Captain Reese, with a total of 35 of all ranks, showed a marked improvement since the previous inspection, their skirmishing being particularly steady, and eliciting praise from the Major-General. The E Battery, under Captain Martin, with a strength of 41 of all ranks, and four guns horsed, looked particularly smart, and drilled very steadily. The Richmond Rifles, under Captain Bowron, had a total strength of 87 men on parade; while the Kaiapoi Rifles, under Lieutenant Wilson, had a total strength of 71 on parade. The four companies of the Christchurch Queen's Cadets, with their drum-and-fife band, were present at the parade with the adult corps; and I am glad to be able to report that these companies have made good progress in drill and efficiency during the past year; there were, however, a large number of the boys absent, the muster being only a total of all ranks of 166 out of a strength of 302. The Christ College Cadets and Christchurch High School Cadets were, I am sorry to say, for some unexplained reason, absent from this general parade; but I took an opportunity of inspecting them on a later date, and was pleased to find considerable improvement in both corps. After the general parade the Major-General was pleased to express himself satisfied with what he had seen, but made severe comments on the large number of absentees. At Dunedin, in the early morning, Major-General Edwards inspected the Dunedin Hussars, and the North Otago Hussars from Oamaru, on the Forbury Racecourse, the two corps being under canvas at the time in Tahuna Park for their annual week's training. The Inspecting Officer was much struck with the superior class of horses in the ranks of both these troops, as well as with the general appearance and physique of the men, and was pleased to express himself well pleased with their riding and drill. The absentees from the two troops amounted to 25 in all. I may here mention that the colony is fortunate in possessing such a competent and painstaking Cavalry Instructor as Captain Coleman, who by his tact, zeal, and ability makes the annual week's training a reality instead of a sham. In the afternoon the whole of the troops composing the Otago District were inspected on the Forbury Racecourse, and, after the usual salute and march past, were put through several brigade movements, including the attack formation, by Lieut.-Colonel Wales. This latter movement was anything but well executed; but the presence of so many country corps, who had

never seen it before, to a great extent accounts for some of the mistakes. The Inspecting Officer was specially pleased with the B Battery of Artillery, which, under Captain Proudfoot, manœuvred separately in a very creditable manner. The Inspecting Officer was also pleased with the three batteries of Naval Artillery present. Here, as at Christchurch, the Major-General remarked on the large number of absentees.

13. *Musters*.—The absentees at the four centres were as follows:—

			Absentees.	Strength.	Percentage.
Auckland	...	...	295	923	31·9
Wellington	...	...	74	501	14·7
Christchurch	...	...	298	952	31·3
Dunedin	...	...	384	1,200	32·0

The large number of absentees is not creditable to corps, as sufficiently long notices of the inspections had been given and Commanding Officers informed that these were special inspections made at the request of His Royal Highness the Commander-in-Chief by an Imperial General Officer specially selected and detailed for this duty.

14. *Inspections of Individual Corps*.—The corps inspected individually by me during the past year were the Marlborough Hussars, the Bluff and Lyttelton Naval Artillery, the G E and M Batteries Artillery, Blenheim Rifles, Blenheim City Rifles, Arrowtown Rifles, Cromwell Rifles, Whangarei Rifles, Wairoa Rifles, Riverton Rifles, Invercargill City Guards, Gore Rifles, Riversdale Rifles, Masterton Rifles, and Papawai Native Rifles. Cadets: Blenheim, Queenstown, Wellington College, Dunedin High School, Lawrence High School, Outram, Weatherstone, Christ College, Christchurch High School, Arrow, Cromwell, Palmerston South High School, Wanganui Collegiate School.

15. *Corps specially worthy of Mention*.—I was glad, during my stay in Christchurch, to be able to make a special inspection of the E Battery of Artillery, which has gained for itself the reputation of being a particularly smart corps. This battery annually, on the 16th December, which is a general holiday in Canterbury, makes a point of going into the country for the purpose of firing shot and shell, and practising battery and company drill; and Captain Martin was pleased to express a wish that they should be inspected on that day, in the country. I saw the battery in marching order before starting in the drill-shed yard, and minutely inspected the guns, limbers, &c., which were scrupulously clean and in excellent order; and the whole battery looked thoroughly soldierlike and serviceable. I afterwards saw them at Tai Tapu, about nine miles from Christchurch, at shot-and-shell practice, small-arms, company and battery drills, sword-exercise, technical catechising, volley and independent firing with service ammunition, and tracing out gun-pits and epaulements. The whole of these were well done, under the command of Captain Martin, ably assisted by Lieutenant Jackson. The latter officer made a very creditable reconnaissance report, accompanied by a military sketch of the road from Christchurch to Tai Tapu, in a very short time, without any previous knowledge that such a report would be called for. At shot-and-shell practice, at from 800 to 1,200 yards, out of sixty-one shots at natural objects only three were non-effective. In this corps the colony possesses a thoroughly serviceable, well-disciplined, and ably-commanded battery, which would, undoubtedly, render a good account of itself if called on active service. The G Battery at Invercargill, under command of Captain Evans, deserve special mention for their smartness in mounting and dismounting ordnance drill, and for their general appearance on parade. The Blenheim Rifles and Blenheim City Rifles are deserving of special mention for their good musters, clean appearance, and general steadiness on parade, as well as for the way in which the officers and non-commissioned officers drilled the companies. As these two companies never have the advantage of the services of a permanent drill-instructor to assist them, their knowledge of drill is the more creditable to all concerned. The Blenheim Hussars are also a well-horsed and useful corps. The Riversdale Rifles is another corps with which I was much pleased. Though inspected at a very busy time of year for the farmers, the corps mustered 53 of all ranks on parade, and went through the various movements in company drill, skirmishing, &c., under their three officers, to my entire satisfaction. The noticeable features in this corps are their splendid physique, good discipline, and *esprit de corps*. I consider them second to none in the colony, and Captain Donald and his officers may well be proud of their command. The musters of the corps in the Lake district were wretched, and the ignorance of drill evinced by all compelled me to recommend their conversion into rifle-clubs. It appears a farce that a battery of Artillery should ever have been allowed to exist in such an isolated and inaccessible place as Queenstown. At the hours and places named for the inspection of the Hampden and Otepopo Rifles there were no musters, and consequently no inspections. Of the cadets inspected, I must place first in order the Wanganui Collegiate School Cadets, and next the Wellington College and the Canterbury High School. The manual exercise, when marking time, performed by the Wanganui boys showed that considerable pains had been taken in their instruction, and was extremely creditable; while the Wellington College and the Canterbury High School boys were conspicuous for their steadiness in skirmishing. There is a marked improvement generally in the drill of cadet corps during the past year.

16. *Corps not inspected*.—The corps not inspected last year were:—Naval Artillery: Thames, Wanganui, Nelson, Oamaru, Timaru, Napier, Greymouth, and Westport. Cavalry: Canterbury Yeomanry, Waiuku, Alexandra, Te Awamutu, Wairoa, Rangitikei, and East Coast Hussars. Artillery: C, F, H, and I Batteries. Rifles: Oamaru, Rangitikei Royal, Westland, Temuka, Hampden (no muster), Wanganui, Nelson, Otepopo (no muster), Stoke, Taranaki, Napier, Palmerston North, Waimea, Manchester, Wanganui City, Ashburton, Kumara, Greymouth, Canterbury Honorary Reserve, Geraldine, Timaru, Waimate, Hawera, Mangahua, Brunner, and Hastings.

17. *Conclusion.*—In conclusion, I may state that it has been a source of pleasure to me to have been associated with the Volunteers for the past two years. The advice I have given and the suggestions I have been able to offer have always been cordially received and acted upon, and my relations with the Forces have been of a most harmonious character. The recent visit of Major-General Edwards has, however, brought prominently forward the views which I believe to be held by all competent military critics—viz., that the time has now arrived when the New Zealand Volunteers should be placed under the command of an officer still serving in the army, who will be able to devote his whole time to their training and organization. The result of my experience has fully confirmed my convictions that what is wanted is a modern scientific soldier, who after a limited period of service in the colony—say, five years—would rejoin his regiment, and be replaced by another Imperial officer of similar standing, by which means New Zealand would secure a succession of commanders always abreast of the latest military developments. Under such an arrangement an Inspector of Volunteers would no longer be required, and, though I should regret to sever my connection with the Volunteers, I feel very strongly that some such step as I have mentioned above must be taken if we wish to place our military organization on a proper basis.

I have, &c.

A. HUME,

Lieut.-Col. and A.A. Gen. N.Z.M., Inspector of Volunteers.

The ENGINEER for DEFENCES to the UNDER-SECRETARY for DEFENCE.

SIR,—

New Zealand Defences Office, Wellington, 30th May, 1890.

I have the honour to forward the usual report upon the harbour-defences of the colony for the year ending 31st March, 1890.

Temporary Prisons.

There has not been any material new departure in regard to defence-works during the past year. The occupation by the prisoners of the converted submarine-mining buildings on Ripa Island completed the establishment of four temporary prisons—the converted barracks at Fort Cautley, Auckland; Point Halswell, Wellington; and Taiaroa Head, Port Chalmers, having been already proclaimed and occupied. The much better work which has been done on Ripa Island since the permanent-location system was brought into operation, as compared with that executed when the prisoners had to be taken to and fro every day in the steam-launch, both justifies and confirms its earlier adoption at the other ports. The temporary prisons have proved equal to the needs of the department; there has been no serious attempt to break out, those confined in them recognising that, although the buildings are denominated temporary prisons, they have been sufficiently carefully strengthened and barred to render any such attempt very unlikely to result in success. The prisoners also appear healthy, and, if the context will admit the expression, contented.

Convict Labour.

With regard to the average value of convict-labour, it was pointed out in last year's report that, although it is well known by experience such labour will not stand comparison with ordinary or contract-labour as regards the amount of work executed in a given time, yet the economy of its employment compensates for the lesser results where rapidity is not essential. It may be added that, although rapidity is the essence of field-fortification, in permanent fortification it is rarely feasible, and more rarely advisable, owing to the peculiar exigencies of the work. This favourably discounts the apparent principal drawback of convict-labour. As compared with ordinary picked labour, there is a further disadvantage that the *personnel* of the gangs is most varied, ranging through all grades from the gentleman to the boy-thief, and from the herculean navy to the slim clerk, so that an even gauge of work can hardly be expected from such diverse capabilities. Here, again, however, the many varieties of work which the execution of a fortification demands enable all, under judicious arrangement and supervision, to be usefully employed. It may be—and, indeed, often is—urged that a prisoner has no interest to work hard, and consequently never does an honest hour's labour. This is no doubt largely the case where the work is that of the roads—or the chain-gang. An improved spirit, however, appears to reign on the defence-works, and perhaps no better explanation can be advanced than stated in last year's report, as follows: "The better class of prisoners is selected for transfer to the temporary prisons and employment on the works; they are housed in buildings which, while secure, are not suggestive of a gaol, and they have an always-bracing atmosphere around them. Moreover, they have not to march through the streets to and from a city gaol every day, nor are they when at work exposed to curious eyes; while the nature of the work upon which they are engaged has a definite interest and object to them, and is not merely a monotonous medium for the enforcement of hard-labour. All these considerations combine to induce them to work with greater willingness than is customary with convicts, and in many cases to display an unusual and intelligent interest in the execution of the tasks set to them." The experience of another year confirms these views. To the casual visitor to the scene of these prisoners' labour the usual gaol stroke may suggest itself as not conspicuous by its absence; but the amount and quality of the work accomplished in a given time is a better test. Of this, visits of inspection to all works throughout the colony, undertaken as often as the exigencies of a central control extending from Auckland to Dunedin, and of other duties, will admit, enable a good judgment to be formed. And it should be added that these conditions are in a very large measure due to the characters and qualities of the Inspectors of Works at the different ports, who have carried the energy and ability which they have always applied to the management of the works proper into the more difficult field of managing the convicts—so as to get ready and willing work out of them—with intelligence and judgment, and correspondingly good results. In this they receive every assistance from the warders; but it is hardly remarkable that the convicts will work, other things being equal, more readily for the plain-clothes Inspector than for their uniformed official overseers.

On the whole, therefore, the experiment of employing prison-labour upon the defence-works may be said to be well justified by the results; and it has been thought advisable, having the sufficient experience of two years, and the power of comparison afforded by former knowledge of prison-labour elsewhere, to somewhat fully enter into the subject. The cordial co-operation of the Inspector of Prisons and of the gaolers in furthering and assisting the arrangements for the useful employment of the prisoners should be acknowledged.

From the point of view of economy, the more substantial arguments of figures are also in favour of prison-labour. Taken all the year over, the average number of convicts employed on the defence-works may be stated, in round numbers, as two hundred, distributed at the four ports of Auckland, Wellington, Lyttelton, and Dunedin. They are engaged upon difficult and, in some respects, complex works, requiring a much larger amount of material and labour than would ever be suspected or, perhaps, believed to be contained in them by any one not connected with their actual construction, inasmuch as they are mostly buried in the ground. Nevertheless, a vote of £10,000 has proved more than sufficient during the past year to keep these two hundred men working longer hours than free men, and all the year round without any holidays but three, fully employed in the production of a large amount of solid and substantial work. This, which to any one practically acquainted with works must seem rather striking, is due in large measure, of course, to the absence of pay-sheets; but it is also attributable in equally large measure to the general economy of the system strictly followed as regards material. That system is to obtain all the materials of construction as far as possible *in situ*, when the locality or vicinity of the works contain them in sufficiently good quality. The prisoners have to quarry, dress, and break their own stone, and collect their own sand, gravel, or scoria, for masonry and concrete; attend the hauling engines, and appliances; load and unload the steam-launches; and in every other way make the works, so to speak, as far as possible self-supporting. Purchases of material are therefore confined principally to bricks, cement, lime, iron, and general tradesmen's goods; these, of course, have to be obtained from merchants; but although they are necessarily required in somewhat large quantities to properly equip the works, the outlay is very much less than if the heavy bulk material had also to be paid for. The prison-list also, as a rule, provides sufficient skilled as well as general labour; and it is only rarely, and for short periods or for special exigencies, that any extra free artisan has to be employed. The paid staff consists of the Inspector of Works, two to three instructing tradesmen-warders, and one to two general hands to perform such functions as keeping stores, driving carts, &c., for which a prisoner is not admissible. Under this system, the careful management of the Inspectors and the central control of the head office, £12,780 was spent in 1888-89 and only £9,194 during the past year on the construction of the defence-works of the whole colony. In the three previous years the amount so spent ranged from £25,000 to £74,000, with a not very much greater amount of work in hand—but under a system of free labour and wages, and of payment for all bulk material as well as tradesmen's goods, and upon more costly though not more serviceable designs of work.

Designs of Works.

With regard to the designs for works undertaken during the year, which have chiefly been in connection with the emplacement of the guns and equipment of the batteries for the heavy B.L. ordnance, it may be stated that they have all been, as far as possible, examined, and generally approved by General Schaw, R.E., whose invaluable advice is still freely and kindly given to this department. The typical design of battery for the 8in. 13-ton guns, of which several were required, was by him, after his own approval, referred to the department of the Inspector-General of Fortifications, Imperial War Office, and returned without any alteration of moment. It appears advisable to mention this, seeing so much important work and outlay is being and requires to be devoted to such batteries, in order to show that due care is taken to establish the general designing upon competently approved lines. These may be said to be generally embodied in the following paragraph from last year's report: "While it is at once advisable and necessary that gun-pits and magazines, and such other bomb-proof accommodation as may be required for the protection of artillery-stores and the shelter of the garrison, should be solidly constructed in concrete, masonry, or brick, it is equally essential that as little as possible of this class of work should be in any way exposed or even visible, and that the retaining-walls and other massive outlines, and the enclosed and walled spaces, as well as the neatly-formed and trimmed counterslopes and merlons of recent systems, should be conspicuous by their absence. The realisation in actual execution of these principles, while maintaining convenient communications and providing a musketry-defence of the position, is more difficult than would at first sight appear; but every effort has been made to apply them as well as the nature of the sites would allow. The shores of our harbours are singularly devoid of the extended area of fairly even-lying ground required for a fort or battery of this modern type, and their impracticable nature has occasioned a very great amount of difficulty in laying out works. General Schaw has called frequent attention to this point; and it is one that it is only right should be made clear. A further result of the application of the above principles is this: that a completed battery is buried under a mound of superincumbent earth of rough and irregular outline, evenly-trimmed and dressed slopes having been by modern experience found to be as gratifying to the eyes of the gunners of hostile vessels by enabling them to lay their fire accurately on the sharp and defined lines and shadows as to those of the old school of military engineers eager for perfect neatness of outline. Hence to the casual visitor no proportionate indication is given of the work executed and thus concealed underground; nor is it possible, even when the subterranean galleries and magazines, &c., are entered, to comprehend in the artificial light their extent and solidity. Such is or will be the appearance of all of the more recently undertaken works, both those that are completed and those that are approaching completion or are in progress."

Progress of Year in Land Works.

In advancing the preceding arguments and facts, it will be gathered by implication that a considerable degree of progress has been made with the defence-works during the past year; and, as a matter of fact, the capability of artillery resistance to attack at each port has been effectively increased. There are, however, obvious reasons why, in a report upon the defence-works which may be made public, it is inadvisable to deal except in generalities, and I am therefore debarred from more particularly alluding to the batteries and other works upon which operations have been concentrated, a bar which also prevents the mention of many interesting details.

General Edwards's Inspection.

Before leaving the general subject of the works constructed or under construction allusion may be permitted to the visit of Major-General Edwards, C.B., R.E., to the colony, and to the impression which was made upon the mind of so able and experienced an officer by these works. I had the honour to accompany him during his visit upon inspections of all works at the four ports, and to be made aware of the opinions which he entertained upon them, and very impartially and critically expressed; and the subsequent remarks upon defence-works embodied in the valuable report which he submitted to the Government are, at all events, not in the direction of condemnation.

Land Works uncommenced.

Although much has been accomplished up to the present date towards the realisation of the complete scheme as laid down from time to time by the military advisers of the Government, there still remains much to do to bring both the land and submarine defences to the necessary degree of completeness and efficiency. There are several batteries of the first importance, the armament for which is available, but for which ground has not been broken, and which call seriously for attention. It is not feasible to undertake these batteries, situate chiefly at more or less distant outposts from the centre of defence, with prison-labour, this being only utilisable within a certain radius of the temporary prisons. Their construction should therefore be by free day- and piece-labour under the department, by schedule of rates, or by ordinary lump contract. Of these three methods, the second is recommended as, on the whole, most likely under the circumstances to prove satisfactory, for many reasons. It is also the method which the experience of the Royal Engineers, as laid down in their professional and occasional papers, appears to approve. If, however, the Prisons Department could venture to allow the convicts to work at these remote places, it would be possibly best to go to the expense of erecting buildings which would serve in the future for barracks for the men who in the time of war would require to be quartered at hand, and in the present as sufficiently large auxiliary temporary prisons; and thus to continue the system of prison-labour. The conditions of only one of the sites of the batteries now referred to would admit of a prison-hulk being anchored in the vicinity; and this method of confinement, always inadvisable, would probably in the end be more expensive than barrack building. At present there are no funds made available to the construction department for these very necessary works. They form, however, as already stated last year, essential and integral and, in one or two cases, most important parts of the defences, and it will be necessary to keep them earnestly in view, and to provide in the best considered and most economical manner for their early execution, if the complete scheme of defence is to be carried out to its legitimate conclusion.

Armament for future consideration.

Although artillery questions proper do not come within my province, it is impossible for any one connected with works of defence not to take an interest in the rapid development and strides which are now made in the science of gunnery. In addition to high-angle-fire guns, quick-firing guns of much heavier calibre than were thought possible a year or two ago are now ranked as proved arms. The success of that very formidable weapon the dynamite-gun is practically insured. All these three classes of ordnance could find employment in our harbours as supplementary or complementary to their present armament in the many well-adapted positions which the contour of the shores afford; while almost a revolution may be effected in the practice of the artillery already mounted in the batteries when the secret of smokeless powder is introduced into the composition of heavy-gun cartridges; thus facilitating the already-proved and marvellously adaptable systems of range- and position-finding, in which electricity—as in many other branches of general defence—has enabled a degree of certainty to be obtained undreamt of a few years ago. There are many other instances of quite recent development which might be brought forward, and which are at once the delight and despair of those connected with fortifications; because in the one aspect they are capable of so vastly improving the power of defence, and in the other tend to depreciate in the light of to-day work brought up to proof in the light of yesterday. All these matters, however, resolve themselves into the usual primary factor of funds, and, as there are none available, pass beyond the region of at all events present practical attainment.

Mounting of Ordnance.

All the guns ordered from England, and their complete equipment for mounting and ammunition, had, at date of last report, been delivered in the colony. During the past year several have been mounted, and, as anticipated, without any mishap. Both the artillery and construction branches have now become so acquainted with the exigencies of transport and mounting that no trouble is experienced in taking the heaviest of the guns to any site and there mounting it when the works are ready.

Submarine Defence.

With regard to submarine defence, some further progress has been made with the depôts, which are now, as regards their sheds, appliances, and equipment, and also barrack-accommodation for the men of the corps, well on to completion. But here again it must be urged that there is still very

much to be done to attain that condition which is absolutely essential in every smallest detail for the successful carrying-out of active offensive and defensive submarine warfare. The colony has at large expense provided itself with an extensive equipment of the latest and most approved appliances, and has established an efficient Torpedo Corps to use them, who would be supplemented by trained Naval Volunteers in time of war. But to have excellent qualities both in the corps and their matériel is not in itself sufficient to command the full and proper value of those qualities, even in training, and still less in active operations. The depôts must be further developed in buildings, jetties, and working appliances, so as to provide all those station facilities the absence or shortcomings of which may seriously retard the orderly and methodical embarkation of men and material on active operations at a moment's notice. Improved sheds for the torpedo-boats are very advisable, and last but not least in the list of station-requirements comes the necessity for some of the recognised special vessels required for the carriage and laying of mines. The rapid developments of recent years in submarine work have gone far to show that the utilisation of improvised ordinary lighters, launches, or crafts for these purposes is waste of time, energy, and skill.

This brings the submarine warfare to the scene of operations, where everything must be perfectly supplied and in order—both on the adjoining land and on the water—that is required to enable the mines to be dropped to the established plan in their assigned places expeditiously and securely, and with the sure and certain hope of the speedy sinking of any hostile vessel endeavouring to cross them, while providing a safe channel for all friendly vessels: on land, the observing, testing, and firing stations, protection of the cables, permanent surveys and landmarks, casemates of the electric light engine and dynamos, and stations for the light-projectors themselves; on water, a perfect knowledge of the sea-bottom and all other marine features of the mine-field. Although so deadly in its mode of action and perfect in its scientific and electrical development, the submarine mine requires a host of accessories in unassailable order to enable it to produce its formidable effect; and incompleteness or defect in any one of these may render it harmless as a harbour-buoy. Here also comes in that co-operation of the land defences generally without which submarine work is very largely deprived of its full power of offence and defence, and of playing that important and decisive part in harbour warfare which will always in future fall to it. The guns, mines, torpedoed, and torpedo-boats must act in and form part of a combination to provide efficient protection. It is very evident, therefore, that in not one link of the whole chain should any avoidable weakness be permitted, and that one and all of the works requiring to be undertaken and completed to attain that capability of defence which the colony has aspired to must be provided for if it is to do so. Hence, notwithstanding the advanced stage already reached, it can only be repeated that there is much responsible and difficult work yet to accomplish when funds are available.

Submarine Defence Extension.

As with artillery, so with submarine mining—the strides made in advance are great and constant, and even the period that has elapsed since the colony ordered its equipment has witnessed many improvements. In locomotive torpedoes, the Whitehead, of which the colony has an equipment, still holds its own. The Brennan torpedo is now a proved success, but is, though well adapted to New Zealand harbours, a very costly weapon to install. An American torpedo bids fair to come to the front of its numerous rivals, and would, if it attains the results expected, be a desirable addition to the defences. Submarine torpedo-boats of various deadly designs have been brought into the field of practical warfare, and are now established in several navies, notwithstanding the attitude taken up as regards the first of the kind as far back as 1820, of which it is recorded: “This was a submarine boat carrying a torpedo on its back, to be fastened to the bottom of a hostile vessel. The trial proved successful, *but the English Government refused to sanction the project as being too diabolical.*” In this connection it may be mentioned that, although such boats have not been contemplated for our defences, one has been designed by a New Zealand inventor, which may prove to have sterling merits, if developed by the Imperial authorities, to whom it has been submitted.

Stores.

The whole of the valuable submarine stores and equipments in the colony are in the charge of the Torpedo Corps at the various stations, and are inspected at periodical intervals by Captain Falconer, the officer in command of the submarine mining branch, and are all kept in excellent arrangement and condition.

The steam-launches, and all other plant, gear, stores, and appliances employed in and for the general carrying-on of the defence-works, have been maintained in an efficient and satisfactory condition throughout the year.

The guns, magazines, artillery-stores, ammunition, &c., are under charge of the Permanent Artillery, and are reported on by the Staff Officer.

Maintenance of Batteries.

The completed batteries and works when handed over cease to be under my immediate charge, and are reported on by the officers of the Artillery, except as regards general maintenance or other works required, which are executed by the construction branch. One of the defective magazines referred to in last year's report has been dealt with during the summer on a new plan, involving no disturbance of the fort at all, and the leakage and dampness has been overcome by the application of the process invented by Major Moore, R.E. This having proved a successful experiment, there will not in future be any serious trouble in dealing with that great difficulty of buried works—keeping them dry without in any way disturbing their earthworks or overhead earth protection. In the best works ever constructed, dealing with the dampness or leakage that will find its way through at times is a constant item of maintenance, and recognised as inevitable. The fact should not be overlooked that there will always, and necessarily, have to be expenditure upon maintenance,

requiring to a greater or less extent skilled supervision. The very nature of coast defence batteries—with their galleries of communication, underground magazines, artillery stores, casemates, barracks, electric light installations, &c.—calls for watchful attention in this respect, as a very small evil may soon, if unattended to, become a serious one. The general upkeep of established fortifications forms a noticeable portion of the duties of Royal Engineers at all places where fortress companies of the corps are stationed.

Armament Court, Dunedin Exhibition.

Following the example of the Melbourne and other Exhibitions, a display was made in a special court at the Dunedin Exhibition of specimens of the guns, mines, and other weapons and models, &c., connected with defences, and attracted considerable attention. The electric light was also worked.

General foreign information.

Further information and suggestions connected with the perfection of the equipment and the fighting-powers of the guns in possession of the colony, and embodying also the latest ideas and results derived from experiments and trials of various guns and other means of defence in England, have been forwarded during the year by the Agent-General and General Harding-Steward, R.E.

Land Sites.

In connection with the acquisition of sites for batteries and other works, the sum of £1,500 has had to be paid for one of the Auckland sites, as referred to below. To enable the complete scheme of defence to be carried out it will be necessary to acquire some additional sites, but the expenditure involved is not in any case likely to be serious.

Expenditure.

With regard to expenditure during the year, provision for the matériel of war from England (partly in fulfilment of contracts entered into by the previous Government and partly to complete equipments), which has always been charged to loan fund, as well as certain miscellaneous charges which cannot properly be brought against the vote for prison-labour and material, was made last year by a vote out of loan fund of £6,432, being the balance of allocation, against which appears an expenditure of £7,293. The reason of this excess of £841 has been the compulsory payment in accordance with an award of the Court of over £1,500 to the Native owners for land acquired for a battery in Auckland, and for which it was thought another more valuable but not required military reserve adjoining would be accepted in exchange without the passage of money.

On the other hand, a saving of £1,541 has been made on the vote of £10,000 for the works, the expenditure having been £8,459.

The net result, therefore, is a saving of £700 on the total amount voted.

The liabilities at the 31st March were £1,850 upon matériel and miscellaneous charges, to which has to be added the deficit of £841 above mentioned, making actual liabilities £2,691 in all, which require to be covered by a small vote out of loan; and £1,418 upon works, which will merge in the current year's expenditure.

The total outstanding liabilities at the 31st March amount, therefore, to £4,109.

The values of lands acquired, owing to the exigencies of negotiations, in excess of actual requirements, and of the engines, plant, &c., on the works, amount to £12,000; this sum is an asset against the cost of the defences.

The total expenditure on harbour defences up to the 31st March, 1890, has been, in round numbers, £458,000, of which £238,000 represents cost of matériel of war from England and miscellaneous charges connected therewith, and £220,000 the cost of works in the colony. Of this latter sum about £34,000 has been paid for land, and the balance, £186,000, represents the cost of the forts, batteries, submarine defences, steam-launches, reports of Royal Engineer officers, engineering, supervision, and all other charges.

The usual return is attached to the report, giving, under some principal subdivisions in tabular form, particulars of the total expenditure upon the harbour defences of the colony, from the first steps taken up to the present date.

31st March, 1890.

ARTHUR BELL,

Engineer for Defences.

RETURN of VOLUNTEERS to the 31st December, 1889.

Table I.

District.	Corps. Cavalry.	Corps. Infantry.	Mounted Corps. Infantry.	Naval Corps. Artillery.	Corps. Artillery.	Artillery Corps.	Engi- neers.	Corps.	Rifles.	Corps.	Hono- rary.	Corps.	Total.	Corps.	Cadets.
Auckland ..	.. 1	.. 1	.. 56	2 198	2	119	1 55	7	465	..	..	..	837	..	..
Waikato ..	.. 1	.. 1	.. 56	.. ..	.. ..	.. ..	.. ..	1 1	48	..	..	..	168	..	..
Taranaki ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	62	..	..	..	107	..	..
Patea ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	61	..	..	..	61	..	..
Wanganui ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	50	..	..	..	106	..	..
Rangitikei ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	2 2	131	..	..	..	255	..	..
Wellington ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	3 3	165	..	..	..	216	..	..
Wairarapa ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	4 4	292	..	..	..	612	..	..
Napier ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	2 2	198	..	..	..	198	..	..
Poverty Bay ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	2 2	119	..	..	..	218	..	..
Thames ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	..	..	..	..	65	..	..
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	..	..	..	..	69	..	..
Total North Island ..	6	1	56	7 586	4	232	1 55	26	1,591	1	68	46	2,912	10	497
Nelson ..	.. 1	.. 1	.. ..	2 119	1	60	.. ..	3	163	..	..	..	342	2	92
Marlborough ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	2 2	128	..	..	..	188	2	110
Canterbury, North ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	9 9	671	..	..	..	1,036	4	345
Canterbury, South ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	6 6	320	..	..	..	427	3	105
Oamaru ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	6 6	336	..	..	..	531	5	294
Dunedin ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	12 12	795	..	..	..	1,244	8	591
Invercargill ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	4 4	253	..	..	..	462	..	..
Lake ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	2 2	102	..	..	..	151	3	138
Westland ..	.. 1	.. 1	.. ..	.. ..	.. ..	.. ..	.. ..	5 5	302	..	..	..	366	4	172
Total South Island ..	4	1	46	10 732	9	503	2 116	49	3,070	2	109	77	4,807	31	1,847
Total all New Zealand ..	10	2	102	17 1,318	13	735	3 171	75	4,661	3	177	123	7,719	41	2,344

Table II.

INSPECTIONS attended as STAFF OFFICER to Major-General J. B. EDWARDS, C.B., R.E.

Name of Corps.	Date of Inspection.	Present on Parade.			Absent.	Total Strength of Corps.
		Officers.	Non-commissioned Officers and Men.	Total.		
1889.						
Wellington Naval Artillery	Oct. 22	3	93	96	15	111
Petone Naval Artillery	" 22	3	77	80	13	93
D Battery Artillery	" 22	2	58	60	5	65
Wellington City Rifles	" 22	2	61	63	11	74
Wellington Guards	" 22	3	55	58	11	69
Wellington Rifles	" 22	3	47	50	14	64
Wellington Garrison Band	" 22	..	20	20	5	25
Newtown Rifles	" 22	1	36	37	26	63
South Franklin Mounted Infantry	" 16	3	38	41	20	61
Auckland Naval Artillery	" 16	2	71	73	31	104
Ponsonby Naval Artillery	" 16	2	62	64	31	95
A Battery Artillery	" 16	3	38	41	24	65
O Battery Artillery	" 16	2	38	40	14	54
Auckland Engineers	" 16	..	37	37	18	55
Auckland Victoria Rifles	" 16	3	31	34	15	49
Auckland City Guards	" 16	4	33	37	27	64
Onehunga Rifles	" 16	2	34	36	28	64
Newton (Auckland) Rifles	" 16	3	45	48	23	71
Auckland Royal Irish Rifles	" 16	3	40	43	20	63
Hamilton Light Infantry	" 16	3	56	59	10	69
Auckland Garrison Band	" 16	..	38	38	8	46
North Otago Hussars	" 26	3	33	36	16	52
Otago Hussars	" 26	3	39	42	9	51
Dunedin Naval Artillery	" 26	3	65	68	8	76
Port Chalmers Naval Artillery	" 26	1	50	51	39	90
Peninsula Naval Artillery	" 26	3	40	43	14	57
B Battery Artillery	" 26	3	43	46	10	56
L Battery Artillery	" 26	2	23	25	37	62
Dunedin Engineers	" 26	3	40	43	19	62
Dunedin City Guards	" 26	3	45	48	16	64
Bruce Rifles	" 26	3	32	35	15	50
South District Rifles	" 26	3	27	30	40	70
East Taieri Rifles	" 26	3	37	40	13	53
North Dunedin Rifles	" 26	3	45	48	18	66
Waikari Rifles	" 26	3	35	38	25	63
Waitahuna Rifles	" 26	3	35	38	12	50
Dunedin Highland Rifles	" 26	3	35	38	35	73
Dunedin Irish Rifles	" 26	3	39	42	22	64
Tuapeka Rifles	" 26	3	30	33	15	48
Kaitangata Rifles	" 26	3	43	46	14	60
West Taieri Rifles	" 26	2	31	33	17	50
Dunedin Garrison Band	" 26	..	29	29	6	35
Dunedin Ordnance Band	" 26	..	20	20	..	20
Dunedin County Band	" 26	..	25	25	7	32
Canterbury Yeomanry Cavalry	Nov. 5	2	4	6	60	66
Canterbury Mounted Rifles	" 5	3	32	35	10	45
E Battery Artillery	" 5	2	39	41	20	61
N Battery Artillery	" 5	2	23	25	35	60
Canterbury Engineers	" 5	3	40	43	9	52
Christchurch City Guards	" 5	3	56	59	16	75
Christ College Rifles	" 5	3	51	54	12	66
Christchurch Rifles	" 5	3	50	53	16	69
Sydenham Rifles	" 5	3	32	35	28	63
Canterbury Scottish Rifles	" 5	3	42	45	18	63
Richmond Rifles	" 5	1	86	87	14	101
Canterbury Irish Rifles	" 5	1	45	46	19	65
Kaiapoi Rifles	" 5	2	69	71	19	90
Rangiora Rifles	" 5	3	30	33	14	47
Christchurch Garrison Band	" 5	..	21	21	8	29
Permanent Staff	" 5	2	3	5	..	5
District Staff	" 5	4	..	4	1	5
Total .. .. .	..	143	2,472	2,615	1,075	3,690
Kaiapoi Cadets	Nov. 5	2	48	50	2	53
Queen's Cadets, No. 1 Company	" 5	1	13	14	16	30
Queen's Cadets, No. 2 Company	" 5	1	18	19	42	61
Queen's Cadets, No. 3 Company	" 5	2	33	35	35	70
Queen's Cadets, No. 4 Company	" 5	1	33	34	27	61
Queen's Band	" 5	..	14	14	14	28
Total .. .. .	..	7	159	166	136	302
Grand Total .. .. .	..	150	2,631	2,781	1,211	3,992

RETURN of ANNUAL INSPECTIONS.

Table III.

Name of Corps.	Date of Inspection.	Present on Parade.			Absent.	Total Strength of Corps.
		Officers.	Non-commissioned Officers and Men.	Total.		
1889.						
Blenheim Rifles	May 14	3	55	58	10	68
Marlborough Hussars	" 14	3	36	39	18	57
Blenheim City Rifles	" 14	2	51	53	15	68
Staff	" 14	5	..	5	1	6
Wellington Naval Artillery	Oct. 22	3	93	96	15	111
Petone Naval Artillery	" 22	3	77	80	13	93
D Battery Artillery	" 22	2	58	60	5	65
Wellington City Rifles	" 22	2	61	63	11	74
Wellington Guards.. .. .	" 22	3	55	58	11	69
Wellington Rifles	" 22	3	47	50	14	64
Wellington Garrison Band	" 22	..	20	20	5	25
Newtown Rifles	" 22	1	36	37	26	63
Heretaunga Light Horse	" 22	..	..	..	43	43
South Franklin Mounted Infantry	" 16	3	38	41	20	61
Auckland Naval Artillery	" 16	2	71	73	31	104
Ponsonby Naval Artillery	" 16	2	62	64	31	95
A Battery Artillery	" 16	3	38	41	24	65
O Battery Artillery	" 16	2	38	40	14	54
Auckland Engineers	" 16	..	37	37	18	55
Auckland Victoria Rifles	" 16	3	31	34	15	49
Auckland City Guards	" 16	4	33	37	27	64
Onchunga Rifles	" 16	2	34	36	28	64
Newton (Auckland) Rifles	" 16	3	45	48	23	71
Auckland Royal Irish Rifles	" 16	3	40	43	20	63
Hamilton Light Infantry	" 16	3	56	59	10	69
Auckland Garrison Band	" 16	..	38	38	8	46
North Otago Hussars	" 26	3	33	35	16	52
Otago Hussars	" 26	3	39	42	9	51
Dunedin Naval Artillery	" 26	3	65	68	8	76
Port Chalmers Artillery	" 26	1	50	51	39	90
Peninsula Artillery	" 26	3	40	43	14	57
B Battery Artillery	" 26	3	43	46	10	56
L Battery Artillery	" 26	2	23	25	37	62
Dunedin Engineers	" 26	3	40	43	19	62
Dunedin City Guards	" 26	3	45	48	16	64
Bruce Rifles	" 26	3	32	35	15	50
South District Rifles	" 26	3	27	30	40	70
East Taieri Rifles	" 26	3	37	40	13	53
North Dunedin Rifles	" 26	3	45	48	18	66
Waikari Rifles	" 26	3	35	38	25	63
Waitahuna Rifles	" 26	3	35	38	12	50
Dunedin Highland Rifles	" 26	3	35	38	35	73
Dunedin Irish Rifles	" 26	3	39	42	22	64
Tuapeka Rifles	" 26	3	30	33	15	48
Kaitangata Rifles	" 26	3	43	46	14	60
West Taieri Rifles	" 26	2	31	33	17	50
Dunedin Garrison Band	" 26	..	29	29	6	35
Dunedin Ordnance Band	" 26	..	20	20	..	20
Dunedin County Band	" 26	..	25	25	7	32
Canterbury Yeomanry Cavalry	Nov. 5	2	4	6	60	66
Canterbury Mounted Rifles	" 5	3	32	35	10	45
Lyttelton Naval Artillery	" 5	..	..	..	79	79
E Battery Artillery	" 5	2	39	41	20	61
N Battery Artillery	" 5	2	23	25	35	60
Canterbury Engineers	" 5	3	40	43	9	52
Christchurch City Guards	" 5	3	56	59	16	75
Christ's College Rifles	" 5	3	51	54	12	66
Christchurch Rifles	" 5	3	50	53	16	69
Sydenham Rifles	" 5	3	32	35	28	63
Canterbury Scottish Rifles	" 5	3	42	45	18	63
Richmond Rifles	" 5	1	86	87	14	101
Canterbury Irish Rifles	" 5	1	45	46	19	65
Kaiapoi Rifles	" 5	2	69	71	19	90
Rangiora Rifles	" 5	3	30	33	14	47
Christchurch Garrison Band	" 5	..	21	21	8	29
Permanent Staff	" 5	2	3	5	..	5
District Staff	" 5	4	..	4	1	5
M Battery Artillery	Dec. 7	2	15	17	32	49
Arrow Rifles	" 9	3	12	15	36	51
Cromwell Rifles	" 10	3	35	38	12	50
Lyttelton Naval Artillery	" 18	2	37	39	40	79
E Battery Artillery	" 16	2	39	41	20	61
1890.						
Wairoa Rifles	Feb. 8	2	32	34	14	48
Whangarei Rifles	" 8	3	31	34	15	49
Riverton Rifles	" 26	2	41	43	11	54
Bluff Naval Artillery	" 26	2	69	71	17	88
Invercargill City Guards	" 26	3	46	49	12	61
O Battery Artillery	" 26	1	37	38	10	48
Invercargill Garrison Band	" 26	..	20	20	..	20
Gore Rifles	" 27	2	31	33	16	49

Table III.—continued.

Name of Corps.	Date of Inspection.	Present on Parade.			Absent.	Total Strength of Corps.
		Officers.	Non-commissioned Officers and Men.	Total.		
1890.						
Riversdale Rifles	Feb. 28	3	50	53	7	60
Waikouaiti Rifles	Mar. 3	3	48	51	11	62
Naseby Rifles	" 5	3	43	46	12	58
Palmerston South Rifles	" 6	2	30	32	14	46
Masterton Rifles	" 19	3	34	37	16	53
Papawai Native Rifles	" 20	3	22	25	23	48
Total		200	3,286	3,486	1,559	5,045
1889.						
Blenheim Borough School Cadets	May 15	3	64	67	6	73
Wellington College Cadets	" 22	3	44	47	1	48
Dunedin High School Cadets	Oct. 26	2	35	37	33	70
Lawrence High School Cadets	" 26	..	22	22	36	58
Outram School Cadets	" 26	3	36	39	16	55
Weatherstone School Cadets	" 26	1	14	15	26	41
Christ's College Cadets	Nov. 5	..	..	..	51	51
Boys' High School Cadets	" 5	..	..	..	53	53
Kaipoi Cadets	" 5	2	48	50	2	52
Queen's Cadets, No. 1 Company	" 5	1	13	14	16	30
Queen's Cadets, No. 2 Company	" 5	1	18	19	42	61
Queen's Cadets, No. 3 Company	" 5	2	33	35	35	70
Queen's Cadets, No. 4 Company	" 5	1	33	34	27	61
Queen's Cadet Band	" 5	..	14	14	14	28
Queenstown Cadets	Dec. 9	1	26	27	23	50
Arrow Cadets	" 9	1	15	16	27	43
Cromwell Cadets	" 10	2	24	26	16	42
Boys' High School Cadets	" 17	2	35	37	11	48
Christ's College Cadets	" 17	3	36	39	4	43
1890.						
Palmerston South High School Cadets	Mar. 19	1	40	41	9	50
Total		29	550	579	448	1,027
Grand total		229	3,836	4,065	2,007	6,072

HARBOUR DEFENCES.

Table IV.

RETURN showing the EXPENDITURE on HARBOUR DEFENCES, in detail, from their Commencement to the 31st March, 1890, also Liabilities at that Date.

Classification.	1878-79.	1879-80.	1880-81.	1883-84.*	1884-85.	Total Expenditure up to 31st March, 1885.†	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	Total Expenditure from 31st March, 1885, up to 31st March, 1890.‡	Great Totals Expenditure from 1878 to 31st March, 1890.§	Liabilities known to exist at 31st March, 1890.	Grand Total Expenditure and Liabilities at 31st March, 1890.
I.—MATERIAL FROM ENGLAND.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
R.B.L. guns and carriages, &c. . . . .	..	..	..	..	..	..	85,149 0 0	98,033 15 7	11,188 15 8	17,770 7 9	..	102,141 19 0	102,141 19 0	..	..
R.M.L. guns and carriages, &c. . . . .	..	26,356 13 0	..	..	..	26,356 13 0	4,203 6 4	..	..	354 5 10	..	4,557 12 2	30,914 5 2	..	..
Field-guns and carriages, service pattern . . . . .	..	..	..	..	..	..	..	900 0 0	..	..	..	900 0 0	900 0 0	..	..
Machine-guns and carriages . . . . .	..	..	..	..	..	..	..	1,745 12 2	6,393 9 6	5,673 13 0	..	13,812 14 8	13,812 14 8	..	..
Ammunition	10 7 10	799 0 7	..	..	..	809 8 5	3,504 5 11	3,352 8 9	11,890 2 2	4,975 1 4	..	23,721 18 2	24,531 6 7	..	..
War Office stores: Miscellaneous equipments	4,830 0 0	..	..	..	..	4,830 0 0	..	3,975 14 7	485 18 10	120 10 0	391 14 7	4,973 18 0	9,803 18 0	..	..
Major-General Stewart, R.E., Military Adviser to Agent-General . . . . .	..	..	..	..	..	..	513 13 6	1,986 10 8	522 17 4	344 6 0	330 8 2	3,697 15 8	3,697 15 8	..	..
Torpedo-boats . . . . .	..	..	..	6,300 0 0	4,735 17 0	11,035 17 0	..	..	..	..	..	..	11,035 17 0	..	..
Whitehead torpedoes and air-compressing machinery . . . . .	..	..	..	..	..	..	8,104 0 8	685 0 0	..	374 7 7	4 8 4	9,167 16 7	9,167 16 7	..	..
Submarine mining stores for submarine defence of ports . . . . .	..	..	..	..	..	..	..	872 13 6	12,055 6 6	2,096 4 5	3,259 19 6	18,284 3 11	18,284 3 11	..	..
Miscellaneous charges: Freight, insurance, shipping, &c.	857 0 4	415 11 1	..	..	2,226 13 10	3,499 5 3	338 19 7	2,026 11 2	3,539 0 11	3,370 7 9	899 17 1	10,174 16 6	13,674 1 9	..	..
Totals	5,697 8 2	27,571 4 8	..	6,300 0 0	6,962 10 10	46,531 3 8	51,813 6 0	53,578 6 5	46,075 10 11	35,079 3 8	4,886 7 8	191,432 14 8	237,963 18 4	1,250 4 7	239,214 2 11
II.—WORKS IN THE COLONY.															
Defence works generally: Batteries, dépôts, launches, engineering, and miscellaneous charges	713 1 3	531 19 8	904 6 2	912 6 11	2,638 5 3	5,699 19 3	58,081 5 1	74,429 6 8	25,805 14 11	12,769 13 7	9,194 12 6	180,280 12 9	185,980 12 0	1,418 0 10	187,398 12 10
Purchases, &c., of land: Sites for dépôts and batteries . . . . .	..	..	..	..	..	..	17,272 9 0	11,421 6 2	1,577 9 8	2,240 6 0	1,671 2 9	34,182 13 7	34,182 13 7	600 0 0	34,782 13 7
Totals	713 1 3	531 19 8	904 6 2	912 6 11	2,638 5 3	5,699 19 3	75,353 14 1	85,850 12 10	27,383 4 7	15,009 19 7	10,865 15 3	214,463 6 4	220,163 5 7	2,018 0 10	222,181 6 5
Totals I. and II.	6,410 9 5	28,103 4 4	904 6 2	7,212 6 11	9,600 16 1	52,231 2 11	127,167 0 1	139,428 19 3	73,458 15 6	50,089 3 3	15,752 2 11	405,896 1 0	458,127 3 11	3,268 5 5	461,395 9 4

* There was no expenditure for the years 1881-82 and 1882-83. † At this date (31st March, 1885) the actual construction of defence works commenced. The expenditure in the colony prior to this date was—(a) For surveys and other expenses incidental to the visits of Colonel Scratchley, R.E., and Major Cautley, R.E., to report upon the defences of the colony; (b) the salaries and travelling expenses of those Imperial officers; (c) the landing, transport, storage, and care of R.M.L. guns and ammunition, and of torpedo-boats; and (d) other miscellaneous charges. ‡ This column represents the sum of the separately-shown expenditures of the two periods assigned in the two preceding notes. § This column represents the expenditure on all accounts incurred since the actual construction of the defence works commenced, namely, from 31st March, 1885, to 31st March, 1890.

31st March, 1890.

ARTHUR BELL, Engineer for Defences.

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