

"exist in perfection without a trained permanent staff, an unprofitable expenditure of public money being often the consequence of dispensing with it."

Cavalry.

I venture to doubt whether Canada could supply so large or efficient a body of cavalry as has been by some imagined, who ignore the fact that Canadians are not a nation of horse-men. Toronto, Ottawa, Montreal and Quebec are the only places where foxhounds are followed. The long, hard winter necessitates driving in a well furred sleigh rather than riding, and in summer fast-trotting sulkies are more prevalent than hacks. Nevertheless the yeoman cavalry of Ontario and along the United States frontiers of Quebec and New Brunswick have before now done good service as outposts; the eyes, ears, feelers and veil of an army.

They have able and enthusiastic cavalry leaders in such men as Colonel Dennison, of Essay celebrity, Colonels Forsyth, Turnbull, Lovelace, Saunders and others.

The country troops are of course rough in appearance compared to those of cities who have more opportunities for dismounted drills, while their saddlery and appointments are kept in better order. The rural troops from their knowledge of the country are of course better scouts.

Artillery.

The artillery is perhaps the arm in which the natural military proclivities of Canadians appear at their best. Their efficiency compared with the short period of training has been a constant source of surprise to me. The practical mobility of the field artillery of small country towns is due to its popularity among the sons of yeomen farmers who enrol their own pair of horses and enlist as drivers. Their first appearance would perhaps be painful to the hypercritical glance of a Royal Artilleryman, but familiarity would teach him that, give them time, and they will get their guns almost anywhere for you; their Officers would select good positions, and the fire, judging by their target practice, would be very fairly effective. The cities naturally produce the most intelligent gunners, as the rural districts do the best drivers. The system of selecting artillery marksmen fostered by the Dominion Artillery Association, and introduced into the Canadian Militia before it existed in England, has, I think, produced very good results. I trust I may be excused for quoting my own report which gives a *résumé* of the subject:—

Extracts from Report of the Dominion Inspector of Artillery.

"Field Artillery Generally.

"Considering the small cost to the Government, and the consequent short period allowed for training—16 days—I consider the Canadian Militia Field Artillery in a remarkable state of efficiency. I trust the number of horses will be increased to six per gun, with three spare in case of accidents, making a total of 45 horses per battery. The issue of black leather gaiters up to the knee and strapped spurs to mounted non-commissioned officers and men, though apparently a trifling matter, would tend much to efficiency; the trousers, often without straps, wrinkle up towards the knees, unsightly in appearance; they would gall the leg of a man riding any distance. The deficient and irregular supply of whips and spurs renders good driving impossible, and has been a source of accident as at Hamilton, Ont., when a gun team going up a steep incline could not be kept up to the collar, and were precipitated down a declivity, in this instance, fortunately without loss of life.

"Instead of the importation of the cumbersome ammunition wagons, I would recommend the adoption of a system of an enlarged limber supply as more handy, with fewer horses and less difficulty in driving, &c., as proposed by Major Ellis, R.A.

"The Dominion Artillery Association has, I think, by producing a spirit of emulation, been largely conducive to the present efficiency of the field artillery, while the system of efficiency badges for unpaid drills has been largely conducive of good results, especially to the artillery in cities and towns. A complete Field Battery of Instruction at each of the gunnery schools is absolutely necessary before instruction in field movements can be given."

In spite of the very able essay of Major Holmes, Adjutant of the Kingston Gunnery School, I would not recommend a large increase to the Militia field artillery, but would prefer to see what is at present organized given double the period of drill—32 days instead of 16—and a proper equipment of ammunition wagons or limbers issued. The greatly increased range and efficiency of infantry fire does not, in my opinion, point to the advisability of increasing our proportion of guns to infantry as formerly laid down in Europe. The close character of the country and the badness of roads in Canada would not, in my opinion, justify any large increase of field artillery. Better to render thoroughly efficient what we have got. Indifferent artillery or even good artillery badly handled is only an incumbrance.

It might be thought advisable to equip a few batteries with mitrailleurs, firing the same ammunition as the infantry, to act with cavalry and enable them to seize and hold an important point; but until some manufactory for small-arm ammunition is established in Canada, it would be rash to start an armament that would call for a larger reserve of what we have to import a distance of 4,000 miles, viz., small-arm ammunition.

With regard to the garrison artillery, I must again quote my own report and that of my Assistant-Inspector, Lieutenant-Colonel Price Lewes:—

"Garrison Artillery Generally.

"With the exception of the Montreal and St. John, N.B., Brigades of Garrison Artillery, I have found the garrison artillery in a very inefficient condition, mainly, I believe, for want of a weapon on the efficacy of which they can rely, as they cannot on the old smooth bores that cumber our works and drill sheds. The introduction of Sir William Palliser's comparatively inexpensive system of converting our old cannon into rifles in Canadian workshops, at a cost of 120*l.* each, the cost of the imported Palliser gun being 160*l.* exclusive of freight, is, in my opinion, the only tangible and permanent means of giving efficiency to this important branch of the service, especially in cities where both the industry, the guns, and the gunners, are most needed; and where intelligent mechanics may be found to form enthusiastic artillerymen to man the guns they forge in the defence of the city where they live. Judging by what has taken place in Great Britain, these results are not necessarily visionary for Canada. Having commanded the Gunnery School for Reserve Artillery at Woolwich, from its inception until I left for Canada, it was my duty to recommend the adoption of the Palliser 64-pounder for the Reserve Artillery of Great Britain. The immediate interest roused by this substitution (for 'the old 'gas-pipe guns,' as the obsolete weapons were somewhat irreverently styled by the men who were supposed to fight them) raised the efficiency of the force in a manner incredible to one who did not witness it. The home Reserve Artillery of Great Britain musters 60,000 fairly trained gunners in addition to the regular reserves of the Royal Artillery. I would earnestly plead for the extension of the system to this part of the Empire."

Lieutenant-Colonel Price Lewes reports:—

"I regret to find in the Halifax drill shed no stores for shifting ordnance exercises; in fact no appliances wherewith to instruct or interest the artilleryman in his work beyond a few 32-pounder smooth-bore guns mounted on traversing plat-

"forms. The Brigades of Halifax Artillery contain the material for as fine a force of garrison artillery as could be desired; but if the most ordinary appliances for instruction (which in England are possessed by the smallest volunteer artillery corps) are not given them a high state of efficiency cannot be expected. I trust this deficiency may be remedied, especially as regards Halifax and St. John, N.B., at both of which places are excellent drill sheds, and I feel confident that the results in increased efficiency will amply justify the trifling outlay required for the few stores referred to. These brigades have not carried out their annual gun practice, owing to the ammunition having only very recently been received, and I should recommend that, as the winter season has set in, the ammunition be retained until the spring, and then used for competitive practice."

In my own report I find the following:—

"Engineers.

"This branch of the Militia is sadly in want of materials, and means of instruction. They are without entrenching tools and the common appliances of their arm. Lieutenant-Colonel Scoble at Toronto, Major Kennedy at Montreal, and Captain Perley at St. John, N. B., are able and zealous Officers, anxious to produce efficiency, if the means were available.

"The two engineer companies at Montreal might with advantage be placed under the senior officer of the arm at Montreal.

"I was not notified by any of the Deputy Adjutants-General of the districts of the proposed dates of inspection of engineer corps, and have therefore had no opportunity of judging accurately, but from want of the appliances before mentioned, and from previous inspections of some of the companies, I believe them to be little more than efficient infantry. The Toronto Engineers, Lieutenant-Colonel Scoble, have to a certain extent, I am informed, supplied material at their own expense."

They are very zealous and deserve great commendation and some assistance from Government, but I am not of opinion that, considering the very small sum of money voted for the Militia, it would be advisable to horse and establish so costly an institution as a pontoon train. Especially do I not think the game worth the candle in Canada, on the banks of whose forest rivers and streams for the most part are found the means of crossing, which a gang of lumber-men would very soon knock into a bridge or raft, with extra flotation if required from empty pork, flour, petroleum, or whisky barrels, which must be found where men congregate, or at all events in the stores of an army. There is no organization for the transport and supply of ammunition in the field, a question of vital importance in these days of breech-loaders.

Wednesday, May 7, 1879.

LIEUTENANT-GENERAL SIR HENRY LEFROY, K.C.M.G., C.B., R.A., &c., &c., in the Chair.

Part III.—PERMANENTLY EMBODIED TROOPS AND MILITARY EDUCATIONAL ESTABLISHMENTS OF CANADA.

When the Imperial legions were withdrawn from Quebec, the last and most important stronghold of Canada proper, to me was confided the honour of forming a garrison of loyal Canadians to guard the Imperial flag that still floated over the an-

cient fortress.(1) A similar task devolved upon Captain G. A. French, R.A., with respect to Kingston.(2) How we have performed those duties is I believe being recognised by conferring on the Officers and soldiers we have trained during seven laborious years the honourable title of "Royal Canadian Artillery." What that labour was, can best be judged by any professional soldier picturing to himself the task of raising and training an artillery garrison and re-arming a fortress without professional assistants,(3) as well as forming and conducting a theoretical and practical school of all arms, as may be seen by the curriculum of subjects taught. The scholastic monotony has been varied by the necessity for using my pupils to suppress civil disturbances, but *vires acquirit eundo*. To the assistance given by Master Gunner Donaldson, R.A., and the sergeant gunnery instructors, I am indebted, but the credit is mainly due to the good material I had to work upon, *i.e.*, the gentlemen selected as Officers, viz., Lieutenant-Colonel Montizambert and those at Quebec, whose zeal, ability, and natural soldierly qualities rendered pleasant a task at times depressing from want of encouragement in quarters where I have perhaps unreasonably looked for it. I have no doubt that Lieutenant-Colonel French, my late colleague, as well as Lieutenant-Colonel Irwin, would endorse these remarks as far as concerns Lieutenant-Colonel Cotton and the Officers of the sister Gunnery School.

The extract from General Orders in the Appendix will best explain the original and dominant idea in the formation of the schools, namely, to carry out garrison duties by means of recruits from the Militia, and at the same time to utilize this garrison as a gunnery school. It soon became evident that at least one battery of trained soldiers was necessary for garrison duties, with a Staff to instruct recruits from the Militia who should be supernumerary to the regular garrison, while of course eight horses were not supposed by any soldier to be sufficient for "instruction in riding and driving, moving field and siege guns, and general purposes." I have no doubt the originators of the plan fondly hoped, as I did, that it would be developed; but not a single gunner or horse has been added to the strength of the establishment during the seven years of its existence.

I obtained from Government the privilege of forage for the private horses of the Staff and of Officers attending the schools, and by so doing, have succeeded in horsing a couple of guns and in creating a riding establishment. If one may not point to success, it is at least permissible to tell one's mistakes. Mine was hopeful credulity in believing in the reasonable expansion of the Gunnery Schools to efficiency; and consequent rashness in undertaking the direction and command of a garrison, a Gunnery School, and what is practically a staff college for all arms, with the inadequate details laid down in the General Order. The last annual report of the Gunnery Schools may show some part of the result of seven years' labour; and

(1) It was a curious coincidence that the two regiments first to enter Quebec, after its capitulation were the last to leave it more than a century after. To an Officer and detachment of the Royal Artillery, escorted by the 60th Royal American Rifles, was given the honour of hoisting the British flag at the conquest. On the withdrawal of the Imperial garrison from Quebec, to an officer of the Royal Artillery, was handed over, by a detachment of the Royal Artillery and 60th Rifles, the flag, which I have no doubt my Canadian military children would honorably defend, it need be.

(2) Lieutenant-Colonel French subsequently organized the N. W. Mounted Police, and was succeeded at Kingston by Lieutenant Irwin, R. A., now Lieutenant Colonel in the Canadian Militia.

(3) The Royal Artillery Sergeant Assistant Gunnery Instructors were not sent out until the following spring. Meanwhile the fortress had been re-armed during a Canadian winter by recruits of three months. The Washington Treaty had not been signed, but faith in its provisions seemed perfect. The guns had been dismounted to enable the Royal Engineers to repair the platforms, and the troops had been withdrawn before there was time to remount them, but my task was comparatively lightened by the fact that all the artillery stores were left to my hand in the most perfect order by Captain Murray, R. A., under the directions of Colonel Gibbon, commanding Royal Artillery in British North America.

the report of Colonel Hewett, R.E., the indefatigable Commandant of the Military College at Kingston, will show the success of his struggle to carry out military instruction with a hitherto inadequate Staff.

The commercial depression of the past few years has been no doubt in a great measure the cause of delayed development of military educational establishments in Canada.

Part IV.—ARMAMENT AND SUPPLY.

Small Arms and Ammunition.

The infantry are armed with the Snider rifle, an excellent and serviceable weapon, better suited to our Canadian Militia than the Martini-Henry, of which it is to be regretted that the purchase has been commenced by Canada, as the General Commanding is of opinion "that we cannot afford to purchase the quantity in bulk, and to have volunteers armed with two sorts of rifles and two descriptions of cartridges on a line from the Atlantic to the Pacific, would be to court disaster if they were called upon to take the field."

There are only 70,000 Snider rifles in Canada, which when we deduct 40,000 in the hands of the Active Militia, leaves only 30,000 for our Reserve Militia which numbers 600,000 men, a portion of whom at least would have to be called out and trained in emergency. The amount of ammunition in the country is only 150 rounds per rifle, an amount which I fear the Canadian Militia might possibly fire away in one or two general actions.

The General Commanding points out the necessity for a further provision:—

"I cannot with a prudent outlook to the possibility of cartridges being suddenly required for service, recommend the diminution of our supply, which, on the contrary, should never be less than 300 rounds per rifle. Cartridges have to be imported from England, as I regret to say we have no manufactories in this country to produce them, and as Snider cartridges will by-and-by not be forthcoming in the Royal Arsenal, it may be necessary for us to bespeak them some time before we can demand our annual supply."

Indeed the manufacture of small arm ammunition appears to me a manifest necessity, as also that for artillery. To depend on a base 4,000 miles across the Atlantic in the event of emergency would be most hazardous; besides such a system would necessitate keeping a large stock on hand, which, with so perishable an article as ammunition, would be inadvisable, to say nothing of the constant changes in war material. The Militia of Canada without an arsenal to rely on, not only for ammunition, but for the manufacture and repair of gun-carriages, harness, camp equipage, without transport, commissariat, or ambulances, &c., would not be in an enviable position. The subject has been well treated in the Dominion Artillery Association Prize Essays for 1878, by Colonel Montizambert and Captain Prevost, of the Canadian Artillery.

The essay of the former has been printed in the proceedings of this Institution, and those wishing for details cannot do better than refer to it (Vol. XXII, No. XCIV). I shall not therefore enlarge on the subject, but simply remark that Halifax, Quebec, Kingston, and Ottawa are suitable localities for the establishment of arsenals and depots for supply. The first three are fortified, and contain suitable government buildings and lands, while the latter is far removed from the frontier. Both Toronto and Montreal, though centres of industry, are exposed, and have been captured in previous invasions by the Americans. The rate of labour is quite as cheap and probably more reliable as regards strikes than it appears to be in England, while the raw materials, iron, wood, leather, &c., are abundant, and of the best quality. Coals are not, of course, as cheap as in great English manufacturing centres, but the water power is unrivalled, and wood fuel (which is so abundant), when used as charcoal in the production of the finest ironwork, produces the most

reliable kinds, free from the sulphur and phosphorus which it is so difficult to eliminate from coal-worked iron. That produced at the Londonderry Steel Company of Canada, as reported on by Messrs. Gilbert & Son, Montreal, "is said to have a tensile strength of 65,000 lbs. per square inch, being more than 23 per cent. greater than that of the Ridsdale iron used for gun tubes in Britain. This iron in working also showed remarkable properties of welding." This subject of manufacture of war materials in Canada is of the greatest importance to the Empire, as rendering us self-reliant at a time when such self-reliance would be essential to the successful resistance of attack.

That most vital question, an organized system for the supply of infantry ammunition in the field, does not seem to have been considered.

Artillery Armament.

It is not necessary for me to describe the magnificent armament of the Halifax forts, nor to detail the armament of some 400 smooth-bore guns, scattered over the Dominion, but of little use in modern war, except against boat attack. I can best, perhaps, render service by pointing out the importance of converting this obsolete armament into serviceable rifled guns, in accordance with the requirements of modern war. The task is neither so difficult nor expensive as may be imagined.

In addition to the rifled guns already detailed as mounted, in Vancouver Island, and the harbour of St. John's, New Brunswick, there are at Quebec, eight 7-inch Armstrong breech-loading rifled guns. They have hitherto been considered very weak guns, but by the use of an improved gas check, and the conversion of the gun into a side breech-loader by turning the trunnions, as has been done lately at Woolwich, the gun may be made to take a large charge of the mild pebble powder, which will increase the power of the gun while it diminishes the initial strain on the breech. There are also two of the same 7-inch B.L.R., at Kingston. It was found that in extreme frost the breech-closing apparatus was difficult to open, but by resorting to a very simple expedient, I have overcome this difficulty, and the guns might be considered fairly efficient, especially from their dominant position at Quebec, where they command the comparatively unarmoured deck of an ironclad, which in approaching end-on, would present a most favourable parallelogram to artillery fire.

In addition to the Armstrong breech-loaders are ten 32-64-pounder Palliser, and two powerful guns presented by Sir William Palliser, an 8-inch and a 7-inch, converted on his own principle. I find from an old newspaper extract, that "these guns cost Sir William 700*l.* sterling. He had to buy them from Her Majesty's Government, and pay Sir William Armstrong for their conversion. The freight came to 60*l.* 10*s.* 6*d.* He has already ordered a third gun, given by the Dominion Government for conversion at Montreal, for which Sir William pays the cost, and a fourth 10-inch gun (which will probably cost more than the three others put together) he has ordered to be made in England, as a gift to the Dominion Government. He further offers to convert all her old guns without profit, commission, or royalty, to which he has a legal right by his patent. Why this liberality? Why this affection for old Quebec? Must we believe *noblesse oblige*? These are patents of nobility more noble than inherited titles, but Sir William has a claim to both. (It was during the period war was imminent with Russia), and the *Quebec Chronicle* goes on to remark, "The gift of Sir William Palliser is indeed a timely one; unlike anything in this age, it reads like a bit of old Elizabethan story, when English gentlemen from Devon, fitted out warships 'at their own charges' to meet the great Spanish Armada."

My first report after landing in Canada seven years ago, was to recommend the conversion of our useless old smooth-bores into rifled guns, on the Palliser principle, utilizing thereby the old carriages, sidearms, and general stores, and even the projectiles, the calibre remaining the same. Such an armament would be pre-eminently suitable to Canada, the defence of which will mainly depend on Canadian Plevnas. I have therefore continued to reiterate the suggestion in which I have been supported

by the Major-General Commanding since his arrival in Canada. In dwelling upon the economy of converting old smooth-bore guns to new rifles, I do not forget the fact that we require a few powerful first-class armour-plate piercing guns at St. John, New Brunswick, Quebec, and Vancouver's Island. Except at Halifax, where there is an Imperial garrison, we have not *one* such gun in the Dominion of Canada. My last report is as follows:—

“But as regards future armament, I would again solicit attention to the advisability of adopting the Palliser system for converting in this country the 400 old smooth-bore guns into rifles, as already recommended by the general officer in command, page xix of last year's report, since which the remarkable power developed by the chambered 7-inch Palliser gun converted in England renders it a suitable armour-plate piercing gun for coast defences, though for land fronts and entrenched positions along our extended frontier, I feel certain no better or cheaper plan could be adopted than the gradual conversion of our smooth-bores into 90-pounder, 64-pounder, and 40-pounder rifles at the trifling cost of about 120*l.* per gun, while the old wood and iron carriages, platforms, &c., could be utilized and new wooden carriages have been made in this country at a less cost than that of importation.

“The relative cost of constructing wooden carriages and traversing platforms at Quebec and importing iron or wooden ones is shown in the following estimate:—

“Comparative Cost of Home Manufacture and Importation of Garrison Gun Carriages.

	Imported from England.	Home Manufacture.
	\$ cts.	\$ cts.
It will be seen from the Woolwich Vocabulary of Stores that a wrought-iron double plate sliding carriage and platform will cost, with freight, etc., added, in round numbers, about.....	1,700 00	
The same of wood.....	639 00	550 00
do made in Quebec, as proposed.....		
Wrought iron carriage for 64-32-pounders about.....	375 00	
Wood carriage built in Quebec.....		170 00
do for 64-32-pounders, imported about.....	190 00	

“The manufacture of such material would not only be a saving of expenditure, but would be a benefit to the country by employing our own artificers and expending the money in the Dominion.”

It must be borne in mind that the Dominion Parliament will much more readily vote money to be expended *in the country* than send out of it for the purchase of war material.

“I beg to recommend strongly the report of Messrs. Gilbert and Co., Canada Engine Works, to favourable consideration; trusting that if I can report satisfactorily on the proof of the gun now nearly completed at Montreal the Government will not hesitate to order the gradual conversion of the 400 smooth-bore guns now comparatively useless on our fortifications, and that a sum of money will be placed on the estimates to meet this expenditure as well as that for seventeen 7-inch Palliser rifles in lieu of seventeen 64-32-pounders previously ordered from Woolwich by the Dominion Government.

“The differences of cost between the home manufacture and importation speak for themselves. The efficiency of Canadian manufacture will, I believe, be established by the proof of the gun now being constructed, as well as inferentially from the fact of the success in the United States of the Palliser principle of conversion and construction. I would, however, for the future manufacture in conversion of 64-32-pounders recommend that the A-tube be prolonged about 2 feet 6 inches beyond the muzzle of the cast-iron gun, which would allow of sufficient length for the use of pebble powder, which being slower burning and exercising less strain on

“the gun, yet gives a higher initial velocity than the *poudre brutale* for which the short Woolwich guns were originally constructed. With the addition of the chamber I believe the 64-32-pounders could be made to penetrate considerably more than 5 inches of iron, as it has already done. The cost of this change would be inappreciable and the practical inconvenience of increased length *nil*, as the preponderance already existing would allow of an increase of 4 feet of A-tube if required for ballistic purposes. I believe it would also be advisable in lieu of studs to adopt the expanding base-ring system so successfully experimented upon at Shoeburyness, and already introduced in the United States as invented by Captain Butler, U.S.A. It will be seen that a system of *gradual conversion* will enable us (at a minimum of cost and maximum of efficiency) to avail ourselves of the scientific experiments carried on at Shoeburyness and elsewhere.”

When it is remembered that science has to wait upon her handmaid, mechanical skill, the comparatively circuitous yet progressive march of modern artillery is not surprising. The earliest guns were of great length to allow the consumption of the weak slow burning powder. They were composite breech-loaders of coiled wrought iron. When the powder was improved, the breech closing apparatus in the infancy of mechanical skill could not be made strong enough, and had to be abandoned for muzzle-loading, the cumbersome length was got rid of. Then the powder, being so improved as to acquire the title of *poudre brutale*, had to be modified as to reduce the strain of enormous charges on monster guns, which will again have to be lengthened and chambered and probably breech-loaded. The diagram perhaps indicates the direction of the next step in the march of artillery. It is not within the scope of this paper to discuss the claims of various systems, and certainly not hastily to condemn our own (which in spite of the impetuous attack made upon it since the accidental burst of a single gun) has stood the test of time, and will no doubt be further modified to suit modern requirements. Under the circumstances, however, I must respectfully admit that I do not regret that the advice, I presume given by the Colonial Defence Committee, to purchase short Woolwich guns, has not been followed by the Dominion of Canada.

Meantime the batteries of garrison artillery organized at the important points marked on the map should be employed in constructing batteries reveted with the iron-band gabions so easily constructed from the hooping of bales of goods. Such revetments would last half a century with but little repairs, and if armed with 64-32 Palliser converted guns to prevent close attack, and cover torpedoes would render secure the harbours of our long lake frontier, as well as other important points, which the economic application of the Moncrieff principle would render very formidable. The requirements of a country like Canada and the peculiar aptitudes of its people require that European military organizations should be modified to suit them.

The Militia garrison artillery and engineer corps should be amalgamated to form a universal pioneer corps to work guns of position or garrison, as well as construct and arm the batteries they fight, which would most probably be raised in conjunction with torpedo systems. The other rough pioneer work of bridging, &c., would come most naturally to the intelligent Canadian mechanics who mostly compose the corps of garrison artillery and engineers. The latter corps are very few in number, and in isolated positions.

In conclusion, it must be borne in mind that Canada never has been and never can be dependent on British bayonets. The history of her struggles against invasion showed that she could and did, with the assistance of but few British troops, bear the brunt of it with her militia, who almost unaided rolled back the tide of war from her shores. Before the conclusion of the Treaty of Peace in 1814-15, not a single American sentry or post remained on Canadian shore, while we were in possession of Fort Mackillimacinak and other points in what is now the State of Michigan.

Part V.—CANADIAN CONTINGENT FOR IMPERIAL SERVICE AND MILITARY COLONIZATION.

"When danger of war, real or imaginary, threatens the empire, the first thought is what a broad mark the circle of British Colonies offers to an enemy: the second, by what a mighty circle of fortresses and outworks the centre of British power is defended. The second thought is the sounder. Merely to extend territorial possessions is to give so many more hostages to fortune in war. The more the British Empire is of this character the weaker its line of defence. But expansions of territorial dominion which have widened the limits within which the Anglo-Saxon race can spread and multiply, add to the vitality of the Empire. The British Empire is self-sufficient if its resources can be brought into juxtaposition so as to supplement each other." (1)

The offer of a Canadian contingent suggested very forcibly the capabilities England possesses for military purposes in its Colonies, and what very little use has hitherto been made of them.

"Were it possible to imagine Germany, Austria, or Russia possessed of Colonial dominion like ours, we may be sure the first thought to occur to the rulers of any of these Empires would be the contingent each dependency could be made to contribute to the army." But though England has neither the power nor the desire to enact a military contribution of men from the colonies, yet what could not be demanded was volunteered!

"The staunch and remarkable loyalty of Canada to the British Crown has not perhaps ever been more significantly manifested than during the early part of the past and previous year, when offers of service in the event of war were preferred to the extent of raising in Canada several thousand men to serve with the British Army. These offers, some of personal service, others to raise battalions, bore the stamp of a thorough determination to give willing and material reinforcement to Her Majesty's troops. They were the spontaneous expressions of a loyal and a high spirited people to throw in their lot, as a very important factor, in the destinies of Great Britain. These offers were as cordially received by the Imperial Government as they were loyally made, and should the occasion have arisen, no doubt but that the hardy and stalwart sons of Canada would have been found standing manfully shoulder to shoulder with their native-born brethren of that 'old country' which they love so well." (2)

Let us hope that in quieter times the generous offer will not be forgotten on either side.

A peace military system that does not admit of ready expansion to meet the emergency of war without dislocation is not worth the money spent on it.

Of the 12 military districts into which Canada is divided, 11 and 12 (Manitoba and British Columbia) are still comparatively unpeopled territories, and need not be considered in the present plan. It was proposed that the Canadian war contingent, 10,000 strong, a brigade of three field batteries, an artillery pioneer corps, combining the duties of siege or position artillery with those of pioneers artificers, and a regiment of cavalry.

The nucleus and recruiting dépôt of this force in peace time to consist of two small battalions of 500 men each, each company 100 strong named, numbered after, and recruited for and affiliated with the head-quarters of each of the 10 military districts. Commanding Officers of Militia Corps forwarding to the Deputy Adjutant-General of each military district the names of Officers and men wishing to serve in the contingent, Officers of the School of Gunnery, and Military College Cadets being given a preference. The Militia Medical Officer of the district staff could examine recruits to prevent ineligible men being forwarded to battalion head-quarters. The two dépôt battalions could be further divided into wings if necessary, and quartered

(1) From a leading article in the *Times*, March 8th, 1879.

(2) General Sir Selby Smyth's Report.

at St. John, New Brunswick, and Quebec, with detachment on St. Helen's, Montreal, and Fort Isle-aux-Noix.

The other battalion divided between Kingston and Toronto, with a company doing duty as a guard for the Governor-General, furnishing orderlies at head-quarters, &c. There is barrack accommodation at all the above places except head-quarters, and the barracks at St. Helen's and St. John's, both burnt, would have to be rebuilt.

The artillery organization would only require the present gunnery schools at Kingston and Quebec to have the horses increased to a complete field battery for each, and an artillery artificer or engineer company added for the repair of fortifications, war material, &c.

The cavalry might be represented by a troop at Toronto and one at Quebec, there being a riding school at both places.

The above would amply provide for garrison duties, maintaining internal order, and the instruction of the Militia, while there could be expanded into an army division for war service on their own frontiers in Europe or Asia, or such proportions of them, one, two or three battalions as might be wished for, such service battalions being paid by Great Britain when serving out of Canada. The dépôt battalions always to remain and recruit in Canada, invalids and time-expired men being returned to their original companies for discharge.

I believe the above is the only feasible organization for an Imperial contingent. The offers of service made by certain Militia corps *en bloc*, though well meant, were quite incapable of fulfilment without dislocating the agriculture and commerce of the country as well as its home defence.

It is to be hoped the mistake made in raising the 100th Canadians will never again be repeated. They are probably a serviceable corps, but having no recruiting dépôt in Canada they have long ceased to have anything Canadian about them, beyond the maple leaf badge they have carried to serve in our Indian Empire. There seems to be a madness among a certain class for ignoring the sentiment of soldiers. Discipline and *esprit* suffer when soldiers are made to bear a badge and title to which their hearts do not respond.

There would be a difficulty about the rates of pay for an Imperial contingent. The present Canadian rates of pay of Officers are higher than those of the British Army, and how ever willing, there are not a numerous class in Canada who would be able to serve the Empire even partially at their own expense.

Military Colonization in Canada.

In considering the question of a Canadian contingent for Imperial service, it would be manifestly unjust and impolitic to allow many of the young men of a young country to be absorbed by military service in Europe, without making provision for their final return and settlement in Canada. To the young men themselves and their relatives it would be equally cruel and unjust to pay them off in London or elsewhere, at the conclusion of their service, with a few pounds in their pockets, perhaps to become waifs and strays of the great floating demoralized population of some great city. Undoubtedly emigration is one of the great questions of the day, which will not be answered by "Drift." 40,000,000 on a comparatively small island, with inadequate food supply, and failing manufactures, on the other side of ten day's sail, 4,000,000 scattered along a riband of 4,000 miles, i.e. the population of one city, London, occupying or rather struggling with the cultivation and development of a territory as large as Europe, with an arable area equal to that of Europe without Russia.

Manufacturing magnates may for manifest reasons discourage emigration, neglect our colonies, keep home population at starvation point, until they have been met by strikes that paralyse industry, and threaten to transfer our trade to foreign countries. Then instead of the people being encouraged to emigrate, they are taught to clamour for those agrarian laws that will sooner or later shake Great Britain, as they

shook Rome, to her very foundation, unless the emigration question is systematically considered and encouraged. We have been willing to struggle for black empire as long as it required cotton clothing, but as soon as it threatens to cover its nakedness without Manchester help, we say perish India! or Africa, or anywhere else that won't clothe itself with our cotton, and yet we ignore the manifest means of protecting ourselves by a commercial Zollverein with our colonies. Surely British merchants don't need to be taught by British soldiers that commerce means empire, and *vice versa*. The German Empire was consolidated by commerce, not cannon. The treaty of the Zollverein, in 1851, paved the way for that reunion of the German Principalities consummated at Sedan, yet we seem indifferent to the commercial development of an Anglo-Saxon Empire and its commercial relations with ourselves, which are surely capable of adjustment to the mutual advantage of ourselves and our colonies. Canada has already led the way by proposing differential duties against the United States, manifestly in favour of Great Britain, whose press, misunderstanding the points at issue, has met her with expressed displeasure, instead of encouragement.

True there is room for uneasiness as to how far the trade self-protection of Australia and Canada, as opposed to protection of the general Imperial interests, may be carried, but the game is yet in our own hands. Commercial union with our colonies is surely possible, unless we decline to discuss the matter with them, and prefer the system of "drift." Let us remember that though we drifted into empire in the east, we drifted out of it in the west, when a question of tariffs in 1776 lost us the American colonies, and a hundred years later those colonies were still suffering from the internecine strife that again rose out of a question of tariffs, though the slavery question was the stalking horse selected.

India can never be the home of the Anglo-Saxon yeoman. It is a magnificent field for the cultivation of military and administrative talent among intellectually selected specimens of our upper classes. The birthright of the British yeoman, the broad lands of our colonies, were of necessity ceded with responsible government to the Colonial legislatures. The Crown lands no longer belong to the Crown of Great Britain, and this is the main impediment to any extensive system of organized military emigration. Yet as it is manifestly to the advantage of the colonies that there should be an organized system of emigration, instead of leaving them to the unhappy-go-unlucky want of system by which stowaways and criminals, effeminate clerks, and gentlemen whose heads are sometimes as soft as their hands, may drift to their shores.

Hitherto the military emigration of British Officers and soldiers has failed because it was based on wrong principles, and that lately attempted by Canada herself in giving grants of land to the time-expired soldiers of the battalions sent for service to Fort Garry has benefited nobody but land speculators, because it was based upon broad republican principles, which do not suit soldiers or men habituated to discipline. An indiscriminate grant or land order for 160 acres was given to Officers and men alike. The grant had a name, but no local habitation; its whereabouts was not defined; to the mind of the supposed settler it might turn out a shaking swamp (muskeg), a strip of alkaline desert, or an uncleared wilderness of valueless wood. No Officer of sense or self-respect would think of settling down on an equality with Private Tommy Atkins and Mrs. T., to whose husband he had so lately administered pack-drill. Unscrupulous Officers were tempted to buy the prospective claims of their men for the price of a few bottles of old rye whisky, not to become *bona fide* settlers, but to hold and subsequently to sell to land speculators. I am speaking with a knowledge of facts.

Again, the old colonization by Imperial troops was based on the idea that every soldier, after perhaps 21 years' hard service, mainly in tropical climates, was fit, in comparatively old age, to blossom into a successful colonial farmer, no matter what his antecedents—being without capital, energy, or agricultural experience. The first or second semi-arctic winter of Canada drove him to despair and drink, to which military service in old times only too frequently predisposed a man. As for the

Officers, not having been in the first instance granted estates commensurate with their rank, and having spent most of their capital or retired pay in the purchase of land, they sank to the level of the rank and file, and their sons, often without proper education, intermarried with the daughters of the ordinary working population, or in some cases of their father's servants, who eventually owned the farm on which they had been hired to work. Canada is strewn with the wrecks of the families of British Officers. Of course there are exceptions to every rule. One of the most striking is that of the descendants of the 79th Highlanders, Officers and men, disbanded after the war in 1760, settled at Murray Bay, near Quebec, 15 years afterwards. They left their farms to march against the American invading Canada, and returned to their ploughshares when they sheathed their victorious claymores.

The settlement of the 79th Highlanders was upon the old French feudal system. The Colonel and Officers were given seigniorial grants of land and magisterial privileges, and their descendants are still to be found loyal to the Crown, and curiously enough the seigniorial estates have devolved upon another Officer of the 79th, nearly a century after the original settlement, by right of his wife, the daughter of the last seigneur. The seigniorial privileges have been abolished.

The original settlers were not supplied with Scotch wives, and the amiable little French Canadian girls with whom they intermarried made them good Catholics and happy fathers of a numerous progeny, still retaining the typical frame and vigour of the Scot though speaking in the softer tongue of France.

Emigration to the old province of Quebec is no longer required. The French Canadians have increased so rapidly as to have already emigrated in considerable numbers to the United States. And the fertile province of Ontario has also got far beyond the need of military emigration, but it is required to open up what will be the great grain-producing valley of the Saskatchewan with its coal-fields—a fertile belt of alluvial prairie soil with an acreage about equal to that of Spain, France, and England put together. Here such pioneers would be wanted in the first instance to build the Pacific railroad, guard the depôts of supplies, &c., form settlements along the route, and give military security against Indians at a cost that could scarcely, by any possibility, reach what Canada already pays for her mounted military police, 1,000 dollars per man per annum. Far less would be the cost of the passage of military settlers and their families with a supply of three year's rations and agricultural implements, while the covered carts that conveyed them to their location on their prairie home would give shelter until quarters were constructed. British Columbia, especially along its southern frontier and in Vancouver's Island, requires such military settlements, for manifest reasons it is not necessary to discuss. The climate is more favourable to our race than that of any colony, except perhaps New Zealand and Tasmania; it resembles England without the east wind. The same physical causes that have contributed to England's greatness will, to a certain extent, create in Vancouver's Island in no very remote future a prosperous country. The equable temperature produced by the equatorial current, corresponding in the Pacific to the Atlantic Gulf Stream, brings down the isothermal lines far south of the corresponding latitudes on the eastern coast, creating a climate that gives a maximum of working days in the year as against climates of extremes. Vancouver's Island and British Columbia is as large as France and Ireland, but the arable area is contracted by the mountain ranges; there are, however, vast tracts of brush-grass suitable for herds that require no house wintering. The coal, iron, and gold, and splendid timber not far from a series of magnificent harbours, will make Vancouver a trade starting point from America for Asia—as England has been from Europe to America. If there is any truth in Buckle's "History of Civilization," that Western Britain will be great! when the Californian receiving no fresh blood from Europe, has degenerated into the *sans souciance* of the southern European.

This is the country that asks for secession for want of railway arterial connection with Canada. It is too far for our population to reach it by the ordinary system of "drift."

The short-service system of our Army will supply a young, vigorous, and intelligent class of emigrants, who have been long enough in the Army to learn habits of order and obedience without being so long as to acquire a dislike for hard labour, or the intemperate habits too often the result of monotonous and protracted service in a tropical climate. To lead your short-service Army reserves, and settle them where they are most wanted, on the exposed frontiers of the Empire, as the Roman legion was planted with their Officers to hold the line of the Danube, and become in long ages the Roumanian peoples, you soon will have by the Compulsory Retirement Warrant a plethora of young energetic Officers condemned prematurely to linger grumblingly on the steps of "the crutch and toothpick." You may find among them though now "mute and inglorious," some Raleigh or Miles Standish, and (if less visionary and fanatic than Elizabethan or Puritan heroes) crowds of such self-reliant cavaliers as planted the Old Dominion that you lost through "drift." Let your young, though time-expired soldiers, go and build you up a new Dominion on the Pacific slopes. The lands which no longer belong to the Crown may be regained by the purchase of shares in the Canadian Pacific Railroad, in accordance with the original plan proposed by Sir John A. Macdonald, Premier of Canada, viz: To build the line by the sale of land of no value to Canada until settled, allotting a strip of territory along the proposed Pacific Railroad route as a portion of the shares and security of those who advanced capital to build the line. Other railway schemes, notably the Grand Trunk, have been the ruin of many, because almost all the shares were in the hands of holders living in England. See that the Canadians take a fair share of this responsibility, which they are quite ready to do, seeing they have attempted to build the road alone without help beyond an Imperial guarantee to their loan of 3,000,000. Railway stock may sink, an Egyptian Khedive may repudiate, but soil along a railway in a suitable climate cannot remain valueless, and is a material guarantee against loss. To enable the Imperial Government to carry out an organized scheme of military colonization, it will be necessary for her to purchase stock (which will carry with it land) in the Canadian Pacific Railway. It is a truer, safer route to India through her own territory than that she purchased by her shares in the Suez Canal. Canada should of course start a similar system by selecting military colonists from the Officers and men of her permanently embodied Militia and contingent for Imperial service when the necessity for such arises. She will by this means not only develop her territory, give it protection, but obtain efficient military service without running into the bottomless expenditure of Army pensions. (1)

The success of any such system will depend entirely on selection pure and simple of qualified Officers, who must be let alone in their sub-selection. Any attempt at development of the "poor devil, give him a berth, system," can't possibly succeed, when men have to contend against nature, who must be fought with her own weapons "selection of the fittest."

The selected three years' time expired good conduct non-commissioned officer or soldier from the British Army or Canadian regular troops, should sign an agreement to serve five years, but be liable to dismissal for misconduct or laziness, the first two in one of the Canadian depôts of regular troops. He would learn the country, and the depôt Officers would learn his character and ability. At the expiration of the first two years of probation, he would be sent on to a military farm on the Pacific railway or frontier of British Columbia, where he would be employed in constructing the railway and learning practical agriculture on the Government farms under Officers and non-commissioned officers who had learned the work by similar previous training. Should he still have conducted himself well, and shown that he would be likely to succeed on a farm, he would be given one in a series of villages.

(1) The British capitalist will serve himself and his country better by investing in such a railway and colonization scheme, rather than by lending his money to Russia for the construction of strategic railways.

His house he would previously have assisted to build with his comrades while working as a military labourer; during his five years' period he would be receiving rations and pay; but after being started on a farm with a house and implements and rations till the first harvest was reaped, he should require no more assistance, but be still liable to frontier military or police service, and military discipline under his chiefs. It would be necessary to continue pay to Officers and non-commissioned officers supervising work and maintaining discipline for which it would be necessary to invest them with magisterial powers.

APPENDIX No. 8.

REPORT ON THE DEFENCE OF BRITISH COLUMBIA.

CITADEL, QUEBEC, 17th November, 1879.

SIR,—I have the honor to submit the following report on the defence of British Columbia.

I have treated the subject: first, on the general question of its vulnerability and the means of defence; second, categorically, in reply to the letters of instruction from the Imperial Government, copies of which (A) (B), given to me by Col. Lovell, C.B., R.E., are attached herewith.

I have the honour to be, Sir,

Your obedient servant,

T. BLAND STRANGE, Lt.-Col., R.A.,

Dominion Inspector of Artillery.

The Lieut.-General Commanding
Militia of Canada.

REPORT ON THE DEFENCE OF BRITISH COLUMBIA.

- I.—“General question of vulnerability and means of defence;
- II.—“The means to be adopted for placing the harbours of Esquimalt and Victoria in an efficient state of defence, by permanent works, the extent to which temporary works may be made available being reported;
- III.—Whether these two harbours may be considered independently, or whether, on the other hand, a scheme of defence must necessarily embrace both, bearing in mind that Esquimalt, as an Imperial station, is of primary importance;
- IV.—“The garrison required to be permanently maintained, and the manner in which such garrison should be constituted, stating the extent to which assistance in this respect may be expected from local resources;
- V.—“The advisability of providing defences for the coaling station at Nanaimo, from which the dockyard at Esquimalt and steamships navigating the Northern Pacific along the coast of America are chiefly supplied with coal.”

I.—“General question of vulnerability and means of defence.”

Referring to the last paragraph of the letter of instruction (B), herewith attached, “on the measures to be taken for the defence of the Pacific Coast of Her Majesty’s dominions in the event of war,” we are directed to bear in mind its distance from any naval arsenal, and the difficulties which must, therefore, attend hostile operations directed against it. I consider it my duty to bring to your notice the following facts, which show that the difficulties of defence are greater than the facilities for attack, and that the bases of hostile operations are much nearer than is implied in the paragraph above mentioned. Nevertheless, I am of opinion that it is

by no means impracticable to place the few vital points in a position of security, by the emplacement of powerful guns, supplemented by torpedoes and telegraph signals, and that a comparatively small garrison, aided by local resources, and the completion of communication by the Canadian Pacific Railway, would maintain the integrity of the empire, which, otherwise, I respectfully submit, will be endangered at no distant day from internal as well as external sources of disintegration. With regard to the nearest naval arsenal and base of hostile operations, the United States’ naval establishment at Meare’s Island and the ordnance establishment at Benicia, they are admirably situated as a base, and protected by the effective and heavily-armed works in San Francisco Harbour, and though the political system in the United States does not tend to efficiency in dockyards and arsenals, we must bear in mind the extraordinary energy of the people of the United States, their wealth, and power of rapid production of war material when once engaged in war.

The Government naval and ordnance establishments at Meare’s Island and Benicia would be immediately and largely supplemented by the private enterprise of the large forging establishments and factories, and the enormous material and shipping interests of the State of California, which is also connected by railroad with the coal and iron districts, and arsenals of the Eastern States. A second railway, already in progress, the Northern Pacific Railway, with a terminus on Puget Sound where coal is being worked (at Seattle). In fact, within two or three years there will be five lines of railways, besides a network of telegraphs, which will bring the Pacific Coast into direct communication with the Eastern States, in addition to the ordinary sea route from San Francisco to the Straits of Fuca, which would enable the United States to launch a large body of troops and war material from a point not many miles from our frontiers, before any assistance could be obtained from the nearest British base of supply—India. Our only telegraph communication between British Columbia and England, or even Canada, passes through the United States. This will be remedied at an early date, no doubt, and the Canadian Pacific Railroad will be pushed forward to completion. That portion already decided upon along a part of the Valley of the Fraser, to the navigable waters of that river, will open up a stock and grain producing tract which would otherwise have been tapped by the United States Northern Pacific line into Washington Territory, upon which our food supplies for Vancouver Island are now dependant—a state of affairs rendering serious defence impossible.

The United States’ Territory of Alaska being without a white population, need not at present be considered as a base of hostile operations, but the Russians have lately established a fortified base of operations on their Asiatic Pacific Coast in direct communication with St. Petersburg. During the late complications, when war seemed imminent, a Russian fleet assembled in San Francisco harbour, and while the British squadron was engaged watching a South American contest, a Russian man-of-war steamed up to Esquimalt harbour, and could have destroyed the solitary gun vessel lying there before she got up steam, burnt the dockyard and shelled the town. This was previous to the construction of the present land defences which are, however, far from complete, and should be added to, much more powerfully armed, and have telegraph signals to give notice of approaching vessels, all these and the following considerations point to the necessity of completing the defences of Esquimalt.

1. The cession of the central channel and Island of San Juan would enable the United States to confine us to a channel, in one part only two miles wide, by placing batteries on James and Henry Islands; there is a channel close to the Vancouver Island shore by which such batteries could be avoided, but that channel is intricate and unsuited to the general purposes of navigation; still more difficult would it be for the passage of a crippled vessel seeking a graving dock or harbour of refuge through the inland waters of the Archipelago or Gulf of Georgia.

2. I accompanied Colonel Lovell, R. E., in his examination of various harbours, Nanaimo, Bute and Barrard Inlet, and more particularly Barclay Sound and Alberin Canal. I obtained detailed information from Captain Hennell, an intelligent officer of

the Bombay army, who visited the coast as far as Port Simpson. The senior naval officer commanding the station, Captain Paget, R. N., afforded us every facility, and placed at our disposal H. M. S. "Rocket," commanded by Captain Orlebar, R. N., who also give us the benefit of his experience and knowledge, and I read carefully the reports of Admiral de Horsey and other naval authorities, as also of the Dominion Government Engineers. There appears to me no place so suitable for a naval station as Esquimalt.

3. There are other sides to this very complicated and important question, many points of which do not present themselves to those who can only form conclusions from maps, such as suitability for settlement and capability of fresh food, water and coal supply.

4. Notwithstanding the difficulties which present themselves to the complete defence of Esquimalt, it cannot be advisable to ignore the large sums of money that have been already spent by the Imperial Government on the dockyard; on the graving dock by the Provincial Government, to which a subsidy has been promised by the Imperial Government; and finally, the expenditure on the batteries built by the Dominion Government.

5. The abandonment of Esquimalt as an imperial and naval station with a graving dock in favour of a more southern port not in our own territories, and where there is no natural supply of coal, on the plea of greater commercial interests south of San Francisco, would, I believe, be a mistake of a very grave character.

II. and III.—"The means to be adopted for placing the harbours of Esquimalt and Victoria in an efficient state of defence by permanent works, the extent to which the temporary works may be made available being reported."

"Whether these two harbours may be considered independently, or whether on the other hand a scheme of defence must necessarily embrace both, bearing in mind that Esquimalt as an Imperial station is of primary importance."

I find it advisable to treat heading II. and III. together, commencing with the latter as a natural order of sequence.

Strategically, it would be quite possible, and, perhaps advisable, to consider the defence of the two harbours separately. Breaking down the bridges from Victoria to Esquimalt, and fortifying the neck of the peninsula between the two harbours, abandoning the defence of Victoria town and harbour as difficult to secure and secondary in importance, not only could the town be shelled from Ross Bay, but boat landings could be effected at Cordova Bay and other places on the south-east coast. Nevertheless, morally, it would be inadvisable entirely to abandon the defence of Victoria, especially as Macaulay Point Battery assists in the defence of the entrance to both harbours.

The Dominion Government have already built the batteries, while the present armament is lent by the Imperial Government.

The defence of Esquimalt is mainly an Imperial question, as more intimately connected with the royal naval station and graving dock.

The character of the coast forming the harbours of Esquimalt and Victoria differs essentially in its want of boldness from the coast of the mainland of British Columbia. Comparatively low ridges of rock leave funnel shaped depressions open towards the sea, rendering impossible complete defilade from even a moderately curved artillery trajectory. The blue lines on the accompanying plan mark the possible lines of fire upon the dockyard and graving dock of Esquimalt, and on the town of Victoria, which could be taken up by hostile vessels outside the arcs of fire (red on plan) of the present armament.

Unfortunately, the dockyard buildings appear to have been placed without any reference to protection, but being merely built of wood and exposed in position, it might be thought worth while to remove them to Indian Cove. As the harbour and graving dock cannot be removed, they must be defended by mounting artillery sufficiently powerful to keep an enemy at a distance, and prevent vessels lying in royal roads and shelling along the lines marked blue. But these depressions would be difficult of discovery by a stranger, and could only be utilized fairly by a vessel

anchored in that line of fire or steaming along it—a dangerous manœuvre if opposed by artillery of any power or accuracy.

For the defence, therefore, of Esquimalt, it would be necessary to complete the battery on Brothers Island, rendering it permanent by revetting it with masonry, placing a suitable pivot for the 8-inch guns, renewing the platforms, building an expense magazine and artillery store. It might be necessary to throw a few loads of stones to form a small breakwater across the little Horse Shoe Bay in the centre of the island; the same applies to Macaulay Point Battery, the natural escarpment of which is being gradually washed away by the sea.

I entirely concur in the recommendation of General Sir Edward Selby Smyth and Admiral De Horsey, that a powerful battery is essential on Signal Hill, which commands, not only the sea approach, but the two roads from the land side, as well as the whole interior of the harbour. A couple of 9-inch M. L. R. 12-ton guns, mounted in Moncrieff pits blasted out of the rock, would, I think (as giving an all-around fire it would be impossible to silence), form a very valuable element of defence.

Rodd Hill presents a very favourable site, the ground forming natural embasures and traverses, with a sheltered site for a magazine; it is easily accessible by boat from the dockyard; the fresh-water supply is there. A heavy battery should be built on Rodd Point to protect the entrance to Esquimalt, and to cross fire with Brothers Island and Signal Hill batteries and Macaulay Point—2,500 yards. The armament should not, in my opinion, be less than 9-inch 12-ton M. L. R. guns. They would also bear up the royal roads, and a ship entering offers a favourable parallelogram of fire to them. A portion of the Rodd Hill Battery would also enfilade the tongue of land forming the shore of the salt lagoon. It would, however, be advisable to build a block house on Belmont Hill, otherwise a few riflemen would render the Rodd Hill battery untenable. Belmont Hill takes it in reverse at about 400 yards.

Fisgard Island is too small and rocky to be used advantageously as a heavy gun emplacement.

I would not propose any but heavy guns for the defence of Esquimalt, with the exception of a battery of four heavy field guns, 16-pounder R. M. L., with harness, &c., complete, to be handed over to the Canadian Militia Artillery, and horsed by farm horses to meet boat attacks either on the several bays south-west of Victoria, from which there are good roads to the town, or to repel a landing to the eastward in Sooke Harbour. In this direction the rough and densely wooded character of the country will confine an enemy having to land supplies and ammunition to the road, which could easily be closed against him; and any counter barricade of such road, by felled trees, could only be forced with artillery. The country round Victoria, especially west of it to the sea, is comparatively open and suited for field artillery. On the principle that it is always advisable to place batteries in advance of what they defend, it was contemplated to recommend the construction of a battery on the high land between Albert Head and Rodd Head, to bear on vessels coming up the roads to the entrance of Esquimalt, with 5,000 yards extreme range to Macaulay Point; but I do not consider it advisable for the following reasons:—

1st. It would extend the defence beyond the powers of the small body of men that would be available. It is 11 miles from Victoria by land.

2nd. Such a battery would be liable to be taken in reverse by an enemy from Sooke Harbour advancing along the road and across Sangster's Plains.

3rd. The height being 250 feet, extreme depression 7°, gives range of 600 yards, inside which a vessel would be secure from its fire.

Supposing the battery were withdrawn 300 yards from the shore, the water is deep enough to allow a vessel running along 300 yards from shore.

Torpedoes.

The presence of the Royal Navy would render the storage at the dockyard of materials for a torpedo system a natural precaution, while the laying them down in time of war would naturally form part of their duty. Their manipulation might be left to the proposed garrison of marine artillery.

A system of telegraphic signals, from Albert Head round the coast to south and east of Victoria, could easily be established and maintained by the above mentioned garrison.

With regard to the temporary works constructed by Lieut.-Colonel Irwin, Inspector of Artillery, taking into account the small sum of money and the inadequate means at his disposal, I am of opinion that they could not have been better devised or executed, with the exception of some trifling details of no great importance. A Battery on Holland Point would have commanded, more effectually, the entrance to Victoria Harbour, but Lieut.-Colonel Irwin was directed not to occupy that site on account of the sum of money demanded for its purchase. A battery on Holland Point for a couple of seven inch $6\frac{1}{2}$ -ton guns is therefore necessary to protect the mouth of Victoria Harbour, by a cross fire with Macaulay Point. Victoria Point Battery does not entirely command the entrance to Victoria Harbour—the fire of the right gun is masked by points of land running out and by intervening woods. It would be desirable to render the present works permanent by revetting the interior slopes of the gun positions in stone or brick, while the other slopes could adequately be secured by upright cedar stockade revetment.

It has been previously pointed out that the present batteries at Finlayson and Victoria Point can be taken in reverse, by attacks from boats landing in Cordova and other bays to the eastward.

A central keep, with a couple of Moncrieff pits, on Beacon Hill, would have a considerable sweep to seaward, and would also command the gorges of the above mentioned batteries, as well as one that might be erected on Holland Point, but the expenses of such an undertaking would not, perhaps, be commensurate with the results gained, nor with the probable strength of garrison available. Moncrieff pits, if constructed on Beacon and Signal Hill, respectively, would require, in great measure, to be blasted out of the rock, but the cost of revetment would be saved, and the protection of the gun, carriage and stores from weather or depredation would be complete by covering with a shingle roof. Such temporary shelter would be easily removed for service, and need not interfere with gun practice. In lieu of erecting a central keep on Beacon Hill, I would recommend closing the gorges of Macanlay, Finlayson and Victoria Point Batteries with stockades. A portion of the wood which grows thickly up to the gorge of Finlayson Battery would have to be cleared away. Estimates for stockading herewith.

Estimated costs of closing the gorges of batteries by means of stockades constructed of sawn cedar posts 6 x 6 inches, painted at top, coated with coal tar for 3 feet 6 inches at bottom to prevent decay, and loop-holed, or so arranged as to admit of small arm fire against any land attack.

Macaulay Point Battery.

426 feet, 1,278 posts 11 feet long, 6 x 6-inch sawn cedar, at \$16 per 1000 (board measure).....	\$687 00
Digging 426 feet trench 3 feet deep, tarring and setting posts, including loop-holing.....	100 00
	<hr/>
	787 00

Finlayson Point Battery.

330 feet, 990 ³ posts 11 feet long, 6 x 6-inch sawn cedar, at \$16 per 1000 (board measure).....	\$522 00
Digging 330 feet trench 3 feet deep, tarring and setting posts, including loop-holing.....	77 00
	<hr/>
	599 00

Victoria Point Battery.

260 feet, 780 posts 11 feet long, 6 x 6-inch sawn cedar, at \$16 per 1000 (board measure).....	411 00
Digging 260 feet trench 3 feet deep, tarring and setting posts, including loop-holing.....	61 00
	<hr/>
	472 00

Total estimated cost of stockade, \$1,858.

The Macaulay Point battery is included, because, though it might be secured in war if the neck of the peninsula between Esquimalt and Victoria were entrenched, yet, if it were reached by a land attack, it would be rendered completely untenable by a few riflemen posted on the rock ridge, about 500 yards distance. The proposed stockade would defile the excavated *terre plein*, and afford means for musketry fire in reply. They would also tend materially to preserve the batteries from the depredation of cattle and marauders who have already broken into, plundered the magazines, and carried off some of the gun stores.

TO RECAPITULATE.

Armament of Esquimalt, in Addition to Present Armament.

Rodd Point.—Four 9-inch 13 ton R. M. L. guns on traversing platforms and carriages.

Signal Hill.—Two 9-inch 12 ton R. M. L. guns on Moncrieff carriages.

Present Armament.

Brothers' Island.—One 8-inch 9 ton R. M. L. gun, 2.64 pdr. 64 cwt. R. M. L. guns.

Macaulay Point.—Three 7-inch $6\frac{1}{2}$ ton R. M. L. guns.

Present Armament for Victoria.

Finlayson Point.—Two $\frac{3}{4}$ pr. R. M. L. guns.

Victoria Point.—Two $\frac{3}{4}$ pr. R. M. L. guns.

Proposed Additional Armament.

Two 7-inch $6\frac{1}{2}$ ton R. M. L. guns for proposed battery on Holland Point.

For Opposing Boat Attack, &c.

Four 16 pr. R. M. L. field guns, carriages, harness, etc.

As the amount for Esquimalt will probably be furnished by the Imperial Government, it will doubtless be supplied from Woolwich, of the present service patterns.

Should the Dominion Government contemplate the purchase of any gun, I would not recommend the latter, because the gun question is in debate, being reconsidered by a committee at the war office, and a complete change in construction may be introduced, rendering obsolete the guns at present in store at Woolwich, which would be issued on purchase.

Great results have been produced by a long gun (chambered), and, in my opinion, the Dominion Government could not do better than apply to Sir William Palliser to construct such heavy guns as are required, those constructed by him for the United States being preeminently satisfactory in the opinion of the officers of the United States' Artillery, *vide* United States Artillery by Captain E. Palliser; for 64-pounder and smaller guns, it has been proved by the successful manufacture of

Mr. Gilbert, at the Canada Engine Works, Montreal, that our old smooth bore guns can be converted cheaply and successfully in this country.

The accompanying diagram will explain the difference between the short service guns and the proposed lengthened barrels, as suitable for slow burning powder.

IV. - The garrison required to be permanently maintained, and the manner in which such garrison should be constituted, stating extent to which assistance in this respect may be expected from local resources."

The smallest permanent garrison of regular trained artillerymen to man and look after the armament and works of Esquimalt would be 200 gunners, with a proper proportion of officers and non-commissioned officers. Having due regard to the instructions to bear in mind that Esquimalt is an imperial station of primary importance (*vide* III), I would recommend that this force should be marine artillery, for the following reasons: -

1. Being completely under the command of the Admiral of the station, there would be no divided responsibility.
2. The armament at present mounted is of the naval pattern, and could be replaced, if necessary, from the dockyard stores, together with ammunition, etc., Repairs could also be performed by the dockward artificers.
3. The pay, supplies and clothing of such force could be all carried out by the admiralty authorities.
4. If any other force than marine artillery were employed, it would necessitate special pay, commissariat, store and medical departments.

Local Force.

The employees of the dockyard, who are entirely naval artificers and have served afloat, should be embodied as a battery of auxiliary artillery on the principle of the old dockyard battalions, under the command of the superintendent of the dockyard. The terms of their engagement render them liable to this service, which, I have no doubt, they would be quite willing to render. This battery could be especially considered as a garrison for the two Monerief pits on Signal Hill the lift carriages for which could be kept in complete working order by them, with the aid of the machine shops, within a few hundred yards. As to feasibility of repair, no better arrangement could well be imagined. For the construction of the proposed batteries, a company of Royal Engineers would be required; if they were retained as part of the permanent garrison, the objections to a garrison from the Royal Artillery, as requiring a special supply department would not hold good.

The smallest permanent garrison of regular trained artillerymen to guard and fight the guns for the protection of Victoria and the harbour, including the batteries at Finlayson Point, Victoria Point, and that proposed for Holland Point, which are separated by considerable distances, would be 100 gunners, with a proper proportion of officers and non-commissioned officers.

I concur with Lient.-Col. Irwin that, "owing to the isolated position of Victoria, the very limited number of its population, and the high rates of wages paid for labour, special and almost insuperable difficulties are placed in the way of the establishment of anything like an efficient volunteer force, sufficiently numerous or well-trained for the purpose of manning this number of guns, and maintaining an effective fire against ships in motion, a duty the successful performance of which requires the greatest possible amount of training and intelligence on the part of the gunners.

"This force would serve as a nucleus and training school for the volunteers, could be profitably employed in the care of the several batteries, guns, stores, etc., and, if a sufficient number of artificers, such as stonemasons, bricklayers and carpenters, several of whom are generally found in the ranks of "A" and "B" Batteries, were included in their number, the work of converting the present earthen batteries into works of a more permanent character could be gradually carried on with a considerable economy of expenditure."

This force would have to furnish detachments for Nanaimo, New Westminster or Burrard Inlet, in view to the protection of the continental terminus of the Canadian Pacific Railway.

Experience has shown that the organization of the Canadian gunnery schools is better suited to the instruction of volunteer militia artillery than the mere presence of a garrison of Royal or Royal Marine Artillery, as at Halifax.

The annexed communication (C), from Capt. Dupont (Acting Deputy-Adjutant General, No. 11 Military District), shows the authorized strength of the volunteer militia of Vancouver Island and British Columbia, and gives the probable number of men capable of bearing arms that would be available in case of emergency. Capt. Dupont, who commands the battery of volunteer militia artillery, is a zealous and intelligent officer, whose opinion may be relied upon, and who deserves great credit for the efficiency he has produced in the battery under his command.

The care he has taken of the batteries and armament in his charge, and, indeed, for the manner he has performed the duties of Deputy-Adjutant General during the absence of Lient.-Colonel Houghton, D.A.G., my personal thanks are due to him for the assistance he has rendered me at Victoria. He proposes to qualify, by a course of instructions at one of the gunnery schools, which will, I trust, be sanctioned.

The force of volunteer militia at Victoria was inspected by Col. Lovell, C.B., R.E., who expressed a favourable opinion of their efficiency, especially of their gun practice.

Since the death of Sergeant Bramah, late Royal Artillery, Assistant Gunnery Instructor from "A" Battery, Capt. Tatlow, who has obtained a first-class long-course certificate from "B" Battery, has been appointed caretaker and instructor to the volunteer militia artillery. From my knowledge of him as an officer, I have no doubt he will perform his duties satisfactorily. I have to recommend, with a view to better training and instruction, that the increase to the battery of garrison volunteer militia take the form of a second battery, by changing No. 1 Company of Rifles into artillery (a change they themselves desire), as there are not sufficient men of the class willing to enrol to keep up the increased strength of artillery and rifles.

The battery of artillery commanded by Lient. Pittendreigh, late of Her Majesty's 3rd Regiment, might be completed by the addition of ten men and one officer, and a suitable equipment supplied, their gun carriages being rotten. A fourth battery should be raised at Nanaimo, the whole making a brigade of four batteries, commanded by Capt. Dupont, with rank as Lient.-Colonel, with Capt. Tatlow as Adjutant, Gunnery Instructor and Quartermaster.

The strength of 100 gunners, permanent garrison for Victoria, is calculated upon allowing four men per gun, regular artillerymen, for the batteries at Victoria, besides furnishing detachments for Nanaimo and New Westminster. The brigade of 160 men, volunteer militia artillery, making up the complement required for efficient working of the batteries, as well as manning the four 16-pounder heavy field guns, and two 24-pounder Howitzers at New Westminster, which might be found useful in securing the roads from the south, which unite at New Westminster, on the opposite side of the Fraser River. The position of New Westminster is a naturally strong one between the frontier and Burrard Inlet. The single road from the south through a densely wooded ridge on the south bank of the Fraser River, opposite New Westminster could be closed by Capt. Pittendreigh's guns, flanked by the rifle company and by auxiliary Indian sharpshooters.

(C.)—COPY (for Col. Strange's information).

Strength of the Volunteer Militia of B. C., and number of able-bodied men available for training on emergency.

MILITARY DISTRICT No. 11.
VICTORIA, B. C., Sept. 24, 1879.

SIR,—I have the honour, in accordance with your instructions, to report that the strength of the active militia in the Province of British Columbia, is as follows:—

	Authorized Number.		Actual Number.	
	Officers.	N. C. O. & Men.	Officers.	N. C. O. & Men.
Victoria Battery Garrison Artillery	5	85	3	50
No. 1 Company Rifles, Victoria.....	3	42	2	31
No. 2 do do do	3	42	2	34
Garrison Artillery, New Westminster.....	2	30	2	25
Rifle Company, do do	3	40	2	34
do Nanaimo	3	40	1	23
Total.....	19	279	12	197

The authorized strength of the Victoria Garrison Artillery has only recently been increased from 3 officers and 50 non-commissioned officers and gunners to 5 officers and 85 non-commissioned officers and gunners. The uniforms for this increase have not yet arrived; as soon as they are received the strength will be brought up to number authorized.

I have the honor further to report that I have made a careful estimate of the number of men capable of bearing arms that could be enrolled should an emergency arise and their services be required for defences of the places mentioned, and fix the numbers as follows:—

At Victoria, including the City and District, and the Town and District of Esquimalt.....	700
At Nanaimo, including Town and District, and Comox and Cowichan Districts.....	350
At New Westminster, City and District, including Burrard Inlet.....	350

Beyond the districts mentioned, excepting the mining villages of Barkerville, Stanley and Cassian, the population is so scattered that there are very few men who could, with safety, leave their houses, for the most part being without assistance, and too far separated from neighbours to aid or relieve each other, few men could leave their houses and families.

From the mining villages a small addition might be made to the numbers I have given, but several weeks would be required to enrol men and bring them to the coast.

If time admitted and arms were available, an auxilliary force of 1,000 Indians could, I have no doubt, be raised.

I have the honor to be, Sir,
Your obedient servant,
C. T. DUPONT, Captain,
Acting D.A.G.

Military Colonization.

The best defence of a territory is a loyal and contented population. A practical system of military colonization would add much to the security and development of the country. This subject has been treated in a paper, entitled, "Military Aspect of Canada," read before the United Service Institution, London, May 2nd and 7th, 1879.

It would appear that the most suitable spot for such a system of military colonization in British Columbia would be the delta of the Fraser, the embankment of such tracts, to protect them from the overflow of the river and high tides, as well as the construction of a canal to relieve the surplus waters, would be a work requiring special organization of a military character; it is not a work which can be carried out independently by individuals. The lands, when reclaimed, would be exceedingly fertile, and there is apparently no fever or malaria in the district.

The advantages of locating a body of military settlers on this frontier at the continental terminus of the Canadian Pacific Railway need scarcely be discussed; they might also be employed with advantage in the construction of the railway.

Irrigation, which is necessary in many parts east of the Cascade Range, especially along the frontier, is a species of labour in which military organization, or something akin to it, is essential.

In any case, should it be in contemplation to extend the system of army reserves to Canada by the formation of an Imperial Canadian reserve force, it is to be hoped its provisions will be extended to Vancouver Island and British Columbia.

V.—"The advisability of providing defences for the coaling station at Nanaimo, from which the dockyard at Esquimalt, and steamships navigating the Northern Pacific along the coast of America, are chiefly supplied with coal."

The defence of Nanaimo appears essential to our supremacy in the Pacific. Fortunately, the form of the harbour lends itself very readily to defence, Nanaimo and Departure Bay forming practically one harbour; Newcastle and Protection Island forming natural breakwaters and places for batteries.

The continental terminus of the Canada Pacific Railway will probably necessitate some batteries on the mainland of British Columbia.

Colonel Lovell, C.B., R.E., has the plans and estimates for the works proposed in Vancouver Island, of which I was to receive a copy.

I have the honour to be, Sir,

Your obedient servant,

T. BLAND STRANGE, Lt.-Col. R.A.

Dominion Inspector of Artillery.

Citadel of Quebec, November 7th, 1879.

A

WAR OFFICE, 1st July, 1879.

SIR,—His Royal Highness the Field Marshal Commanding-in-Chief, having been pleased to direct you to proceed to Vancouver Island, for the purpose of reporting on the defences, I have to inform you that certain measures were taken last year for the purpose of providing temporary defences, which were partially erected by officers of the Dominion Government, and armed with guns lent by the Admiralty.

The report of the Colonial Defence Committee of last year, forwarded herewith, will explain their views upon the subject. I also forward reports by Lieut.-General Sir E. Selby Smyth, Colonel Blair, R.A., and Admiral DeHorsey, R.N., referring thereto, with Lieut.-Colonel Irwin's plan of defence and chart of the port in question. You will be good enough to place yourself in communication with Lieut.-Colonel

Strange, R.A., Inspector of Dominion Artillery, who has been sent by the Dominion Government, and, after conferring with him, to report in detail on the following points.

1. The means to be adopted for placing the harbours of Esquimalt and Victoria in an efficient state of defence by permanent works, the extent to which the temporary works may be made available being reported.

2. Whether the two harbours can be considered independently, or whether, on the other hand, the scheme of defence must necessarily embrace both, bearing in mind that Esquimalt as an Imperial station is of primary importance.

3. The garrison required to be permanently maintained and, the manner in which such garrison should be constituted, stating the extent to which assistance in this respect may be expected from local resources.

These are the principal points to which your attention should be directed. But, I may add, that your report should be as full as possible and accompanied with plans and approximate estimates.

It is desirable that your inspection should be completed and your report furnished with the least possible delay.

I have the honour to be, Sir,

Your obedient servant,

(Signed) J. L. A. SIMMONS,

General.

To Colonel LOVELL, C.B.,
Commanding Royal Engineer,
Halifax, N.S.

B

WAR OFFICE, 1st July, 1879.

SIR,—With reference to my letter to you of this day, I am to request you, when in Vancouver's Island, to visit Nanaimo, which has been brought to the notice of the Secretary of State for War as the station from which the dockyard at Esquimalt and steamships navigating the Northern Pacific along the coast of America are chiefly supplied with coal.

The defence of Nanaimo may, therefore, become a matter of importance, as well for securing a supply of fuel for the use of British steamships, as for preventing an enemy from obtaining such supplies. The Secretary of State is, therefore, desirous of taking advantage of your visit to Vancouver Island to obtain your views as to the advisableness of providing defences for this post, and the means to be taken for its defence in case such a measure should at any time become necessary.

The Secretary of State for War will also be glad to receive any views you may form generally, on the measures to be taken for the defence of the Pacific coast of Her Majesty's dominions in the event of war, bearing in mind its distance from any established naval arsenal, and the difficulties which must, therefore, attend hostile operations directed against it.

I have the honour to be, Sir;

Your obedient servant,

(Signed) L. L. A. SIMMONS,

General.

To Colonel LOVELL, C.B.,
Commanding Royal Engineer,
Halifax, N.S.

APPENDIX No. 9.

LIEUT.-COLONEL STRANGE ON THE TRIAL OF THE CONVERTED $\frac{32}{4}$ POUNDER AT MONTREAL—AND SUGGESTING THE IMMEDIATE CONVERSION AND MANUFACTURE OF RIFLED GUNS IN CANADA, IN CONSEQUENCE OF ITS SUCCESS.

CITADEL, QUEBEC,
10th November, 1879.

SIR,—I have the honour to report that before starting for British Columbia, I left directions for proving the $\frac{32}{4}$ pounder gun, converted by Messrs. Gilbert & Sons, Canada Engine Works, Montreal, on Sir William Palliser's principle, with an elongation of the inner tube suggested by myself, with the consent of Capt. E. Palliser, acting for Sir William.

Herewith are forwarded records of the proof A, A 1, and B. I have examined them carefully, as also the final impressions taken after the last proof, with 24 pounds pebble powder, the heaviest proof on record for any such gun. I am perfectly satisfied with the manner the gun has stood the very severe and unusual tests applied to it, the last being three times the service charge.

The proof charge at Woolwich being only two rounds, 10 pounds, R.L.G. gun-powder, with 64-pounder projectile. The wrought iron sent from Londonderry, N.S., appears equal, if not superior, to any known iron, and the manufacture by Messrs. Gilbert excellent.

I have, therefore, no hesitation in recommending the Dominion Government to give an order to Messrs. Gilbert & Son, for the conversion of 20 32-pounders of 56 cwt. to 64-pounders, and 10 68-pounders and 8-inch into 80-pounders and 64-pounders, respectively.

There are only 2 68-pounders in Canada, at St. John, N.B.

The least expensive plan as regards transport would be to commence with those nearest Montreal, the point of manufacture.

There are, unfortunately, at Montreal only.....	2	32-prs.
To be sent from Quebec, from store charge.....	9	"
" Kingston " 	9	"
Total.....	20	32-prs.

There is at Montreal, in store charge.....	1	8-inch.
To be sent from Kingston.....	4	"
" Quebec Citadel.....	1	"
" Partridge Island.....	2	"
" " 	2	68-prs.
Total.....	10	

These guns when converted to be returned to the points from which they were sent. The $\frac{5}{8}$ pounders being suited to coast defence at Partridge Island, where they are now mounted. The $\frac{5}{4}$ pounders and $\frac{5}{8}$ inch converted being suitable for the defence of works on inland waters could also be used on board fast steamers extemporised as war vessels in emergency.

If the order for the transport of these guns was given at once before navigation closes, the expense of transport would be very much less. Messrs. Gilbert can also work more expeditiously at gun manufacture in winter, which is a slack time for other work.

The cost of conversion per gun would be in Canada, $\frac{5}{8}$ pounder, \$650. This is \$210 cheaper than the gun can be converted for at Woolwich. 500 rounds common shell at Woolwich prices, saving transport.

64-pounder 8-inch, \$820. If the converted gun is ordered in England, the cost of the original gun must be added, while those in Canada are of no value as guns until rifled. 500 rounds common shell at Woolwich prices, saving transport.

$\frac{5}{8}$ pounders, \$1,070. 500 rounds common shell as before. Each of these guns to be elongated for slow burning powder as far as preponderance permits, there may be a trifling extra charge for this additional length.

When in British Columbia, I was informed by the Superintendent of the Dockyard that he had received orders to issue no more ammunition until the guns and stores lent to the Dominion Government had been paid for. Should it be in contemplation to charge the Dominion Government for this armament, I should recommend its return to the Imperial Government as soon as the Dominion is in a position to replace it, and the substitution of a long 7-inch Palliser made by Gilbert & Son, at a cost of \$3,750 each. The Woolwich price of the short 7-inch being \$4,860, a saving of \$1,110, which would more than cover the cost of transport from Montreal to Vancouver. In any case I believe it would be advisable to order 12 9-inch long B.L. rifle guns on the Palliser principle, similar to that in process of construction for Canada, for the Atlantic and Pacific Coasts. It must be borne in mind that these heavy guns take time in manufacture and that a sudden declaration of war would leave us no time.

I have the honour to be, Sir,
Your obedient servant,
T. B. STRANGE, Lieut.-Colonel,
Inspector of Artillery, Com'd't G.S.

The Lieut.-General,
Commanding Militia of Canada.

Memo.—The 7-inch gun proposed by Sir William Palliser for coast defence would be $8\frac{1}{2}$ tons wt; 120 lbs. wt. of projectile; 35 lbs. powder; 161 ins., length of bore; I.V. 1,700 ft.

9-inch proposed would be probably 12 tons; 200 lbs., wt. of projectile.

The 68-pounder could probably be converted into a 90-pounder.

It would be advisable to purchase an electro-ballistic apparatus for finding initial velocity, as previously recommended.

T. B. STRANGE, Lieut.-Colonel,
Inspector of Artillery.

A.
BEFORE PROOF Return of $\frac{5}{4}$ -pounder Gun, converted by Messrs Gilbert & Son, of Montreal.
MONTREAL, 1st August, 1879.

Register No.	Mark.	Initial of factory and date.	Weight.				Condition of Bore.	Size of Vent.		General state of Vent and adjoining part of Bore.	Sentence.	No. of rounds fired at date of Return.	When mounted.		Remarks.	
			Tons.	Cwts.	Qrs.	Lbs.		Through Gauge.	Size at Bottom.				Station.	Date.		
1	G. R. III.	Gilbert, 1879.22	.22	Very good.	Aug. 2, 1879	Messrs, Gilbert.	Aug. 1, 1879	Very slight lead of thread shows in impression of cup. Condition of bore generally very good.

JAMES BARRINGTON,
Armourer-Sergeant, Examiner.

Certified.

JOHN FRASER, Lieut. and Brevet Major,
Commanding Detachment B. Batt. C.A.,
St. Helen's Island, Montreal.

The Commandant "B" Battery,
School of Gunnery, Quebec.

A¹.
AFTER PROOF Return of 64-pounder Gun converted by Messrs. Gilbert & Sons, of Montreal.
MONTREAL, 20th August, 1879.

Description.	Weight.				Initial of Factory & Date.	Mark.	Register Number.	Condition of Bore. Specifying any important defects not mentioned in Memorandum of Examination.	Sentence.	Vent.		General state of Vent and adjoining part of Bore.	Number of Rounds fired at date of Return.				Received from		Remarks.		
	Tons.	Cwt.	Qrs.	Lbs.						Through Gauge.	Size at Bottom.		Where mounted.	Station, &c.	Date.						
					Gilbert, 1879.	G. R. III.	No. 1.	Slight longitudinal tool mark $\frac{3}{8}$ length of bore R. of up. Slight coil mark $1\frac{1}{2}$ and $2\frac{1}{2}$ R. of up. Tool mark $3\frac{1}{2}$ L. Slight tool mark $10\frac{1}{2}$ R. of up to 16 L. of up; do $14\frac{1}{2}$ and $15\frac{1}{2}$ L. of D.; do $17\frac{1}{2}$ L.; do $4'$ 3". L. of D.; do $4\frac{1}{2}$ L.; do $5'$ 6" L. and L. Slight coil mark $7'$ 6 $\frac{1}{2}$ L. of D. Forge mark caused by paucity of metal, $7'$ 9" R. to R. of D. Slight tool mark $9'$ 9 $\frac{1}{2}$ up. Slight coil mark $9'$ 7 $\frac{1}{2}$ and $9'$ 7 $\frac{3}{4}$ R., as per impressions.	Serviceable.	22	22	Very good.	5 lbs. P.	8 lbs. P.	10 lbs. R. L. G.	10 lbs. P.	Total.	St. Helen's Island—Aug. 2, 1879.	Messrs. Gilbert & Sons, Montreal.	Aug. 1, 1879.	Cup well set up; condition of bore after proof shows "very good."

The Commandant "B" Battery,
School of Gunnery, Quebec.

Certified.

JAMES BARRINGTON,
Armourer-Sergeant Examiner.

JOHN FRASER, Lieut. and Brevet Major,
Commanding Detachment, St. Helen's Island,
Montreal.

(B)

REPORT UPON THE EXPERIMENTAL TRIAL OF THE 64 POUNDER GUN
(CONVERTED BY MESSRS. E. E. GILBERT & SONS, MONTREAL),
AT ST. HELEN'S ISLAND MONTREAL, 29th AUGUST, 1879.

NOTE.—This gun had been previously fired with two five-pound charges R. L. G. powder without projectiles and with one ten pound charge R. L. G. powder, and one ten pound charge pebble powder both with sixty-four pounder common shell. An impression of the whole of the bore was then taken, and on being compared with that taken before firing showed no material alterations.

A detailed report of this trial has been prepared by Major Fraser, B Battery, who was present on the occasion.

Second trial—29th August.

1st Round.—Gun fired with five-pounds charge pebble powder without projectile.

2nd Round.—Gun fired with ten pound charge R. L. G. powder and 64 pounder common shell filled with sand and dust. Gun examined carefully with mirror and spring searcher, no new coil or weld marks apparent.

3rd Round.—Gun fired with 14 pounds pebble powder and 64 pounder common shell as before. Gun examined after firing as before, one slight coil mark developed seven feet three inches from muzzle, "down" to "left of down."

4th Round.—18 pounds pebble powder, projectile as before. On examination with searcher, the coil mark developed in previous round was found to have slightly increased in length. Impression taken of seat of injury which showed that the coil mark had developed half round the bore from R. of D. to L. of D.

5th Round.—21 pounds pebble powder, projectile as before. Gun examined by searcher and mirror, coil mark previously mentioned, evidently longer and deeper, no other mark apparent.

6th Round.—24 pounds pebble powder, projectile as before. Coil mark much larger and deeper. Firing ceased and impression taken of the whole of the bore. This showed that the coil mark had developed round the bore seven feet one inch and a half from muzzle. The mark was widest and deepest in the centre or D. and so far as could be judged, from the impression was at this point at least one-eighth inch deep and one-sixteenth inch wide.

The remainder of the bore shewed only two very slight coil marks near the muzzle, and slight guttering marks in front of the powder chamber.

The large coil mark previously mentioned, is just in front of the B tube, and I do not consider that in its present condition, the gun could be passed as fit for service, without further trial and accurate gauging of the diameter of the bore throughout.

There do not appear to be any accurate instruments for this latter purpose available. It must be remembered that with reference to the above experiments the service proof charges are only two of ten pound R. L. G. powder, and 64 pounder projectile, both of which, so far as regards the appearance of coil marks, this gun has stood successfully.

In this gun the A tube of coiled wrought iron has been purposely made longer than usual and projects thirteen inches from the muzzle.

D. T. IRWIN, Lieut.-Colonel,
Inspector of Artillery.

KINGSTON, 1st September, 1879.

EXTRACT FROM SIR WILLIAM PALLISER'S REPORT ON 64-POUNDER GUNS
AND CONVERTED MORTARS.

The Woolwich 64-pounder gun has only a length of bore of about 16 calibres, so that it is impossible, however it may be overloaded, to give the same velocity as the Canadian gun of 25 calibres. This is a maxim which has been fully proved over and over again at Shoeburyness and in Germany. The reason is, that a large charge of powder composed of rather large grains requires a certain length of bore, in order that it may all be consumed by the time the projectile reaches the mouth of the gun. Should a gun of 25 calibres be loaded with a charge suitable to its length of bore, which in a 6 ft. 3-inch heavy gun would be about 24 lbs. as a battering charge, all the powder would be found to have been consumed on firing the gun. If, on the other hand, the same gun was sent to the shop and cut down to one of 16 calibres, and then loaded as before and fired, a quantity of the powder would be blown out unconsumed.

Thus, if the gun in the first instance was fired at a large target of deal boards 20 yards off, nothing would be seen but the round hole caused by the shot, whereas, if fired under the second conditions, the target would be found studded with little holes from the unconsumed pebble powder, as well as the hole caused by the shot. From this cause the 90-pounder of 25 calibres will give a velocity of 1,800 feet to 2,000 feet a second, and that of 16 calibres about 1,400 feet a second, the charges of powder being the same and with the same weight of shot. It would be very desirable for Canada to make one seven-inch rifled gun—it would be little more than half an inch larger in the bore than the 64-pounder which has just been tested, and Messrs. Gilbert & Sons could make it without difficulty. Colonel Strange has the drawings of 7-inch guns. Their weight of shot would be 120 lbs., and they would be formidable armour piercing guns. They would pierce 8 inches of iron. The 32 pounder converted to 64-pounder rifle, identical with Messrs. Gilbert's gun, has pierced the Warrior target at Shoeburyness, viz.: 4½ inches of iron and 18 inches of teak. The charges for this service were 16 lbs. of R. L. G. powder, and 86 lb. Palliser shot. The same gun afterwards fired five rounds of 25 lbs. of R. L. G. powder and 150 lb. shot, and five rounds, 30 lbs., of R. L. G. powder and 100 lb. shot without injury. Such was the excellence of the coiled wrought-iron barrels that the Ordnance Select Committee who superintended the experiment, enquired whether the barrel was a solid forging. Messrs. Gilbert & Son will be able to make just as good barrels. Colonel Strange was quite justified in putting heavy charges into Messrs. Gilberts' gun; he knew it would not burst, and wished, no doubt, to test the manufacturer's work for the experience and benefit of all concerned. The 90-pounder rifle would pierce six inches of iron.

A converted rifle mortar on the Palliser plan has been tried, and fired with success at Shoeburyness. The success of the system has thus been established; the shells all descended point first. The mortar was a 13-inch smooth bore, and is converted to a 9-inch rifle, firing the service projectiles of that weight. A great advantage is in the use of the service projectile of the rifled guns, as there can be no confusion of stores. Thus, the 13-inch smooth bore mortar converts into a 9-inch rifled mortar, the 10-inch into a 7-inch, and the 8-inch smooth bore mortar into the 6.3-inch mortar. The weight of the shell for the 9-inch rifled mortar is 250 lbs., of the 7-inch, 120 lbs., and of the 6.3-inch, 64 lbs., or 90 lbs. If desired, Messrs. Gilbert & Son could cast mortars for conversion when those in store are finished. The proper mixture of iron would be two-thirds strong grey pig, and one-third white iron. This gives the strong "mottled" iron suitable for gun casings. No doubt, it appears surprising that advantage should not have been taken in England of this cheap and vast supply of formidable weapons when converted, but it must be remembered that the system was not dropped because it was a bad one, but because all the money voted was devoted to the manufacture of Woolwich guns.

(In Continuation of Sir W. Palliser's Memorandum.)

Extracts from that portion of the Report of the Ordnance Select
Committee on Coiled Wrought-Iron Inner Tubes for Ordnance
which relates to the Conversion of Cast-Iron Guns.

WAR OFFICE,
16th March, 1868.

JOHN S. PAKINGTON.

PRESENTED TO BOTH HOUSES OF COMMONS BY COMMAND OF HER MAJESTY.

"Major Palliser is of opinion that the resistance of the cast-iron portion of the gun, to a given longitudinal strain applied internally, is increased by increasing the area that receives it; that the strength of the gun in this respect is not less, but more than it was before it was bored to receive the coil. This strain, according to his views, like the circumferential strain, is principally borne by the interior. The Committee think that there is much probability that this view is correct. To this theoretical ground for confidence is to be added what the Committee regard as ample proof from experiment, that the guns are strong enough for the charges proposed to be used with them; of the many guns lined with coiled tubes, and tested for endurance, only three have failed in point of longitudinal strength, and all of them after standing much larger charges than are proposed."

"No. 207, $\frac{9\text{-inch}}{68\text{-pr.}}$ Completed the first proof series with a charge of 16 lbs., and cylinders increasing in weight every 10th round, from one shot up to 10. It ultimately burst with a charge of 32 lbs., and a cylinder weighing 204 lbs., but not in a way which indicated a deficiency of longitudinal strength.

"No. 220, $\frac{7\text{-inch}}{68\text{-pr.}}$ This gun has been twice lined. The first time in 1873 with a double tube, of which the inner portion was composed of steel tempered in oil, the outer of coiled iron. The steel tube split longitudinally in proof and was cut out. It was re-lined with a double coiled tube of Thorneycroft's iron in 1865. It blew the breach out after 136 rounds, of which 83 were with the full battering charge of a wrought-iron 7-ton gun; but the tube being entire was taken out, plugged again, and inserted into No. 345, in which it was enlarged to a calibre of eight inches, and remains serviceable after the test stated under that number.

"No. 221, $\frac{6.5\text{-inch}}{10\text{-inch}}$ Burst after a proof series, with charge 16 lbs., and cylinders increasing by the weight of one shot every 10th round. The cylinder with which it burst weighed 59½ lbs.

"No. 247, $\frac{7\text{-inch}}{68\text{-pr.}}$ This gun has been twice lined. The first time with a double tube of coiled iron, with which were fired 800 rounds as follows:—

With charge, 12 lbs., shells, 100 lbs.....	20
" 16 lbs. " 100 lbs.....	740
" 20 lbs. " 100 lbs.....	40

800

"It received a new A tube in 1865, and blew the breach out at the 103rd round, of which 53 with the full battering charge of a 7-inch gun; neither No. 220 or 247 had their breach closed in the manner Major

Palliser approves. The tube was taken out like that of No. 220, and has been since inserted in a cast-iron 10-inch gun. The Committee are informed by Major Palliser that this gun has been proved at Elswick with two rounds 30 lbs. charge, and, 180 lbs. cylinders, and is to all appearance uninjured.

Both 220, 241, and 247 were guns which had been condemned in their original state for fissures in the cast-iron round the vent.

"No. 345, $\frac{8\text{-inch}}{10\text{-inch}}$

The interior of this gun, as mentioned above, is the same tube as was previously in No. 220, in which it fired 136 battering charges. It has since fired 77 rounds with shells of 180 lbs. and charges increasing from 12 lbs. to 30 lbs.; 50 rounds with shells of 180 lbs. and charges of 30 lbs.; 35 rounds with shells of 120 lbs. and charges of 22 lbs. In five of the rounds with 22 lbs. charges air spaces of from 10 to 50 inches were purposely left between the cartridges and shell, and four shells, containing $12\frac{1}{2}$ lbs. bursters, were intentionally burst in the bore without any serious effects.

"No. 302A, $\frac{6\cdot3\text{-inch}}{32\text{-pr.}}$

This gun was rejected at proof for certain apparent defects. It was voluntarily offered afterwards by Major Palliser for a trial of endurance. It endured 25 rounds with cylinders of 50 lbs., and charge increasing every fifth round by 5 lbs. at a time from 10 lbs. to 30 lbs.; 25 rounds with cylinders of 100 lbs., charges as before; 20 rounds with cylinder of 150 lbs. In addition to these rounds, which formed a series, it has fired 40 other rounds, viz.: five with 10 lbs. charges and shells of about 64 lbs., 25 rounds with 16 lbs. charges and shells of about 64 lbs., and 10 rounds with 20 lbs. charges and cylinders of 100 lbs., making a total of 111 rounds. In 10 of the rounds fired with 16 lbs. charges, air spaces of from 5 to 25 inches were purposely left between the cartridge and the shot, and five shells, containing $4\frac{1}{2}$ lbs. bursters, were intentionally burst in the bore without any serious effects; the gun was loaded afterwards without difficulty. When the gun burst it was firing a cylinder of 150 lbs. with 30 lbs. of powder. The nature of the burst did not indicate deficiency of longitudinal strength; it split externally, but did not go to pieces.

"No. 351, $\frac{7\cdot0\text{-inch}}{68\text{-pr.}}$ C

Palliser lined gun has fired 100 rounds with full battering charges of 22 lbs. and shot of 115 lbs. It does not exhibit any deficiency of longitudinal strength.*

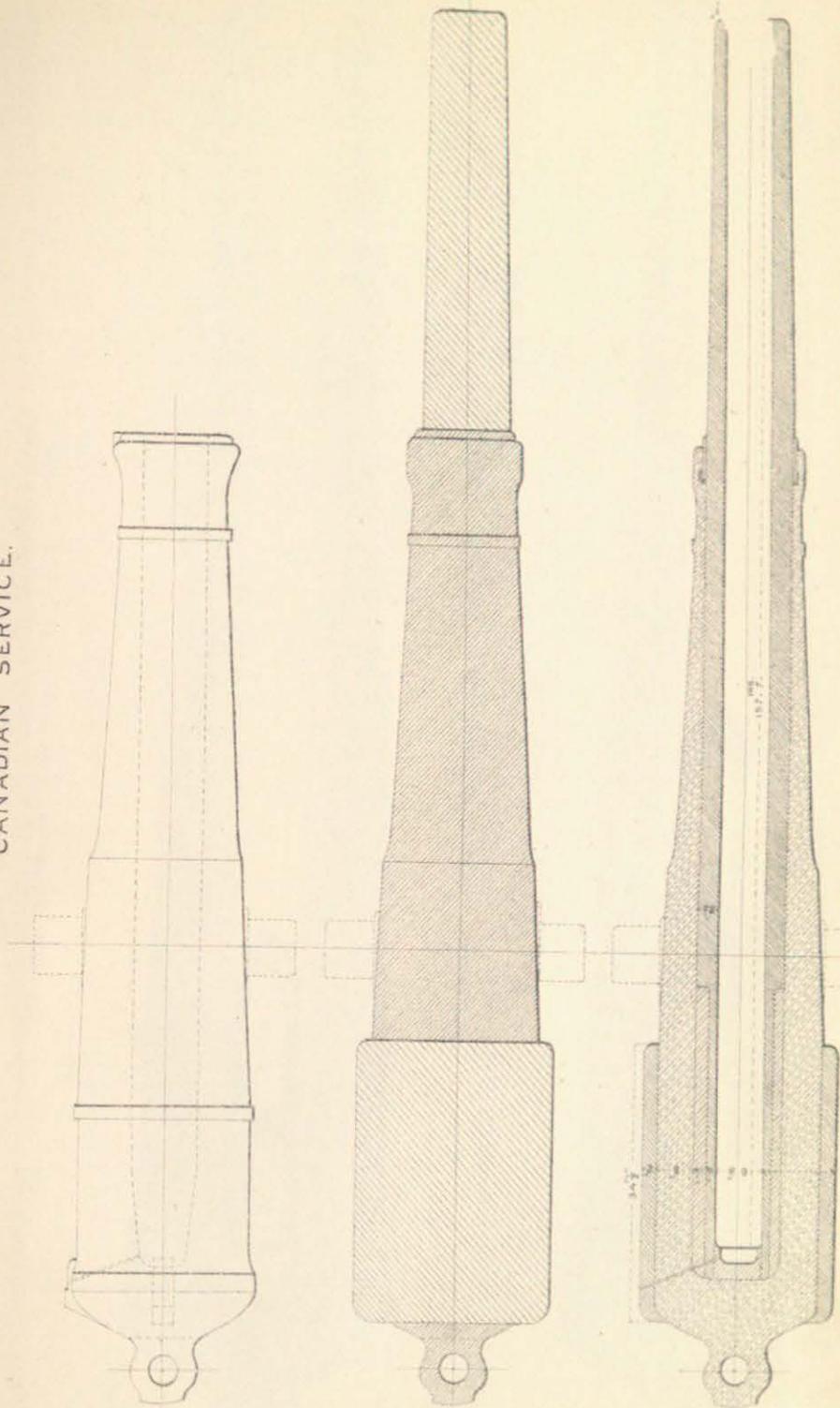
"No. 352, $\frac{8\cdot0\text{-inch}}{68\text{-pr.}}$ D

Palliser lined gun has fired 14 rounds with charges of 30 lbs. and shot of 120 lbs., being more than the original proof charge of the cast-iron gun with the weight of two shot. It does not exhibit any deficiency of longitudinal strength,† in fact, several of the examples here quoted, instead of proving weakness, prove extraordinary strength.

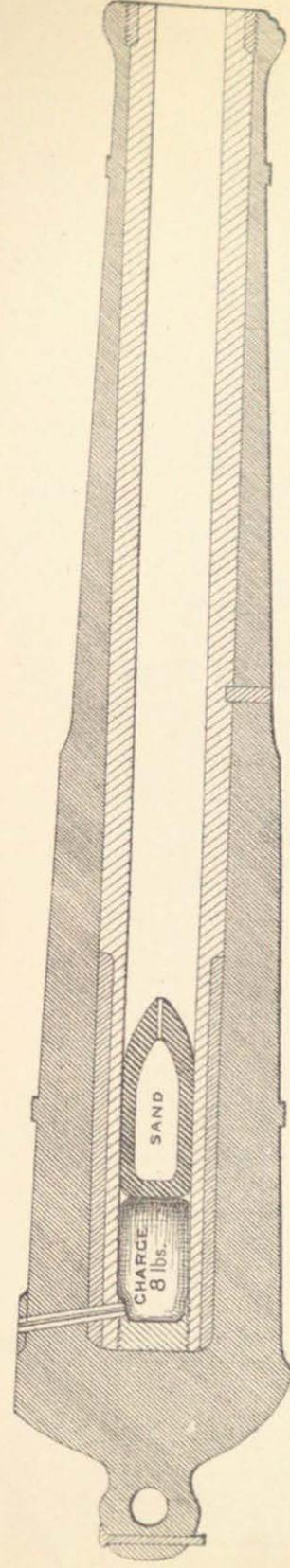
* The number of rounds has since been increased to 134, of which 121 have been with charge of 22 pounds.

† The number of rounds has since been increased to 30 with the same charges.

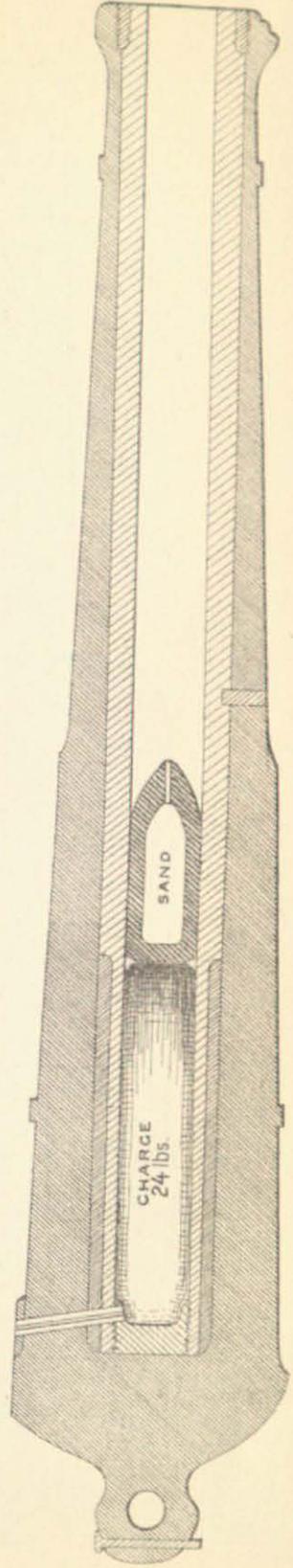
8 IN. GUN CONVERTED INTO A 6.3 IN. RIFLED GUN — 90 PR.
CANADIAN SERVICE.



64 P.R. CANADIAN GUN.
SHOWING LENGTH AND POSITION OF 8^{lb} SERVICE CHARGE.
SECTION.



SHOWING LENGTH AND POSITION OF THE 24^{lb} CHARGE.
RECENTLY FIRED FROM THE GUN CONVERTED BY MESSRS GILBERT & SONS, OF MONTREAL.
SECTION.



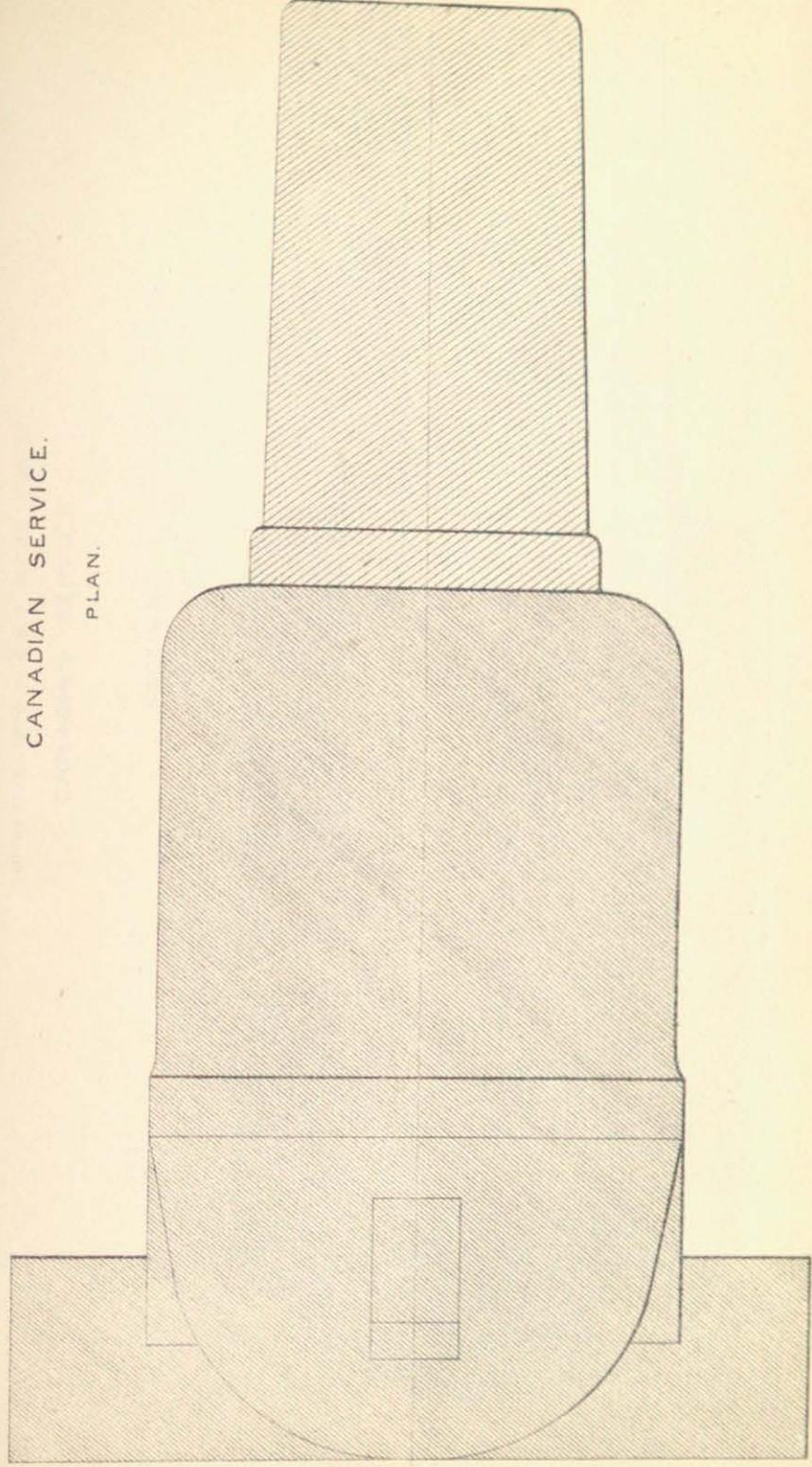
SCALE 1/16"

8 IN LAND SERVICE IRON MORTAR.

CONVERTED INTO A 6.3 IN RIFLED MORTAR.

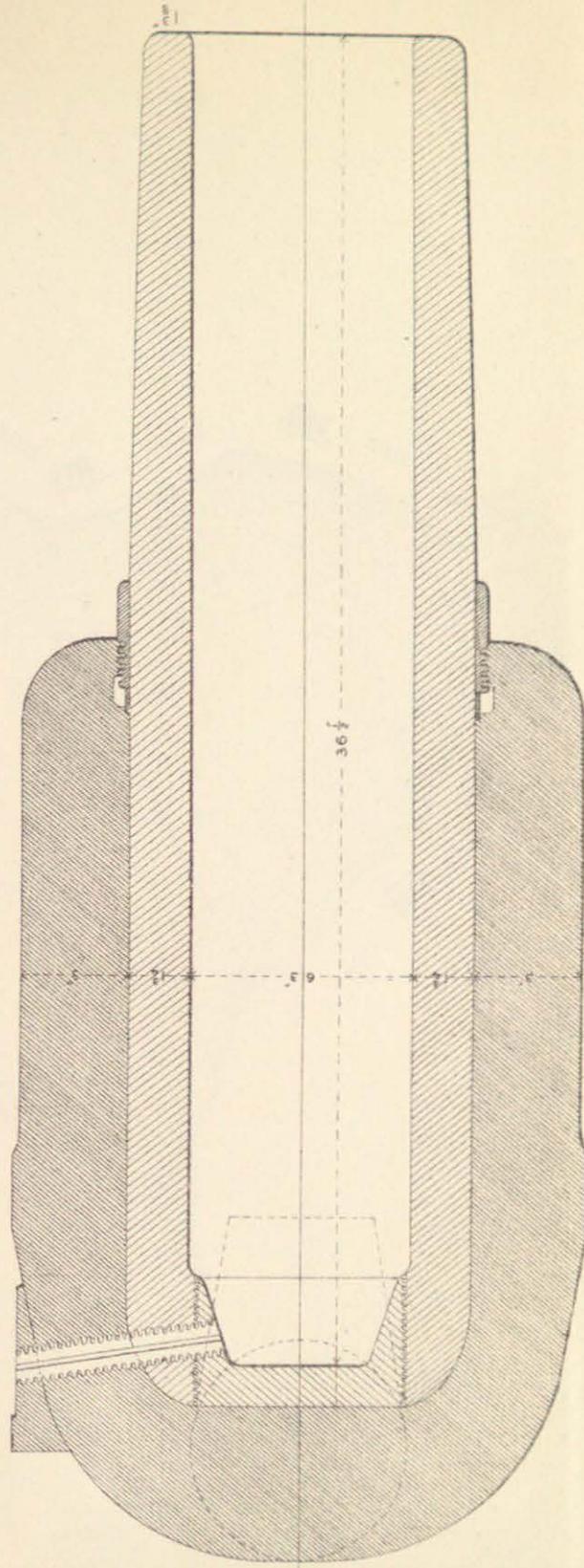
CANADIAN SERVICE.

PLAN.

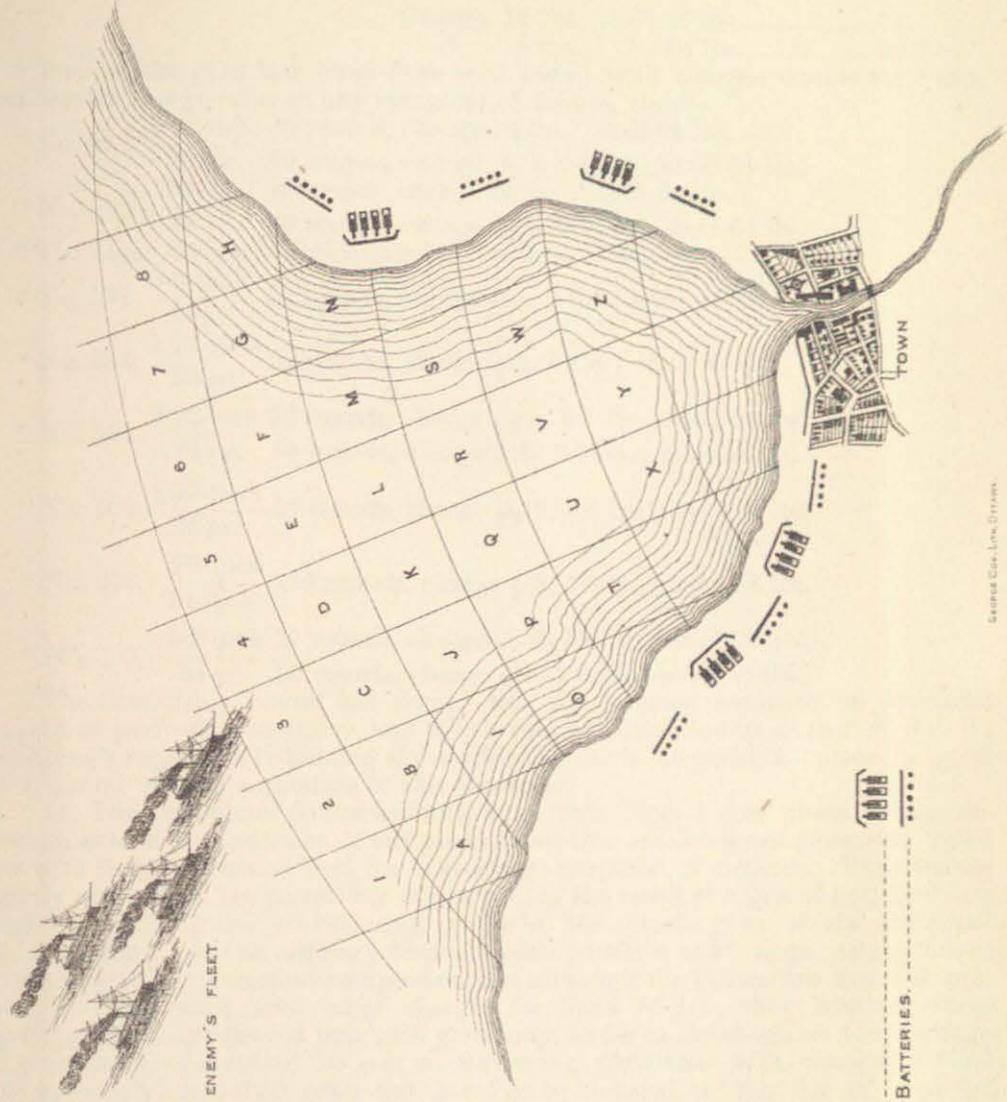


8 IN LAND SERVICE IRON MORTAR.
CONVERTED INTO A 6.3 IN RIFLED MORTAR.
CANADIAN SERVICE.

SECTION.



SECTION
SOUNDING SURFACE
AND SIGHT FROM MOUNTAIN



ENEMY'S FLEET

GUN BATTERIES. -----
RIFLED MORTAR BATTERIES.

" Not numbered, $\frac{6.28\text{-inch}}{32\text{-pr.}}$ This gun is one of 20 ordered by the Government of Victoria, New South Wales, for the armament of the " Nelson " blockship. It was issued to the Committee for the determination of range tables, *Minute* 2298, and has fired 74 rounds, viz. :—

Charge, 16 lbs., shell 86 lbs..... 24
 " 8 lbs. " 64 lbs..... 50

" Two of the guns last lined have been tested with charges double their proposed service charge without any symptom of failure, viz. :—

" No. 303, $\frac{5.72\text{-inch}}{32\text{-pr.}}$ 50 rounds, charge 14 lbs.; shell 64 lbs.
 $\frac{6.3\text{-inch}}{32\text{-pr.}}$ 50 rounds, charge $\frac{1}{10}$ th 6.4 lbs.; shell 64 lbs.

" No. 302B, $\frac{6.3\text{-inch}}{32\text{-pr.}}$ 50 rounds, charge $\frac{1}{10}$ th 6.4 lbs.; shell 64 lbs.

" The other six guns of this supply have fired as follows :—

" No. 301, $\frac{6.3\text{-inch}}{32\text{-pr.}}$ 50 rounds, charge $\frac{1}{8}$ th, 8 lbs.; shell 64 lbs.

" No. 304, $\frac{5.72\text{-inch}}{32\text{-pr.}}$ 50 rounds, charge $\frac{1}{8}$ th, 8 lbs.; shell 64 lbs.

" No. 305, $\frac{5.72\text{-inch}}{24\text{-pr.}}$ 50 rounds, charge $\frac{1}{10}$ th, 5.6 lbs.; shell 56 lbs.
 50 rounds, charge $\frac{1}{8}$ th, 7.0 lbs.; shell 56 lbs.

" No. 306, $\frac{5.72\text{-inch}}{24\text{-pr.}}$ 50 rounds, charge $\frac{1}{10}$ th, 5.6 lbs.; shell 56 lbs.

" No. 307, $\frac{5.2\text{-inch}}{24\text{-inch}}$ 100 rounds, charge $\frac{1}{8}$ th, 7.0 lbs.; shell 56 lbs.

" No. 308, $\frac{5.2\text{-inch}}{24\text{-pr.}}$ 50 rounds, charge $\frac{1}{10}$ th, 5.6 lbs.; shell 56 lbs.
 50 rounds, charge $\frac{1}{8}$ th, 7.0 lbs.; shell 56 lbs.

" The Committee cannot but regard this accumulated evidence of structural strength as perfectly conclusive, and they would call attention to several of Sir W. Armstrong's replies, as indicating the confidence he is disposed to place in good experimental tests in a question of this character.

" 11. The Committee do not hesitate, with these facts before them, to recommend an extensive conversion of our present cast-iron smooth-bored guns into rifled guns with linings of coiled iron, for secondary purposes of defence. Experiments recently made show the possibility of controlling the recoil of a gun of only five tons weight, when firing the full battering charge of the 7-inch guns of six and a half and seven tons, upon an ordinary 68-pr. wooden platform at 5° slope, strengthened and fitted with the American compressor, and although the Committee are not prepared to recommend such large charges for lined 68-prs., they consider these experiments to have proved that such guns may, so far as the shock on the carriage and platform are concerned, be used on traversing platforms with charges beyond those appropriated to shell guns, and therefore be included in the list of guns for conversion, with a view to their employment for harbour defence in India, or by any colonies that may desire so to utilize guns that are already colonial property.

" The natures of cast-iron ordnance then which the Committee recommend as suitable for lining and rifling are the following :—

" 68-prs. of 95 cwt. { to be converted into 7-inch guns, employing the same
 " 10-inch guns of 84 cwt. { charge (14 lbs.) as the six and a half and seven ton guns,
 with common shells, but a smaller battering charge.

" 8-inch 65 cwt., to be converted into a gun of 6.3 inch calibre, with charges $\frac{1}{10}$ th.

" 32-prs. of 63 to 56 cwt., to be converted into 64-pr. shell guns, with charges of $\frac{1}{10}$ th.

" 24-prs. of 50 and 48 cwt., to be converted into 56-pr. shell guns, with charges of $\frac{1}{10}$ th.

J. H. LEFROY,
 Brigadier-General, R.A.,
 President, O.S.C.

"Since the date of this report 9-inch gun No. 293, made with a coiled iron barrel, double at the breech end, with a cast-iron exterior (cast round the tube), has completed 511 rounds, viz.:-

"In a smooth-bored state—

Charge 55 lbs., shot 250 lbs.....	2
" 43 lbs., " 250 lbs.....	18

After rifling—

Charge 55 lbs., shot 250 lbs.....	2
" 45 lbs., " 250 lbs.....	87
" 43 lbs., " 250 lbs.....	402

511

"The tube has split from the muzzle about half its length down, and was in this condition during a large part of the test. The powder used throughout all the tests was R.L.G."

Memorandum.

Eleven years have elapsed since the above recommendation was made, and about 2,000 guns have been converted and passed into the service. They are in constant use, especially for annual practice, by the volunteer artillery. No accident of any kind has occurred with them.—W. PALLISER, November 7, 1879.

9 INCH BREECH-LOADING PALLISER GUN.

CONVERTED FROM THE 9 INCH COMPOUND PALLISER MUZZLE-LOADING GUN, WHICH IN 1868, COMPLETED 500 BATTERING CHARGES OF 43^{lbs} R.L.C. POWDER AND 250^{lbs} PROJECTILES.

SCALE $\frac{1}{16}$ "

FIG 1.

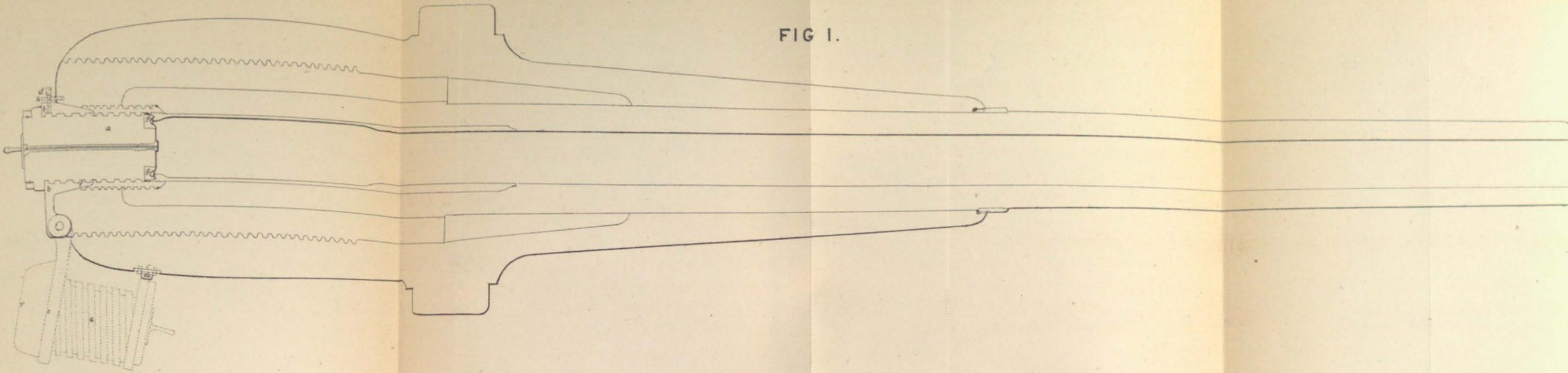
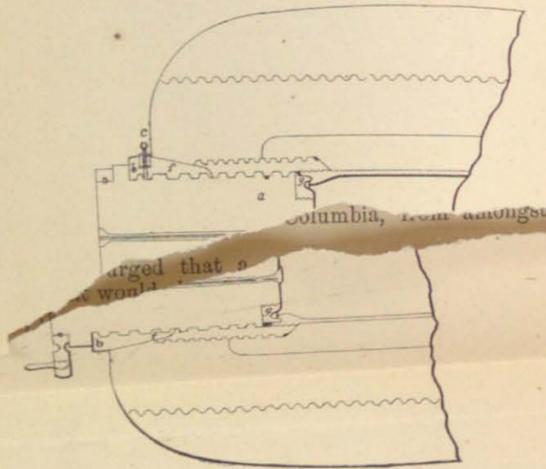
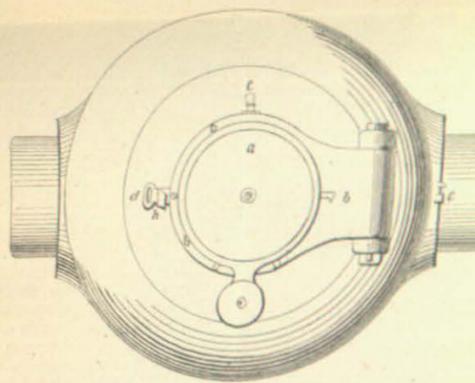


FIG 2.

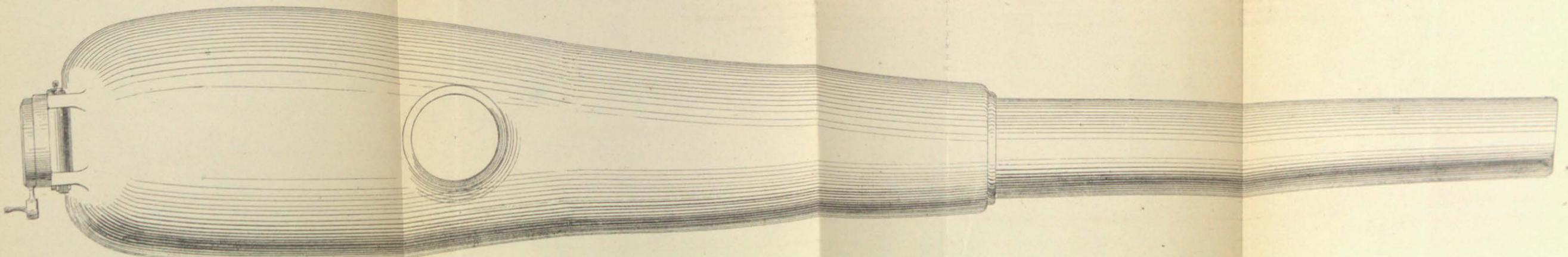


The Breech-Plug *a* (figures 1, 2 and 3) is screwed into a hinged collar or door *b* (figures 1, 2 and 3) by being screwed out of the gun, and swings away from the bore (as shown by the dotted lines, figure 1.) until held steady by the catch *c* (figures 1 and 3). The Screw-Thread is of double pitch. The Handle *d* (figures 1 and 3) locks the hinged collar or breech-door *b* (figures 1, 2 and 3) until the plug *a* (figures 1, 2 and 3) is screwed back the full amount, viz. :—three turns of the screw. The Check-Pin *e* (figures 2 and 3) prevents the breech-plug from being unscrewed beyond three turns. The Handle *d* can then, but only then, be raised, and the breech-door opened, as shown by the dotted lines (figure 1). The act of raising the handle *d* locks the breech-plug *a* and prevents it from being screwed forward again until the breech-door *b* is closed. Thus, as long as the breech is open, the gas-check is retained inside its Protector *f* (figures 1 and 2), and the breech-plug is kept in the exact position for being again screwed up. As soon, however, as the breech-door is shut, the handle *d* becomes free and falls into its catch *h* (figures 1 and 3); the breech-plug is now free to be screwed home by three turns, and the act of screwing it up again, at once, locks the handle in its catch. The Gas-Check *g* (figures 1 and 2) is formed by a copper ring screwed on to the front part of the screw-plug. It could, in the event of becoming injured, be at once screwed off, and a fresh ring be screwed on in its place. It overlaps, externally, the metal of the bore of the gun, and thus its seat in the gun is protected from injury during loading. The gun can be used either as a breech loader or muzzle-loader.

FIG 3.



ELEVATION.



W. Palliser
Oct. 17th 1879

APPENDIX No. 10.

PROPOSITION BY LIEUT.-COLONEL SCOBLE, FOR THE EMPLOYMENT
OF HIS COMPANY OF ENGINEERS TO CONSTRUCT FORTIFICA-
TION AT VANCOUVER ISLAND.

HEAD QUARTERS,
2ND DISTRICT ENGINEER CORPS,
TORONTO, 10th November, 1879.

SIR,—Having in view the probable recommendation of the commission appointed to report upon the defences of British Columbia and Vancouver Island, I have the honour to offer the services of the corps under my command to construct any fortifications that may be considered necessary.

The transport of a company of Royal Engineers to British Columbia would be a matter of considerable time, expense and difficulty. The Imperial Government doubtless would hesitate to ask, and the United States Government would probably deny the passage of a company of regular soldiers across United States Territory to San Francisco, although this would be the most direct and least expensive route. This objection would not apply to the corps under my command, who, as citizen soldiers, could traverse the United States in civilian costume, and resume their military costume at their journey's end. Similarly, their arms and accoutrements could be carried as freight, and nothing need disclose the nature of their errand.

The expense of the transit across the continent from Toronto to San Francisco would be about \$60 (say £12 stg.) per head. From thence to Victoria, Vancouver's Island, about \$20 (say £4 stg.) per head.

The strength and character of the corps might be determined by the character of the works to be erected. It would probably be considered advisable, however, to confine the number to skilled artizans, and, I beg to suggest the following proportion:—

Carpenters.....	21	Coopers	1
Masons	17	Painters.....	6
Bricklayers	20	Tailors	3
Smiths.....	6	Collar makers.....	2
Wheelers	2	Buglers.....	2

or a total of 80. Should this number be reduced, I should suggest the 66 included in the first column. In either case, permission should be given me to recruit up to 80 or 130 on arrival in British Columbia, from amongst a suitable class of the population.

It may be urged that a company of engineers could be raised in British Columbia that would obviate the necessity for transport. It must be remembered, however, that owing to the sparse settlement of the country and the scarcity of skilled artizan labour, and its high rate of wages, it would probably be an impossibility to raise such a corps. Again, were the works to be built by contract or civilian labour, the high rate of wages would more than counterbalance the cost incurred in the transport of a body of men from here.

The rate of pay allowed to Canadian active militia on service is slightly higher than the pay allowed to the Royal Engineers, but much less than the rate of wages which obtain in British Columbia, or even in Ontario. The skilled labour for the work in question could not, therefore, be performed in so economical a manner *in any other way* as by the enlistment of an active militia force for the purpose.

Should immediate necessity arise for the defence of the works when erected or in progress, I beg to remind you that my senior lieutenant and I hold first class certificates from the school of gunnery, and are competent to instruct in the working of guns.

I should propose that the men be enlisted for a year, or for such time as might be necessary for the completion of the works in question, and that on discharge they shall be entitled to the usual land grant to volunteers performing military duty. If desirable, they might form a military settlement in the vicinity of the works themselves so as to be available for defence should occasion arise.

The men of the corps under my command have been instructed in the rudimentary elements of military engineering. I myself and two of my officers are civil engineers.

Trusting that my proposition may be favorably considered,

I have the honor to be, Sir,

Your obedient servant,

THOS. C. SCOBLE, Lieut.-Colonel,

Commanding 2nd District Engineer Corps.

The Lieutenant-General,
Commanding the Militia, Canada,
Ottawa.

APPENDIX No. II.

ROYAL MILITARY COLLEGE OF CANADA—REPORT OF BOARD OF VISITORS FOR 1879.

The Honourable
The Minister of Militia and Defence,
&, &c., &c.,
Ottawa.

HEAD QUARTERS,
OTTAWA, 8th December, 1879.

SIR,—The Board of Visitors appointed by Order of the Governor in Council for duty in connection with the Royal Military College, assembled at Kingston on the 4th instant, and have now the honour to report as follows:—

GENERAL DESCRIPTION OF SITE OF BUILDING.

The Royal Military College is situated on a peninsula of about sixty-five (65) acres, the property of the Government, at Kingston, in the Province of Ontario. At the extremity of the peninsula is Fort Frederick (about eight acres), in charge of "A" Battery of Artillery, and across the water, towards the east (width 500 yards), is Fort Henry, also in charge of the artillery. The communication with Kingston is by a bridge 660 yards long.

The college grounds form two enclosures. Within the inner enclosure (about 34 acres) are situated the cadet barracks, and mess and class building, gymnasium, drill parades, recreation grounds, &c. Within the outer enclosure (about 32 acres), the military engineering grounds, staff quarters, and non-commissioned officers' and servants' quarters.

The cadet barrack building is intended for the accommodation of fifty-nine (59) cadets, quarters for officer employed as staff adjutant and captain of cadets; quarters for one non-commissioned officer; and in the basement, two store rooms and a smoking room for cadets.

The north block, used as an educational building, and mess and hospital premises, is occupied as follows:—Mess premises eleven rooms, hospital nine, class and lecture rooms ten, library and reading rooms three, committee rooms and offices five, store room one, rooms temporarily occupied by fifteen cadets five, professors' room one: total, 45.

All the buildings are lighted with coal oil lamps, of which there are 86 in the cadets' quarters, and 196 in the educational building. The cleaning and maintenance of these lamps entail labour, risk and expense, which would be obviated to a considerable extent by the use of gas.

Owing to distance from the college to the city, it appears a small gasometer would have to be erected on the premises, and the gas be supplied locally. It also appears that gas is necessary in the pursuit of certain studies in chemistry and physics.

The cadets' quarters are heated by hot air from two furnaces in the basement, (not sufficiently), and requiring to be supplemented by one stove on the ground floor and one in the smoking room. The north block is heated by steam from two boilers in the basement. Coal is used as fuel in all the buildings.

Water for the north block is supplied by carts filled at the lake shore close by and for the cadets quarters, by hand pumps from the lake, entailing a great amount of labour. As water pipes are already laid down for both buildings, this would be obviated by the erection of a small forcing pump upon the wharf, which has been constructed for this purpose.

Cadets' Quarters.

Theoretically each cadet should have a separate room, but practically the accommodation does not admit of this most desirable arrangement, and there are now several rooms occupied by two cadets. The Board, however, consider the rooms so occupied to be too small for this purpose.

Cadets are so detailed to rooms on the several flats as to keep the companies, half companies and sections as much as possible together.

Each cadet previous to joining the college is required to pay a contribution of \$200, to cover the value of uniform, boots, personal clothing, books, instruments and apparatus, and in every future year \$150 in advance, for the same purpose. Articles required are issued from the Government stores at cost price. The contribution money is accounted for annually to the cadet. Any surplus is carried to his credit towards his next annual contribution, and any deficit must be paid in addition to his next annual contribution. The cadets are supplied with instruction, board, lodging and attendance, but are required to pay their own personal washing bills. So far the annual contribution has been found ample for the purposes for which made,—indeed, very many cadets have a small balance at their credit at the close of each year.

The room of each cadet is supplied by Government with one military bedstead (iron), bed furniture, two chairs, one chest drawers, one writing table, one washstand, one lamp, one bookshelf, one arm rack, one accoutrement shelf and rack, but each cadet is permitted, if he desires for his own comfort to do so, to procure a strip of carpet to be laid loose beside his bed, a cover for the table, and to place pictures on the walls, provided no injury is done to the quarters. (Many rooms were observed by the Board at their inspection as having these strips of carpet, and as being neatly and tastefully ornamented.)

In class-room each cadet is supplied by the Government with one study desk and stool, one drawing board.

The cadets keep their own arms and accoutrements clean and in proper order, and also make their own beds, these duties being those of soldiers. Cleaning of boots, washing floors and other services of a similar description are performed by the college servants. The rooms are inspected daily by an officer.

All cadets have to be up and dressed at 6.30 a.m. in summer, and 7 a.m. in winter. Lights out (except non-commissioned officers and cadets on guard, who are allowed an extra hour) at 10 p.m.

Baths supplied with hot and cold water are available in the proportion of one to ten cadets. In summer all cadets are compelled to attend swimming parades, but those who are unable to swim are not permitted to enter the water alone.

MESSING.

The Government supply all requisites for messing the cadets, in the form of table furniture, &c., and cooking arrangements. The messman supplies all provisions, cooks, cooking utensils, fuel and light. He is provided with quarters in the building, and receives 49 cents per diem for each cadet present from day to day, for which he provides the following scale of diet:—

Breakfast.

Hot chop, or steak, or sausages, or bacon and eggs, potatoes, bread, white or brown, butter, tea or coffee, milk and brown sugar.

Dinner.

Hot meat, potatoes, vegetables, soup, or pudding, or pie, bread, white or brown, butter, and brown sugar.

Supper.

Cold meat, cheese, bread, butter, tea or coffee, milk and brown sugar.

For all purposes, mustard, vinegar, pepper and salt at each meal. Soup, three times, pudding twice, fruit or preserve pie twice, each week; roast joint, four times, meat pies or stewed meat once, boiled joints twice a week; beef, mutton, lamb, pork and veal, alternately, daily during the season; vegetables to be varied daily; white bread five times, brown bread twice a week; tea and coffee alternate days. Extra articles of messing, such as pickles, potted meats, preserves, preserved vegetables, &c., also temperance drinks, cigars and tobacco, can be obtained from the messman by the cadets at fixed prices, approved by the commandant, but none of these articles can be obtained by any cadet, except upon his own written requisition, specifying his wants. This requisition is delivered to one of the servants, who procures the articles from the messman, who charges the same to the cadet. At the end of each month he makes an account for the commandant, specifying the amount due by each cadet, which has to be paid by him to the captain of cadets, and by the latter to the messman.

The total amount of extras that may be ordered by each cadet during the month is strictly limited, viz. :—

For non-commissioned officers	\$4 00
For cadets.....	2 00

The dining room was visited during the dinner hour; the meal provided was good and substantial, the conduct of the cadets excellent, and the general arrangements showed a satisfactory regard for their comfort. Water was the only beverage allowed.

The Board observe that no intoxicating liquors, including ale or beer, are allowed within the college premises; and whilst thoroughly approving of this restriction, are of opinion, having in view the ages of a large number of the cadets and other circumstances, it would be advisable to sanction the use of ale or beer at dinner by such cadets as may require it, at their own expense, and by permission of their parents.

Amusements.

The library possesses about 778 volumes, and several valuable plans, the whole the property of the Government. The only room available is a very small one, altogether inadequate, being merely a temporary store room for the books in possession. The Library is governed, under the commandant as president, by a committee of staff of college.

The reading room is governed, under the commandant as president, by a committee of military and civil staff and cadets. Periodicals and journals, Canadian, British and foreign, are taken on recommendation of committee after approval by commandant. The reading room is sustained by voluntary subscription of staff and cadets. Entrance—staff, \$2; cadets, \$1. Per term, staff and cadets, \$1; no debts allowed, average number of members 99 per cent.

The recreations in which cadets engage are at present cricket, foot-ball, boating, lawn tennis, gymnastics; average number of members as follows:—Recreation club, 95 per cent, divided as follows: cricketers, 40 per cent.; football, 80 per cent.; lawn tennis, 40 per cent.; boating, 90 per cent.; voluntary gymnastics, 50 per cent.

The clubs are governed, under the commandant as president, by a committee of staff and cadets. The recreation clubs are sustained by voluntary subscription of staff and cadets. Entrance—staff, \$2, cadets, \$1; per term, staff and cadets, \$1; no debts allowed.

A racquet court and bowling alley would be a very desirable addition to provide for exercise within college grounds, especially in winter.

Athletic sports take place annually, and prizes are awarded for distinction gained. Arrangements governed by committee of staff and cadets, and expenses secured by voluntary subscription of staff and cadets, assisted by occasional grant from recreation fund.

The gymnasium and apparatus, which is supplied by Government, is at all times open to cadets when not engaged for compulsory gymnastic squads, and the gymnastic instructor attends for *voluntary* classes on evenings of Wednesday and Saturday.

Gambling of any sort is strictly prohibited, but certain specified games, requiring more skill than chance, and innocent of themselves, are permitted to be played, except on Sundays, in the reading room only. No money or money's worth is to pass directly or indirectly on the result of any game or series of games.

The daily routine of cadets is as follows:—

SUMMER, 15th April to 15th October.

	Monday, Tuesday, Thursday, Friday.	Wednesday.	Saturday.	Sunday.
Reveille.....	6 A.M.....	6 A.M.....	6 A.M.....	6.30 A.M.
Defaulter's Parade..	6.15 to 7.....	6.15 to 7.....	6.15 to 7.....	6.45
Breakfast Parade.....	7.15.....	6.45.....	6.45.....	8.25
Prayers.....	7.20.....	6.50.....	6.50.....	
Breakfast.....	7.30.....	7.....	7.....	8.30
Drill Parade.....	8.30 to 9.30.....	8 to 9.....	8 to 9.....	
Class Parade.....	9.55.....	9.25.....	9.25.....	
Study.....	10 to 12.30 P.M.....	9.30 to 1 P.M.....	9.30 to 1 P.M.....	
Church Parade.....				10.10
Dinner Parade.....	12.55.....	1.25.....	1.25.....	1.25 P.M.
Dinner.....	1.....	1.30.....	1.30.....	1.30
Class Parade.....	1.55.....			
Study.....	2 to 4.....			
Drill Parade.....	4.15 to 5.....			
Defaulter's Parade.....	5.15 to 5.45.....	3 to 3.30.....	3 to 3.30.....	{ 3 P.M. 5 P.M.
Supper Parade.....	5.55.....	6.55.....	6.55.....	5.55
Supper.....	6.....	7.....	7.....	6
Retreat (Sunset).....				
Class Parade.....	6.55.....			
Study.....	7 to 9.....			
Tattoo.....	9.30.....	9.30.....	9.30.....	9.30
Lights out.....	10 P.M.....	10 P.M.....	10 P.M.....	10 P.M.

WINTER, 16th October to 14th April.

	Monday, Tuesday, Thursday, Friday.	Wednesday.	Saturday.	Sunday.
Reveille.....	6.30 A.M.....	6.30 A.M.....	6.30 A.M.....	7 A.M.
Defaulter's Parade.....	6.45 to 7.15.....	6.45 to 7.15.....	6.45 to 7.15.....	7.15
Breakfast Parade.....	7.15.....	7.15.....	7.15.....	8.25
Prayers.....	7.20.....	7.20.....	7.20.....	
Breakfast.....	7.30.....	7.30.....	7.30.....	8.30
Class Parade.....	8.25.....	8.25.....	8.25.....	
Study.....	8.30 to 11.....	8.30 to 12.....	8.30 to 12.....	
Church Parade.....				10.10
Drill Parade.....	11.15 to 12.15 P.M.....	12.15 to 1.15 P.M.....	12.15 to 1.15 P.M.....	
Dinner Parade.....	12.55.....	1.25.....	1.25.....	1.25
Dinner.....	1.....	1.30.....	1.30.....	1.30
Defaulter's Parade.....	1.45 to 2.15.....	3 to 3.30.....	3 to 3.30.....	{ 3 P.M. 5 P.M.
Drill Parade.....	2.30 to 3.15.....			
Class Parade.....	3.25.....			
Study.....	3.30 to 5.30.....			
Retreat (Sunset).....				
Supper Parade.....	5.55.....	5.55.....	5.55.....	5.55
Supper.....	6.....	6.....	6.....	6
Class Parade.....	6.55.....			
Study.....	7 to 9.....			
Tattoo.....	9.30.....	8.30.....	9.30.....	9.30
Lights out.....	10 P.M.....	10 P.M.....	10 P.M.....	10 P.M.

Classes for voluntary subjects are formed on Wednesday and Saturday evenings, two hours each, at which attendance is voluntary.

Cadets.

On the date when the Board visited the college, the cadets numbered 79.

Organization and Discipline.

The commandant is solely responsible for discipline, and for the general superintendence of studies. In his absence the next senior commissioned military officer assumes command.

The cadets are subject to the Mutiny Act and Articles of War, Queen's Regulations, and Militia law and regulations, during their term of four years service.

Punishments.

All punishments awarded are recorded. They are of a military character, and generally similar to those in Her Majesty's regular service, and carry with them the deprivation of a fixed number of conduct marks.

The commandant has power of rustication, and all minor punishment. Cases of expulsion have to be referred through General Officer commanding to Governor in Council.

The staff, military and civil, have power of placing cadets in arrest pending adjudication by commandant, to whom report in writing must be immediately made.

The military staff have power of confining a cadet to barracks for 48 hours, or restricting his leave for seven days, such punishment to be reported immediately to commandant for confirmation.

The civil staff have power of reprimand.