
LECTURES ON THE RIFLE

THREE LECTURES

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BY

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ON

THE RIFLE.

LECTURE I.

On the Rifle, showing the necessity for its introduction as a Universal Infantry Weapon. Delivered at the United Service Institution on the 10th of July, 1857.

MR. CHAIRMAN, GENTLEMEN, AND SOLDIERS,—

I am permitted to address you on the subject of musketry, and I shall,—

1st. Endeavour to show the necessity for the introduction of the rifle, as a universal infantry weapon.

2nd. The mode by which it is now being introduced into the British army.

3rd. The advantages which must ensue therefrom.

4th. I shall advert to some objections urged against it.

Before proceeding, I must pay a tribute to "Brown Bess," and willingly admit that it was a very formidable weapon at very short ranges. Its deadly fire in

close combat, in the Peninsula, at Waterloo, in India and elsewhere, is patent to the world, and honourable testimony has been borne to its merits by those against whom it was directed; nevertheless, partiality must not be suffered to blind us to the defects of our old friend; for with the bayonet fixed, it was the *shortest* gun carried by any European army—the *heaviest*,—fired the *largest* ball and charge of powder,—had the *greatest* recoil,—the *shortest* range,—and, worse than all, the *least accuracy!*

It was folly to attempt to fire with it against small, or at all distant objects; and the British soldier found himself almost powerless when contending against *half-clad savages* or *semi-civilized* enemies. How, then, I may be asked, were our former victories gained? The answer is, so far as British infantry contributed to these glorious results, most nobly did they perform their part, by vanquishing opponents who were armed with muskets *nearly* as bad as their own; they certainly conquered *with* "Brown Bess," not *through* "Brown Bess;" but rather, they earned laurels in spite of it, and I have no doubt whatever but that equal success would have been attained in many instances, had our infantry been armed with a pike, supported by non-combatants in rear, furnished with means to produce a reasonable amount of noise. In fact, the imperturbable steadiness and coolness of the English soldier when under fire, and the calmness with which he waited until the enemy's column approached to within a *very short range*, must have occasioned fearful destruction, and the work was completed by the bayonet and cavalry.

The shooting powers of the English musket, pattern 1842, were tested in a series of experiments undertaken at Chatham in 1846, under Lieut.-Colonel M'Kerlie, Royal Engineers, by order of the Government, whose clear and able report concludes as follows:—"It appears that musketry fire should never be opened beyond 150 yards, and certainly not exceeding 200 yards. At this distance (200 yards) *half* the shots *missed a target eleven feet six inches*, and at 150 yards a *very large* proportion also *missed*. At 75 and 100 every shot struck the target only two feet wide, and had the deviation increased simply as the distance, every shot ought to have struck the target six feet wide at 200 yards; instead of this, however, some were observed to pass several yards to the right and left, some to fall 30 yards short, and others to pass as much beyond, and this deviation increased in a still greater degree, as the range increased. It is only then under peculiar circumstances, such as when it may be desirable to bring fire upon field artillery, *when there are no other means* of replying to it, that it ought ever to be thought of using the musket at such distances as 400 yards." It is an undoubted truth, that the comparative worthlessness of infantry fire was deplored by intelligent officers of all armies. The following extract from "Decker's Three Arms, translated by Major Inigo Jones, Prince Albert's Hussars" (page 14), will show how lowly it was estimated:—"The fire of the line decides *nothing*, and is generally kept up to *employ* the men in the front line, till other troops are brought into *play*." How significant! Had the word "also" been introduced, it would have read thus, "till other troops are also

brought into *play*." Mr. Decker adds, "To make the fire of the line effective, it ought not to commence further than 200 yards at the *outside*, when only *one* shot in *ten* will hit on an average. It is even now and then employed to keep young or bad soldiers *employed*, and to *blunt the idea of danger*. The reason is pitiful; however, a soldier remains with his feelings as a man, but forgets his human weakness in the heat of battle." "Suwarrow, also, knowing the inefficiency of line fire, used to tell his soldiers that three cartridges were enough for each; with one he was to shoot an enemy 30 *yards off;* the second man he was to bayonet; and all the rest would run away."

Hence it seems to be admitted, beyond 80 yards it lost all certainty of hitting a *single* man; at 200 yards it was uncertain even at large bodies; at 300 yards you might shoot all day, at a target eighteen feet square, and *never* strike it *once;* so that a man would be in *perfect security* although fired at from sunrise to sunset, at even a shorter distance than 300 yards provided the firer made a faithful promise *always to aim at him;* but should he take the liberty of aiming 50 yards right or left, above or below, I should then be sorry to answer for the *possible* consequences.

The following extract from "The Rifle and How to Use it," by Hans Busk, M.A., Lieutenant Victoria Rifles, will tend to throw light upon the point in hand (page 18):—"Nothing indeed could have been worse than the weapons supplied to every branch of the service during the Peninsular War, unless it were the want of skill displayed in their use. To give an idea of the miserable deficiencies in both particulars, I may mention,

upon the authority of Colonel Schlimmbach, of the Prussian Artillery, an officer of great experience, whose statistical calculations extend over a long series of engagements during the wars of the First Napoleon, the indisputable fact, that, on the average, a man's own *weight in lead* and *ten* times his *weight in iron* were consumed for each individual placed *hors de combat!*

"At Vittoria, on the morning of the 21st of June, 1813, each British infantry soldier had in his cartouch-box 60 ball-cartridges, altogether 3,000,000 rounds; besides which 1,350,000 rounds more were issued by the field-train to the troops. We will assume that only 3,675,000 were altogether consumed. Now, it is known that, on the side of the enemy, 8,000 out of 90,000 men were killed and wounded; consequently only one musket-shot in 459 took effect; and this calculation excludes entirely from account the injury inflicted by 90 pieces of artillery, each firing 73 shot or shell, or a total of 6,570 rounds. Taking this into consideration, we may readily believe that there was not on that occasion about one musket-ball in 800 which was not utterly thrown away. To show that our infantry of the line so lately as 1851 had not made much progress in the use of 'Brown Bess,' I may add that a patrolling party at the Cape, in the month of August of that year, expended 80,000 ball-cartridges in killing or disabling twenty-five naked savages; just 3,200 rounds to each Caffre!

"General Gassendi estimates that 3,000 cartridges are expended to every man disabled, and which is stated as the proportion at the battle of Salamanca. Decker

fixes the lowest limit at 10,000 for each man. In the military operations of the French against Algiers, in 1830, which closed in fifteen days, 3,000,000 cartridges were consumed, with comparatively little slaughter."

There is a penal island near Sydney, to which convicts from that place either are, or used to be, sent. One of these convicts wanted to escape, so he made a raft, and went off upon it. Now there were always thirty soldiers on guard over these convicts, with loaded muskets. The party commenced firing as soon as the convict was discovered escaping, possibly when he was within fifty yards, and they actually fired one hundred and sixty rounds of ball-cartridge at him, and not one of them hit him; and he coolly and quietly paddled off on his raft.

Favourable accounts of the prowess of cuirassiers in the wars on the Continent and at the battle of Waterloo, induced George IV. to desire their introduction into our cavalry. In consequence, experiments were ordered at Woolwich, to ascertain how far a cuirass would prove beneficial to the dragoon. One of them was placed upon a pole, and fired at from a musket fixed into a rest, of course expecting to settle the point in off-hand style; but, alas! none of the balls could be persuaded to strike the object! I cannot exactly say the balls seemed to have a will or way of their own, as no two went in the same direction—each seemed to have a way of *its* own, and that invariably proved any way but the right or hoped-for one. At last, an officer (Lieut. Millar, R.A.) put "Brown Bess" to his shoulder, and drove a *ball through* the cuirass. From whence I conclude that *the re-introduction* of armour has been limited to the

Household Cavalry, and that only for purposes of parade and pageantry.

Admiral Sir Thomas Maitland informed me of an experiment on a large scale, by order, and in presence of, the late Emperor Nicholas of Russia. There were 10,000 infantry drawn up in regiments, three ranks deep, and a target, six feet in height, and the width of a regiment, was placed opposite to each. They commenced firing at 300 yards, but the targets were not hit; at 200 yards, some little business was done; but not until they marched up to 100 yards, was the execution worth speaking of.

During the Canadian rebellion, in the winter of 1837, a portion of the 32nd Regiment (then stationed at Montreal) was sent, together with artillery, to the village of St. Eustache, where a large body of armed rebels had taken possession of the church, and were prepared obstinately to defend it. Their position, after a time, became untenable, by the church being set on fire; the rebels, flying from the falling building, in considerable numbers, were fired upon by the soldiers (armed with the old flint firelock), at distances varying from 50 to 300 yards, but with very little effect; for though many a fugitive was followed by a complete shower of bullets, he escaped unhurt. There were about 150 soldiers firing, and it is supposed that 100 rebels escaped by threes and fours; many were destroyed in the church, but very few were struck by balls.

The late Caffre war was dragging on for years, making little or no progress. The bill was running up, at one time, at the rate of £3,800 per day, to the evident disgust of John Bull. It was even mooted soberly in

the newspapers, whether the Cape was worth the money. A change of generals was tried, without any improved results. The plain fact is, that disciplined troops, carrying *a gun that could not hit small objects*, are at a discount when attacking savages, possessing the courage and skill of Caffres, fighting in an entangled wilderness, where there are no roads. It is impossible for a civilized soldier, carrying sixty rounds of ball-cartridge, provisions, knapsack, great-coat, blanket, etc., to keep up with, much less overtake, savages who only carry their skins upon their backs, and to whom every tree and rock is a fortress. They require to be hunted like hyenas. If the soldier has not a weapon that will kill small objects, and at *long* ranges, *combined with the necessary skill* to develop it powers, war with them may last for ever. In fact, we can hardly say we conquered the Caffres—rather the war died out—they left off fighting.

It is said the bayonet is the thing for the English soldier, and unquestionably it is a first-rate weapon; but it requires *two* to play at it, and savages can seldom be persuaded to try conclusions at close combat on discovering a nice piece of open country suited for the work.

The experience of the French army in Algeria is in perfect harmony with our own at the Cape. The inefficiency of the smooth-bore musket was shown in the most marked manner by the number of years it occupied our French allies to subdue the native tribes.

Let us inquire who were the men they had to fight against—that is, who were the inhabitants of Algeria? *There are two principal* tribes. First, the Arabs,

those sons of Ishmael, children of the desert, who are soldiers from their youth, and who, upon their fleet horses, were out of range in a moment, and defied pursuit. The other race, who live on the coast, the Kabyles, who are excellent marksmen; for when a young Kabyle is in love with a fair maiden, and asks her hand from her father, the question which the father puts to him is not, what is the amount of his property, but whether he can shoot; and the trial of his skill is to send a bullet through an egg, at a distance which a man can throw a stone—that is probably eighty to one hundred yards.

Now, these were the men the French had to fight, and hard work they found it to conquer them. French soldiers, quietly drinking their coffee at breakfast, were picked off at perhaps 600 or 800 yards. The French found their usual mode of making war would not answer, and they tried many plans before they hit upon the right one. They first tried very light field-pieces, but these they soon found had not speed enough to catch Arabs; and no wonder, seeing that a gun requires a carriage and wheels, and wheels require a road, and turnpike roads are not generally found in the desert; so this plan was abandoned. The next thing they tried was the old-fashioned wall-piece, carried on the shoulders of two soldiers; this they hoped would give them range enough, which no doubt it would, but its defect, like the field-piece, was want of speed. At last, after years of trial, and thought, and severe loss, they hit upon a rifle, and with it they conquered Algeria.

In a pamphlet by Colonel Jacob, Bombay Artillery, *he says*:—"Man has been called a tool-making animal;

and it is a certain mark of advancing civilization, of the progress of mind over matter, of the development and operation of those laws by which the working of the human brain makes the force of one civilized man equal to that of the stalwart limbs of thousands, or even millions, of untaught and ignorant barbarians. To no people on earth have tools and machinery been of more importance than to the English. It has been said that it was the spinning machinery of Arkwright which enabled England so long to stand alone, and successfully, against the world in arms. If such be the value of the tools employed in the arts of peace, those used in war must be even of more consequence. The military art, like all others, can only approach towards perfection by the use of the most perfect tools and machinery attainable. Yet, notwithstanding this certain truth, it is notorious that the inferiority of the arms used by modern English soldiers was, for long, a disgrace to the intelligence of the age, and an outrage on common sense, when compared with the high state of perfection to which the manufacture of arms, as of all other tools and machinery, has been brought in England."

From the foregoing statements, it must be conceded that "Brown Bess" was not an "arm of precision."

Rifles were first introduced into the English army in 1794; the pattern was changed in 1800, and again in 1836.

Until recently we had four Battalions of Rifles, as also Canadian, Ceylon, and Cape Mounted Rifle Regiments; but their weapon (the Brunswick two-grooved), after most extended experiments at Antwerp, in 1844, *was deemed to be the* worst in Europe. The French

had for a long time discontinued rifles in their armies, thinking that the time lost in loading, was not compensated for by their comparatively increased accuracy.

The French army now (1857) include some thousands of chasseurs, armed with rifles; and, I believe, that the expense is the only bar to their universal introduction, as they happen to have in use, and in store, about 700,000 smooth-bore muskets.

Fortunately, we have not our neighbour's difficulty to contend with, as between 200,000 and 300,000 "Brown Besses" were burnt to a cinder one fine morning, with other rubbish and cobwebs, in the Tower of London.

The Russians have many thousands of their infantry armed with a breech-loading long-range rifle. The Russian army is to have fifty-four rifle regiments, with a rifle company to each other regiment of infantry. The Austrians are busy at work, according to their means; the Tyrol has always supplied them with a large number of marksmen. The Belgians are, I believe, universally armed with rifles; and even the little kingdom of Portugal has ordered 28,000 rifles from Belgium. Thus, whether we shall universally arm with a rifle or not, seems to have been settled for us by their adoption into foreign armies, as we must either place ourselves upon an equality as to armament with those against whom we may have to contend, or lie down in the gutter content to allow our enemies to ride over our heads roughshod.

I shall now describe, by way of contrast, the performances of the Enfield rifle. It is two and *a-half pounds* lighter than the old musket, has a

smaller bore, fires a heavier projectile, is stronger, has only ·009 windage, uses only two and a-half drachms of powder, has little or no recoil, and is sighted up to 900 yards; it can be loaded with the celerity of any smooth bore; but possesses an accuracy far beyond that of "Brown Bess" or the Brunswick rifle. An experiment was made at Hythe, in which thirty-five men, skirmishing in marching order, fired thirty rounds each, advancing and retiring at distances between 820 and 550 yards, at two targets, the one fifty yards in rear of the other, each having a frontage of thirty yards, equivalent to thirty-five files; the targets were six feet in height, and the distance between the two was equal to the depth of a battalion in column at quarter distance. There were 617 hits out of the 1050 rounds—the men engaged had to judge their own distance. Had there been six intermediate targets to represent the other companies, it is not too much to suppose that they would have had at least 200 more hits; so that out of the 1050 rounds, about 800 would have told upon the column. On another occasion, thirty men were arranged in skirmishing order, and fired at a group representing a field-piece coming into action (stuffed figures of horses and men of the ordinary size); the firing was stopped at two minutes, when it was found that each man had fired two rounds; when, of the six horses and eleven men, including the three mounted drivers, it was found that the six horses had twenty-two balls in them, and that seven of the men were also struck.

This trial was repeated at 815 yards; five out of the *six horses had sixteen* hits, and six out of the eleven

men had eight balls. At this second trial, the time was extended to three minutes, when it was found that the front rank had fired three rounds, and the rear rank two. Had one rank not waited for the other, but had both fired together, the same execution would in each case have been done in half the time. In volleys at a frontage representing a section of a company (targets six feet high), at 300 yards, ninety per cent. of hits; at 400 yards, seventy-six per cent.; at 600 yards, fifty-two per cent.; and at 800 yards, twenty-five per cent., were obtained by soldiers who had only undergone one course of instruction at the School of Musketry. At individual firing, the results were equally surprising—an officer of the first West India Regiment recently hit the target seven times out of eight consecutive shots, three of which were fired at 850 yards, and five at 900 yards! A target six feet by four feet has been struck four consecutive shots at 700 yards!

But the rifle invented by Mr. Whitworth (and which has been tried at Hythe) as far outstrips the Enfield, as the Enfield does the Brunswick; and experiments are now (1857) in progress at Woolwich, to see how far it may prove suitable for a military arm, and more fully to test its merits.

Opinions are more or less valuable according to circumstances, but facts are stubborn things; and, if killing your adversary be any test of a gun, there cannot be much difficulty in determining the comparative merits of any arm. The Whitworth will fire better at 800 yards than the Enfield at 500. Beyond 1100 yards, the Enfield must "cease firing," even at large masses, while *Whitworth's* can do business at 2000! Indeed, rifling

seems to be in its infancy, and range must only stop with the powers of the human eye to take an aim. Breech-loading rifles have also been invented, from which there is not the slightest escape of gas, and which can fire ten rounds in one minute. The continuance of their fire will only be restrained by the exhaustion of their ammunition, or the rifle becoming too hot to hold.

Allow me to read an extract from a recent number of the *Times* as follows:—"What is a rifleman? He is simply an infantry soldier, equipped with a fire-arm, and therefore differs nothing upon a first presumption from any other soldier in the line. But his equipment differs in quality, if not in kind. His weapon is constructed especially for long and accurate shots, and he is trained to manœuvres, teaching him how to improve every advantage of ground or position which he can find. That in these respects he may be better than an ordinary soldier is very true; but why need the ordinary soldier be left in this position of inferiority? Why should not every soldier in the line be provided with a firelock as good as can be manufactured, and taught to use it as cleverly as a sharp-shooter? A rifleman, after all, is nothing more than a musketeer, armed with a musket which will kill, and one musket ought to do this as well as another. Take a parallel from times long past, when the favourite weapon with the Englishman was the bow. We do not read in those days of any company of archers provided with particularly good bows or arrows, or expected to shoot with particular accuracy.

"Every man had as good a weapon as could be found, *and endeavoured to* use it as well as his neighbour. If

in an army of 100,000 musketeers, 10,000 can hit the mark, while the others cannot, they become of course a corps of peculiar utility; but their superiority would vanish when the other 90,000 became marksmen of equal merit. If the rifle or effective musket—for the rifle is nothing else—were ill adapted to general service, it would be another matter; and, as every man alike carries a fire-arm as his weapon, there can be no reason why one should not be as well equipped and as well trained as another; why, the greatest available efficiency should not be imparted *to all*. In our opinion, it is better to make every soldier in the army a good shot, than to assume that most of them will be bad ones, and provide special battalions for compensating the defect. In this respect, every battalion should be special, and to such an end we hope our own organization is now bending."

I confess that I entirely concur in the sentiments contained in the foregoing quotation, and happily our rulers have determined that every British soldier shall be "special," and a rifleman. Thus, having the kernel, we need not trouble ourselves about the shell—so that, whether some regiments shall have short rifles and long swords, to interfere with their running, or longer rifles and short bayonets, does not much matter. If, for "auld lang syne," the most conspicuous colour, viz., black, be preferred by some, let them wear it. Riflemen can only be made such by teaching; they are not born shots, though some learn quicker than others. In the English army, a soldier cannot be made to serve in any regiment contrary to his own will; and to extract the good shots from one regiment, and place them in another, *vice* an equal number, whose only fault was that they

could not shoot, would not be submitted to very gracefully by the colonel. Happily, no English colonel will ever be called upon to command a *weeded* regiment.

Thus, I trust, I have shown the necessity for the introduction of the rifle as a universal infantry weapon:—first, from the insufficiency of the old musket; secondly, because foreign armies are largely introducing it; thirdly, from the astonishing powers of the rifle in the hands of a taught soldier.

Secondly. Before proceeding to show the mode by which the rifle is now being introduced into the British army, I shall briefly refer to the manner in which firing was taught hitherto; and here, strange as it may sound, although the name "musketeer" implies a soldier, who destroys his enemies by firing out of a musket, and sticking with a bayonet—yet how to perform these with the greatest effect were the very two things he was never taught. Being placed in position to commence firing, or to charge, the soldier was left to his own resources; virtually, in firing, he shut his eyes, opened his mouth, threw his head back, and pulled the trigger; and, as if this was not bad enough, he was sometimes exhorted to "Aim low!"—an almost certain mode to ensure their balls flying over the heads of their opponents, as any ball will *ricochet* at the same angle with which it strikes the ground. There was a thing called "ball practice;" it was looked upon by all parties as a bore—hurried through as a form, almost universally, as there were but very few bright exceptions, being the infinitesimal minority of officers, who thought their men *were intended* to hit when they fired off balls! How *can anything be* practised which has not been previously

taught? Hence our ball practice was, in most cases, little better than a farce, and if the calico target did not look sufficiently satisfactory to be carried in triumph into the barrack-yard, the drummer well knew that he had only to drive a few holes through it with his drumstick, to make it "all right."

It is true that the *Infantry Manual* contained many valuable instructions for firing, and had they been complied with, firing would certainly have been much better than it was, but these were almost a dead letter for want of detail; while, it must be admitted, that, from the wretchedness of the gun, it would not have repaid the trouble of teaching. Our new gun requires a new man; as Colonel Jacob says, "a skilled workman, not a pipe-clay automaton."

With this view, the late Lord Hardinge, who introduced the Enfield rifle, established, in 1853, a normal school of musketry at Hythe, in order to qualify the soldier to use it. Detachments of different regiments are sent to that establishment to go through a course of training, which occupies about ten weeks, in order that each regiment may be supplied with a qualified officer and non-commissioned officer instructor in musketry. The instruction is divided into theoretical and practical, the latter into drill and practice. The object of theory is to give the *reasons* for everything that the soldier may be afterwards called upon to perform in practice; and it is taught by lectures, diagrams, models, and by catechizing. There are four drills (now 1860, eight drills), viz., cleaning of arms, target-drill, judging of distance drill, and the manufacture of cartridges; target-drill being divided into aiming and position drill. The

most minute attention is paid to each individual soldier, and he is taught to fire in drill; balls being afterwards used in practice merely as a test of the soldier's proficiency. A man cannot be made to hit a mark against his will; in fact, he fires with his brains, the eye and finger being merely servants of the mind. To succeed or to excel, there must be love in the heart and knowledge in the head; but no man can be interested in that which he cannot understand. Hence, each soldier is made to comprehend the laws which influence the bullet in its flight, and how to apply this knowledge to practice. He is led to think, and his moral character is found to be improved and elevated thereby. He becomes conscious of his increased efficiency and value; he is raised from a mere machine—a trigger-puller—a thrower away of fire—and, after instruction, is not merely a good, but an intelligent shot. It has been satisfactorily proved that taught soldiers beat untaught officers, but taught officers will excel taught soldiers. A regiment, on the old system, never improved, year after year, in firing ball, while a taught regiment fires better every succeeding year. Sportsmen are generally beaten by taught men; to their annoyance and surprise they cannot hit an iron target, but refer to their performances at bogs in Ireland, or jungles in India. The officers are put through precisely the same amount of drill and practice as the private soldier, each snapping caps, firing 20 rounds of blank, and 110 rounds of ball; in individual firing, file and volley firing, and skirmishing, in which they are exercised as soldiers; but in addition (being attached to *sections and* classes, where they act as officers) they are *taught how to teach.* A series of lectures, eight in num-

ber, is delivered and explained to them, upon which, and upon the whole course of instruction, they are catechized and examined in presence of the commandant, at the expiration of the term, preparatory to the receiving certificates. The eight lectures treat of the theory of gunnery, the history of small arms, the history, manufacture, and explosive force of gunpowder; of these each officer is required to take a copy. Thus, in every regiment of the line, it is intended that there should be at least one intelligent officer, possessing a fund of most important information connected with the efficiency of a rifle regiment, and to whom is entrusted the duty of aiding his commanding officer in furthering the efficiency of his regiment, by instructing the officers and men in the theory and practice of musketry. I trust I have sufficiently pointed out the mode by which the rifle is being introduced into the British service.

Thirdly. As to the results which must ensue, actual and varied warfare can alone fully demonstrate the consequences of war carried on with such amazingly increased powers of destruction placed in the hands of infantry, who have ever been numerically the strongest portion of modern armies, and it will depend upon the talent of commanders to avail themselves fully of these powers. Unquestionably the whole system of tactics and fortifications must undergo important modifications from the altered relative value of artillery, cavalry, and infantry. I shall not presume to dictate how our new infantry shall be best employed, but I can state what their powers will be. My duties lead me to deal with units, whose value becoming increased in proportion to *the amount* of instruction, we arrive at sections, com-

panies, regiments, brigades, and divisions, until the whole infantry of our army can shoot at long ranges. Should two rival armies take up their position at a very short distance, and choose to take issue with the bayonet, in this case a pike might answer all purposes even as well as a musket, much less a rifle. But the long-range rifle will tend to keep armies at a more respectable distance. Unquestionably, in all the minor operations of war, in desultory warfare, in the defence of posts and field-works, in clearing out embrasures (matelets and gabions being fired through), the lines of defence in permanent works being lengthened, infantry rendered less dependent for support upon artillery, advancing columns and field batteries being reached at 1000 yards, and thus be for a long time under destructive fire; in all these cases the rifle will play a most important part. A taught regiment of 800 men could throw 16,000 bullets in ten minutes into a fort of an area of fifty square yards, at a distance of 900 yards; and this could be done over the heads of a column advancing to storm. With such startling facts, showing that important changes must take place owing to the increased efficiency of infantry, one cannot but be surprised at the silly, indeed the almost rancorous spirit of controversy, with which the introduction of the rifle is attempted to be opposed. One might be led to suppose, that in treating of the powers of our weapon we are longing for a tilt against our artillery brothers on Woolwich Common, while all the time we are only thinking of making short work with our Queen's enemies. Every patriot cannot but rejoice on finding *that there are improved* means of securing the duration

of peace, by curtailing the evils of war, whether it be by improving the sabres or lances of our dragoons, the ships and armament of our navy, the guns of our artillery, or by the rifles of our infantry and marines.

It is well that each branch of our service should be "well up" to what is going on in the others; and as foreign nations are "wide awake," our artillery and dragoons may as well "look out for squalls," for they may safely anticipate a "brush" with long-range accurately shooting infantry. It is too late to deny facts; and to "go ahead" is doubtless the order of the day with each and all of us.

The English army must ever be a small one; our object therefore should be, to make up by efficiency for what we want in numbers. While no expense should be spared in perfecting our arms and ammunition; so, also, too much pains cannot be taken to qualify the soldier effectively to use his improved weapons, ever remembering that the good gun is worse than useless in the hands of an untaught man. It is right to have a sufficient supply of first-rate rifles in store, but if we trust to them for safety, not knowing where to find intelligent men to develop their powers, we are leaning upon a broken reed. It is not to the weapon, but to the user of it, we must trust for the protection of our throne, our altars, and our hearths! Was it English *bows* that gained immortal honour for English infantry at Cressy, at Poictiers, and at Agincourt? No, it was English *bowmen*. Were *slings* from the Balearic Islands better than those made at Rome? No, but the *slingers* were. John Bull consoles himself by knowing that "wooden *walls*" surround his "sea-girt isle;" but for myself, my

gratulation increases when I hear about the "hearts of oak" to stand behind those walls. Some weeks since our friend John was assured that there should be no needless call upon his pocket, as the "line" was pared down to the anti-war standard, but that there should be lots of rifles in the stores, and large numbers of militia (at their ploughs), who at the end of three weeks could be made perfect soldiers. If by a soldier is meant a man in red, who can march without treading down the shoe-heels of one in front, well and good; but if you mean to convey the idea of one *skilled in the use of a rifle*, perhaps three years would be nearer the mark. The maximum of efficiency, with the minimum of instruction, could be best got out of a pike—a weapon one stage ahead of the broomstick, and the one I would recommend to be placed in the hands of your "three weeks' men." Although my opinion, as to the consequences which must ensue from the introduction of the rifle, can have no weight, I am fortunate in being enabled to refer you to the opinion of officers of artillery. Colonel Jacob, to whom I have before alluded, writes:—

"Judging from our practice, it seems certain that two good riflemen so armed could in ten minutes annihilate the best field battery of artillery now existing. . . . The army which should first adopt these weapons would thereby obtain an advantage equal to that of the exclusive possession of fire-arms a century ago. One effect of these would be, that the whole of our field artillery would become totally useless. . . . Train and arm the men worthy of their noble nature, and 50,000 *such* soldiers *would be* a match for a world in arms. . . . Any *numbers or mere* masses of semi-barbarous enemies, ay,

or of *ordinary* soldiers, would be powerless against such foes. Cavalry would become of little use against *such* infantry, and our present artillery absolutely useless against them. With open files and ranks, each man a skilful combatant, but still all acting in perfect concert, as would be easy with such brave, trusty, intelligent, and skilful men, they would sweep their enemies from the earth, themselves almost unseen; while a single discharge from a company at 1000 yards' distance would annihilate the best field battery now existing. The value of individual skill and practice would be immensely greater than under the present (1855) system. No amount of mere 'food for powder' could successfully oppose even a small force so armed; opposition to the English soldier would become as impertinent on land as it has been said to be, by a celebrated French author, to our seamen on the ocean. With *such* infantry *so armed*, our artillery must be abolished or improved."

I shall now read to you a few extracts from a work, entitled *Constitution Militaire de la France*, written by Paixhan, a General of French Artillery, and translated into English by Major-General Brereton, Royal Artillery. "Napoleon has said that the musket is the best warlike machine invented by man; what would he have said if he had seen the new arm? What the consequence of this change will be, is become of importance to examine. At 600 metres the enemy's case shot will scarcely range, and his round shot will only hit a group of two or three men six times out of 100 rounds, but at that distance our infantry can make every shot tell upon the vast group of men and horses in action with a gun. *The enemy's* artillery must soon be silenced. Thus on

both sides, if a battery of artillery be placed in line, and in advance, and if a company of light infantry be placed in front of it, there will probably be a complete extinction of fire of artillery. No doubt the cannon will always retain its superiority in penetrating deeply into the heads of columns, in clearing obstacles, and in acting at considerable distances; but the fire of light infantry will have a terrible effect upon field batteries; and a swarm of light infantry upon the whole line, firing with such exactness, what will not be its effect upon an enemy's troops, upon its masses, and upon its officers, who will be selected as objects by the most practised of the marksmen? Doubtless, the more effectual an arm has been rendered, *the more skilful should be the man who is to use it.* Thus this new arm—a French invention—will not only be favourable to France, but also to all defence against attack; it will be in favour of the weak against the powerful; favourable to independence, to the rights, to the peace, and the dearest interests of every nation. Now that the musket has been rendered capable of striking a group of two or three men six times out of 100 rounds, at a distance of a quarter of a league, and that at 200 metres every shot takes effect, it is evident that constant firing, and more especially the meeting of line against line, column against column, will become less frequent—that a change will take place in battles and manœuvres."

I trust, gentlemen, from what I have now stated and read, that you are satisfied that most important alterations and consequences must ensue from the adoption of the rifle musket as a universal infantry arm, *bearing in mind that* those intelligent artillery officers,

when they wrote, were entirely ignorant of the vastly increased powers of the Whitworth rifle.

Fourthly. I shall now notice some of the objections which have been used against the rifle as a universal infantry weapon. Although it is only six years since the introduction of the Minié, and four since the Enfield, much of the outcry and many of the objections have died out; and indeed they were most of them so puerile, as hardly to deserve the time taken to repeat them; to answer many of them would be worse than waste of paper. "Rats and mice were to eat the grease of our cartridges." "The hole made in a man's body by the bullet would be too small!" "The soldiers would forget to reverse their cartridges from excess of funk!" "They would not be able to judge the distance of the objects!" "Courage would vanish by firing at long ranges," (*ergo*, the rifles and artillery must be cowards *par excellence*). "Squatting on the heel would spoil a man for charging." "Position drill would make a battalion shaky under arms." It is in *print* that infantry soldiers were never intended to *play* at "long bowls;" it is not their business to shoot men a long way off!! They must not poach on the manor of a man dressed in blue with scarlet facings; and, until recently, it was not lawful for a man dressed in scarlet with blue facings, to shoot an enemy, unless with a bullet of spherical form, weight one ounce, powder four and a-half drachms, and the projectile must "not be a compound," but be made of lead only! "The rifle is too delicate, and not fit to be put into the hands of a *common soldier*," wilfully forgetting that that master-mind, the late Lord Hardinge, who placed the Enfield

rifle in the soldier's hands, also established the school of musketry, that he might be qualified to use the best gun which has ever been supplied in such large numbers to any army that ever trod the earth; and every Briton owes a deep debt of gratitude to that great man, who, ahead of his generation, ardently longed that before he died, the English soldier should carry *the best gun that could be made*. But, gentlemen, we do not intend to have a "common soldier;" and I need only point you to the gallery, crowded with infantry soldiers of the Guards, to prove that our men can be interested in their profession and are willing to be instructed. Let no one dare reproach a soldier with being "common" or ignorant, until he himself shall have used every exertion in his power to enlighten and to make him uncommon. Perhaps he is more ready to learn than we to teach. By calling the rifle "delicate," an aspersion is cast upon the character and judgment of Lord Hardinge, who decided that it was entirely suitable for military purposes. If I knew what was meant by the word "delicate," as applied to the rifle, I should be glad to answer the objection. If fragile or weak is meant, I have authority for stating that, although lighter, it is in reality stronger than "Brown Bess." Perhaps delicacy may refer to the construction or use of the sights. I can only say that I have witnessed the firing of hundreds of thousands of ball cartridges, by all sorts of men, and have never seen but *one* injured, and that so very slightly, that its use was not interfered with. It is foretold that the infantry soldier will be too much alarmed from the fire of artillery, to use his sight;

but permit me to remind this objector, that artillery can only fire with accuracy from being a judge of the distance, and then by using a sight; and that they are equally subject to fright, being the recipients of a shower of leaden hail, while pouring forth their thunder. A back-sight is quite a proper thing for a *large* gun, fired by a man in blue, but wholly unsuitable for a *small* gun, and beyond the care and capacity of his brother in yellow facings! This is almost too absurd! A chronometer is, I believe, a most delicate instrument, but I never yet heard that it is too delicate for a sailor. The promised advantages are said to be "overdrawn;" and a wise man recently wrote in the *Times* that this was proved by the few Russian dragoons who were unhorsed by the rifles of the 93rd regiment at Balaclava. Now, a *taught* soldier is not in the least surprised on account of total failure; but his astonishment would rather have been called forth had the results been different. Would a gold pen, value 15*s*., write when placed in the hands of little Tommy Hodge, he never having been previously instructed in the formation of "pot-hooks and hangers?"

Mr. Chairman, Gentlemen, and Soldiers, I shall trespass upon your time no longer. Permit me to thank you for the patience and fortitude with which you have endured my long range skirmishing. I fully believe there is a glorious door open for British infantry. I trust that our comrades who have recently gone to India have had some measure of rifle instruction, and that they may give a taste of the Queen's lead to those demons in human form who have eaten the Queen's salt. May the number of officers who are pursuing the

army as a profession be daily on the increase, and largely predominate over those who endure it as a calling. May our gracious Sovereign have always at her disposal 100,000 adepts in the use of the rifle; and, under the fostering care of our Royal Commander-in-chief, may British infantry become as renowned for skill as they have ever been for valour; and may they reap wreaths of laurels with their bullets, to intertwine with those which they have gathered with their bayonets!

LECTURE II.

On the Qualifications necessary to Enable the Soldier efficiently to Use Modern Fire-arms. Delivered at the United Service Institution on Friday, the 28th May, 1858.

GENTLEMEN,—

The object of my addressing you to-day is to point out the qualifications which are necessary to enable a soldier efficiently to use highly improved modern fire-arms. These qualifications may be divided into two main ones, viz., he must have skill to hit objects at long ranges, with knowledge sufficient to determine the distance of those objects, in order to apply his skill.

I shall first endeavour to show how these two qualifications may be communicated, and then I will answer objections which have been urged. I may premise, that there must be certain physical qualifications, *i.e.*, a man should have a sound mind, and a healthy body; and his eye, of course, must *not* be defective.

I hold that all ordinary men *may* be taught all *ordinary* things; and, therefore, that a man *can* be taught to shoot. Whence come our skilled artizans? Are they *born* skilled? Can ploughing be *taught*? Can gamekeepers *shoot? Do* gamekeepers *learn* to shoot, or are they born

shots? Stock your preserves well, will there be any lack of poachers who can shoot? A knowledge of shooting will be acquired fast enough *when* there is a commensurate motive for its attainment. It is very true that I cannot plough, not from any inherent difficulties in ploughing, but I have never been taught. But I can shoot, because I have been taught. Ploughmen cannot shoot, not from any difficulty in shooting, but they have never been taught. And hence, I maintain, that all *ordinary* men can learn all *ordinary* things. It is not pretended that all men learn with equal facility, or in the same length of time; much less, that every man can by training be made a marksman. Unquestionably there must be a natural aptitude for certain things, in order to attain excellence. What is meant by a "good shoot," is a soldier who gets into the first-class; and he who obtains seven points and upwards in the first-class, and possesses a knowledge of the flight of the bullet, etc., etc., is called a "marksman," and as such is a claimant for superior rate of pay. Of the officers who undergo *one* course of instruction at Hythe, about one-third get into the first-class, and about one-half of these become marksmen.

I now come to the mode in which we communicate this power and knowledge, premising that for purposes of musketry instruction, the soldiers are divided into squads of not more than *ten* in each.

In the first place, I must inform you, we do not address our pupils as soldiers, but as *men*. We know that the brain and the mind are the rudder of a man; that a man does, in fact, and in truth, shoot with his mind, his bodily members being merely the servants of *that mind, i.e., when they are brought* into subjection to it.

We teach first by theory, because a soldier is a being with a mind, and by theory we give him the *reasons* for everything he may afterwards be called upon to perform in practice. I believe it to have been a lamentable error, that hitherto, in giving such an amount of instruction as was attempted, we addressed our men as soldiers, instead of appealing to them as beings with *reflecting minds*. We have called upon them to perform certain drills, without telling them the design of them. Interest and *enlist the mind* of a soldier, and then you will have the whole man obedient to your instruction. We deliver lectures on theoretical subjects, illustrate them by diagrams and by models, and thus endeavour to elicit thought. We catechize on these topics, and by these means we essay to make a soldier an *intelligent* shot. We are not satisfied with a man merely being a *good* shot. It is not enough that a man is able to hit his mark or to miss it; he must know *why* he hits or misses. We explain to the soldier the construction of his barrel, and that from its peculiar form it has a certain amount of elevation in itself. We inform him of the laws which influence the bullet in its flight through the air; and that, in consequence of those laws, if he were to direct the axis of his piece straight upon any object, he would never strike the *very point* at which it was directed, even at the distance of a yard! We convince him of this truth, and thereby show him the absolute necessity for elevation; and if I were asked to point out the difference between the instruction in shooting of the present day, and the teaching (if deserving the name, for I cannot exactly say there was none) *of former days*, it would be summed up in one word—

elevation! Hence we show him how elevation is derived, and the necessity for it.

The next topic we speak of is "aiming." It is necessary that the soldier should have a distinct view of the object he wishes to strike—that he should be capable of forming an alignment from his eye, through the bottom of the notch of his back-sight, to the tip of the fore-sight, and the object. It appears that just in proportion to the impression made on his brain, so is his power to strike. If I were to take out a soldier on a cloudy, dull day, and place him 500 yards from a figure dressed in a brown great-coat, with a dark background, then give him twenty rounds, and let him fire, and count the number of hits; and afterwards, if I were to take the same man out on a clear day, and let the object be dressed in a white smock-frock, placed in front of a black background, he would assuredly hit the stuffed figure many more times than he did on the previous occasion. He has not become a better shot, but he now has received a clearer impression on his brain, which has enabled him to hit his object more frequently. This admits of easy proof, by having a telescope so fitted on a rifle, that aim can be taken through it, when the object will be more frequently struck.

Again, the difficulty of shooting consists, not in merely taking an aim (which may be and is always taught), but no man living can retain an aim; and the accuracy of shooting consists in firing *when you have the aim*. Hence, most judiciously, we never use the word "fire" to the infantry soldier—there is no such word in all our instructions—because *you* cannot tell a man *when to fire. It is* a transaction between his own mind and

finger. A man receives the word of command from his own brain, and just in proportion to the promptitude of that *mental* word of command, will be the accuracy of the shot. A person who can fire remarkably well at short, frequently cannot hit at long distances. He has no misgivings when to press the trigger at short distances, but has at long ranges, because, in the latter case, a more vague impression of the object is made upon the brain. Hence, a very important part of the soldier's instruction is "eye drill," for the eye, like the brain, is as capable of being strengthened as a man's arms or legs.

We teach "aiming drill" by the aid of tripods and sand-bags, on which the rifle is placed, and then by taking aim at a mark; and this is done at seventeen distances (three daily), 50 yards apart, from 100 to 900 yards. There are dozens of men who at *first* cannot aim, they have not the power of forming a correct line with the eye, the sights, and the object, because the organ has never been *thus* exercised; but aiming can be and is taught by "aiming drill."

The next drill is what we call "position drill," and in it we include all those parts of the platoon exercise which affect the destination of the bullet. The soldier is placed in, and *habituated* to, the best position for independent firing, as if *actually firing ball*, minute attention being paid to every motion. The object of "position drill" is to establish an instantaneous connection between his eye and finger.

If I had been asked four years ago if it were likely I should shoot, I should have said "no," and probably *have given* many reasons for my not doing so; but none

of them, I have since discovered, would have been of any moment. But had I been told, "you will not fire because you cannot press a trigger when you choose, as there is no union between your brain and finger," I should have doubted, if not denied this statement. But it is a most extraordinary fact, that the great majority of men cannot press a trigger when they like, or when they ought; but miss, because they try, by retaining the aim, to make sure of it; they do not act upon the first impression, and then fire too late, and miss the object. By snapping continually at spots on a wall, and at targets at various distances, men learn to squeeze the trigger at the peculiar juncture of time that is necessary; and persons who are well taught come to this point—that when they fire they know where the ball will go; if they miss, they know why; they feel that they pulled at the wrong time, and that the finger did not obey the mind—it is his property, but it is not subdued, it is not broken in. On remarking to a soldier that his ball has fallen very short, he will sometimes reply, "I never meant to pull the trigger, but it went off;" and he thinks he has a kind of right to a new cartridge. The error of most men is, they cannot make it go off soon enough. A simple illustration of aiming may be witnessed on board a man-of-war; there you cannot retain an aim if the ship is in motion, the sailor must pull at the right time, *i.e.*, when he has got the aim; the man waits for the lurch of the ship, and he tries to pull at the right time; at any other than the *very time* at which the man pulled he would have missed. It is precisely the same with the soldier and *his gun, he must press* the trigger at the exact moment.

We thus teach shooting, without firing ball, by

aiming at spots on a wall, and also at objects of the same size, and at the distances at which the practices are performed, while training the finger to work in unison with the eye. In "position drill," it is important that the trigger be pressed without the slightest jerk, and with the motion of the forefinger only, no aid being derived from the hand or arm, the eye being fixed upon the mark during and *after* firing, as if it were prolonging the intention.

We use bullets merely to ascertain if the men have profited by their teaching, or to ascertain how they have been taught. We recently had four regiments at Shornecliffe; we knew which would shoot the best, because we knew which had the best teacher; we know how a regiment will shoot, when we know the merits of the person who has been giving them instruction.

Each recruit in the British army fires 110 rounds of ball in the first year, and other soldiers 90, and the third class shots fire every winter, after receiving extra preliminary instruction, in order that every soldier may succeed in getting out of the third class. It is not, however, the number of balls that make him shoot better, but because every fresh supply of balls has been preceded by a fresh amount of instruction. The more balls you give him the worse he will shoot, unless you give him intermediate training; and each annual course of firing of the old soldiers is always preceded by a course of "preliminary drills." I am happy to say that the system of instruction takes deep root with our soldiers, they see the sense and the reason of it. It raises the importance and value of the man in his own estimation, *and in an honourable* way. He feels himself to be a

man of some consequence, that he can do something, and the result is, we have arrived at such a nice point, that the greatest punishment you could inflict upon a soldier at Hythe, would be to tell him, "You shall not learn your duty; you shall not come into the lecture-room, nor go forth to shoot." The class from which soldiers are taken is fully sensible of the advantages to be derived from the mode in which we proceed. They acquiesce in it, they set their shoulders and their seal of approval to it, and the greatest delight of our men is to learn this most important part of their profession. As to the fruits of this system, they can only be proved by facts. I trust I need go no further than to say, that his Royal Highness the Duke of Cambridge has seen our soldiers firing at Hythe, has heard them catechized on theoretical subjects, and has expressed his approbation in the strongest terms. He has been present at the examination of officers in the theory of projectiles, the history of small arms, and the history, manufacture, and explosive force of gunpowder. He has witnessed their firing, which is superior to that of their men, and highly encouraged and applauded them for having acquired the power of teaching by example.

General Sir John Burgoyne, an officer who would be an ornament to any army, was down upon our beach a short time ago. We had a figure on our target the size of a dragoon on horseback, namely, eight feet six inches in height. We had a party of sixteen files of men, marching in open column of sections, left in front; they were ordered to form line to the left, and to fire *volleys by sections* from left to right, at a distance of *600 yards; each* section put, on an average, from four

to five bullets in man or horse at each discharge; so that before a staff-officer could pull down a spy-glass from his eye, four files would put about two balls in the man and three in the horse. Sir John Burgoyne remarked, "No cavalry or artillery can ever stand upon an open plain before you." These were men who had only received one course of instruction at Hythe, and it shows, I trust, that efficiency may be communicated. That firing is *wholly a matter of teaching* may also be proved in this way: there has never yet been a regiment that fires as well as the detachments do at Hythe, because the men at Hythe are *better taught;* and thus it ought to be. Nevertheless, in a short time, no doubt, the regiments of the line will equal and beat the detachments at Hythe, because they will have gone through *repeated courses of instruction* and practice. In only one practice the soldiers always beat the officers, viz., "file and volley firing," because the former are steadier in the ranks; they have more confidence in one another—the result of drill in the ranks. If I were to refer to documents or statements which reach me from abroad, I could occupy hours. People talk of the "withering Enfield rifle," "the deadly Enfield rifle," etc., and yet the men who use those rifles are not *half* taught. The truth is, that its capabilities have never yet been fully developed. The rifle has not yet been long enough in the hands of the British army to have a *thoroughly well-trained* regiment. I read of a striking circumstance which occurred in India with the force under Colonel Franks. The enemy had guns in position, and thought that (according to the old English fashion) we would "take the bull by the horns;" this

talented commander preferred conquering by *mind*, so he drew out his *ordinary* infantry, armed with the Enfield, at 600 yards, and silenced their guns in three minutes and a-half, and then advanced to the attack. Were a similar position to have been attacked in former days, the infantry would have had to be quiet till we had silenced their guns by ours, *before* we dared to advance; but with the new arm, infantry, in some cases, can shut up artillery for themselves. I trust the day may arrive when we shall have infantry soldiers silencing batteries *by withdrawing*, and thus avail themselves of their vertical fire at long ranges. We have been told that some soldiers are too old to learn to shoot. We have had nearly all the sergeant-majors of the army at Hythe, and a detachment of them positively beat the boys; the whole of *them* had at least attained their prime, and had reached what is called "a certain time of life." Their age was no obstacle however, they excelled the lads. There are some few men, who, after the usual course of drill, and firing sixty rounds of ball cartridge, cannot get out of the third class. We take these men and give them extra instruction, and the result is, that *we hardly ever have a man left in the third class*. It is not our object to have a few men who can shoot, but we want *every* English soldier to shoot. The test of shooting is at long ranges; a man or gun may shoot very well at 100 yards, but try him at 800 or 900 yards, can he shoot well then?

To fire accurately in windy weather requires specific training, wind being air in motion. There is much the *same difference* between wind and air as there is in a *running stream* and stagnant water. If you wish to

row across a stream, you must not steer straight at the landing-place, but make due allowance for the current. Hence, when the wind blows from the right, the bullet will be carried to the left, and vice versa; and in these cases aim must be taken to the right or left, in proportion to the strength of the wind and the length of range. When the wind is from the front, the range will be shortened, hence the sliding-bar must be raised; and when from the rear its tendency is to carry the bullet higher, to allow for which the sliding-bar must be lowered; not that the wind in such cases propels the ball, but the projectile retains its velocity longer, meeting with less resistance while separating the particles of air. Our rifles are sighted to fire 530 grains of lead, with two and a-half drachms of dry powder, through air. Suppose aim taken direct at an object, and the ball to be carried ten feet to the left; it would then be necessary, after first forming a correct alignment upon the mark, to carry the fore-sight ten feet *horizontally* to the right; but this is by no means an easy operation, as in so doing the correct elevation may be lost. In fact, the great difficulty of firing at long ranges, is owing to the prevalence of wind, as it is only in calm weather that aim can be taken direct at the object; in short, we are compelled to aim at nothing in order to hit a definite object, and to do this requires much judgment, practice, and skill.

I hope you are satisfied that shooting may be taught (as anything else), and may be acquired by all ordinary men.

My next topic is "judging distances," in order that *the soldier* "may apply his skill." The theory of judg-

ing distances is this: we take our men out to accustom them to make observations upon the different signs and appearances of objects and figures at various *known* distances, in order that they may have a record of facts in their own brain, whereby they may determine the distance of other objects. It is the brain that is concerned. We place men at known distances as points, the first at 50 yards, the next at 100 yards, another at 150, and so on, up to 600 yards. The soldier is told to observe the man at 50 yards, and to register in his mind all particulars concerning his appearance. His attention is called to the fact that at 50 yards off, he could name any man in his own regiment, as there is at this distance complete identification, for the age, complexion, height, and figure of any man can be determined. We next place the pupil in front of the man at 100 yards, and call him to notice those parts which he can *still* perceive at this distance, and those which he can *no longer* perceive. Thus we proceed up to 600 yards, when it will be observed that at certain distances men appear to have no eyes, or necks, the head looks like a ball upon the shoulders, which are then never square, but sloped off; flesh is not visible, etc., etc.

The objects are then placed at unknown distances, in order to test the knowledge acquired. Some persons may be slow to admit the possibility of such a course of drill succeeding; but, let me ask you, are there any men or people who can judge distances? I answer, yes, savages! When a savage wants to fire from a bow, *though* he may not know the meaning of the *word* "elevation," *or* anything of the laws of gravitation, which

necessitate it, he knows that he must give his arrow an elevation suited to the *distance* of his object. His life —his very existence—depends upon his knowledge of judging distances, and his adroitness in applying that knowledge. He has received certain impressions in his own mind, which enable him so to direct his arrow as to destroy his adversary, or supply himself with food. I believe that the *same faculties* are latent, more or less, in *all men*. Those possessed by the savage are also possessed by the civilized man; but in the latter, some of them have never been called forth. Without the appliances of civilization, civilized men are frequently worse off than savages. When placed on a desert island, or amongst savages, he is altogether at a discount; he has, as it were, lost his crutches. Possibly, he cannot light a fire, boil a kettle, perhaps even thread a needle to mend his own clothes. You ask a Caffre, "what footstep is that?" and he tells you "it is that of a cow in calf, made three weeks or a month ago." Ask me; but I cannot tell you, for I know nothing of footprints, as I always walk upon a hard road or pavement if possible. Ask him what o'clock it is? and he looks at the sky, and tells you. Inquire of me, and I reply, "I forgot to wind up my watch last night." I had a brother in India who never carried a watch, and yet he could tell you the hour as well as a native. Thus powers are called into exercise in the wild man, which are undeveloped or dormant in us. He does not get his dinner till he kills it. Suppose I were without the pale of butchers, and were to have no dinner till I could tell the distance of a bullock; no fear I should very soon become a tolerably good judge of distances. We are

certain this knowledge may be acquired, and therefore teach our men. Registers are kept by which we create a spirit of emulation. Those who cannot judge with a certain amount of accuracy up to 300 yards, remain in the third class; those who cannot to 600 yards, remain in the second class; but those who judge with accuracy from 100 up to 600 yards, get into the first class; and prizes to the best shots are only given to men in the first class of judging distances, and such as are otherwise generally intelligent. To show you the thing can be done, I may just tell you, that out of 107 officers at Hythe, 90 got into the first class, 17 into the second, and none were left in the third; that is to say, that out of 100 officers, 84 per cent. could judge distances between 100 and 1000 yards. Again, out of 595 soldiers, taken indiscriminately, 473 got into the first class, 107 into the second, and 15 remained in the third class; the average being 84 per cent. of officers against 79 per cent. of men. This, of course, was only from one short course of instruction.

However, although it is a necessary qualification of a soldier, and very desirable that he should have the power of determining the distances of objects, in order to adjust the sights of the rifle correctly, yet it is very satisfactory to know that we are not absolutely dependent upon every soldier knowing the *exact* distance of an object; for, from the lowness of our trajectory, and the course our balls take, we are, *to a certain extent*, rendered independent. For instance, in firing at an object 100 yards off, with an Enfield rifle, supposing the height of the shoulder to be four feet six inches, and *the object aimed* at three feet above the ground, in this

case, should the soldier know nothing of distance, provided the man is not more than 195 yards off, he could not miss some part of him. If close, he would of course strike him four feet six inches above the level of the ground; suppose he turns out to be 195 yards, then he would break his shins.

The culminating point of a bullet is about half way, or rather more. With the 200 yards' sight, the greatest height of the ball will be about five feet four inches when it has proceeded about 100 yards, and its first graze will be about 280 yards; hence, if the rifle be only held straight, some part of a man must be struck, higher or lower, for the whole distance of 280 yards, provided he be five feet four inches in height. It is true we have lately been receiving "men" five feet three inches! and one such at 100 yards would have the ball pass one inch over the crown of his head, so that, unless he wore high heels, or that aim be taken one inch below his "centre of figure," he would escape destruction.

With the elevation for 300 yards, the greatest height of the ball is about seven feet from the ground, and its first graze at about 370 yards. We are taught that the height of a dragoon on horseback is eight feet six inches, let us, therefore, adjust our sight for 300 yards. Calmly suffer your enemies to approach within the 370 yards, as you then have a dragoon under the power of your gun from that distance until he reaches its muzzle. Admitting that you are no judge of distances—I'll suppose that you cannot tell whether they are 1 yard, or 370 from you, what then? the fact is, you cannot miss *them; such is* the flatness of our trajectory, and such

the weapon the English soldier carries, that the death warrant of those dragoons is signed. Fire only *one* volley! they have breathed their last! they will be no more seen for ever!

At Hythe, a few days ago, an officer of the 34th regiment, who was at the unhappy business at Cawnpore, told me, that "upon one occasion, some of the enemy's cavalry came round the flank, and took by surprise a small party of my men, who were skirmishing; they immediately formed 'rallying square;' the horsemen 'turned tail,' and my men delivered our volley, when both dragoons and horses fell to the ground like a wall, every man but one bit the dust; a soldier came to the front, levelled at the fellow, and knocked him off his horse."

With the elevation for 300 yards, the ball is about six feet from the ground when it has proceeded about 225 yards; thus, until its first graze of 370 yards, infantry are under the command of our rifle for 145 yards. So much for teaching the soldier theory.

I have made these statements not to undervalue the importance of acquiring the tact of judging distances, or to make soldiers careless or indifferent in their efforts to acquire a knowledge of this most important qualification, but rather to show that highly improved modern fire-arms may be placed in the hands of our men, and do wonderful execution, although they may not possess that perfect knowledge of the distance of the object, without which, as some persons *most erroneously suppose*, the powers of the rifle cannot be *developed*.

I heard a most interesting account from Colonel

Maude, of the 3rd regiment, who, when lying wounded in the Redan, was addressed by a sergeant (I think of the 90th regiment) as follows:—"Sir, do you see that scoundrel bayonetting an Englishman?" at the same time bringing his rifle to the "present," knocked the Russian over. He remained beside Colonel Maude for some time, and said he had despatched no less than sixteen Russians. He stated to the Colonel, "I am, sir, separated from my regiment; but I hope, if we ever get out of this, that you will speak for me, and say that I did good service." They did get out; he was spoken of, and he now holds his commission. This proves what can be done with coolness, courage, and *skill*. Was he better than other men? *Yes; he was taught*. He said to Colonel Maude, "I have been at Hythe, sir." Gentlemen, he had calmness, coolness, presence of mind, and skill. Hence, you see what may be done by an instructed soldier.

I trust you are satisfied that men of the class from which soldiers are taken can be taught to use the rifle efficiently at long ranges. Of course I cannot go into details. I cannot prove it to you here; but come down to Hythe, and we will be glad to show it to you practically; I speak from experience; and now as to facts. We have had 2000 men and 400 officers under instruction at Hythe in the last three years, and we certainly have improved their value and efficiency amazingly. I am quite aware that sentiments and opinions are held by many opposed to those which I entertain. I must add that Hythe does not profess in two months to make every man who goes there a good shot, or a perfect *judge of distances*; but to place each soldier and officer

in a fair way of learning to become such himself, and of aiding in the instruction of others.

I shall now endeavour to answer sundry objections. We are cautioned not to "expect too much." It is admitted the rifle is a wonderful weapon—it is acknowledged that a good gun is better than a bad one—that a gun should shoot; not go off, but hit.

In a Lecture given in this theatre by Colonel Dixon, he seems to have been impressed with the idea, that although the rifle was capable of still further improvements, and that the best arm, combining every advantage, has yet to be constructed; nevertheless, he stated that the question was reduced to rather narrower limits than may at first sight appear, when "*the class of men into whose hands*" the arm is placed, is considered.

Suppose we direct our attention to agricultural implements. A mechanic is trying to improve a plough; would you check him by saying, "That is all very fine, but consider the clown into whose hands it is to be placed?" Are you not rather solicitous to get the best possible plough, and afterwards to qualify men to use it? Can any agricultural instrument be too good? Are we to be so wedded to any particular kind of arm, that we should not try to improve it, and seek to qualify the soldier to use it? Can any horse be too good for a dragoon? Can any gun be too good for an infantry soldier?

Again, it is said, the rifle is "very delicate." But what is intended by this word "delicate?" Now the only difference necessarily subsisting between the rifle and common musket is, that the former has a moveable *back-sight, and grooves* on the interior surface of the

barrel, and to one or other, or both, the idea of being fragile or *delicate* must, I presume, be intended to apply. I have seen hundreds of thousands of rounds of ball cartridge fired, and I never saw but *one* accident to the back-sight, and which was of so trifling a nature as in no wise to impede its use. If delicacy be meant to apply to the grooves of our rifles, they were the fourteen thousandth parts of an inch, of uniform depth; but now they are gradually reduced in depth at the muzzle to five thousandth parts of an inch; and are thus made shallower than the thinnest sheet of paper. This has, in my opinion, deteriorated the value of the rifle as a military arm, as the continual friction of the ramrod will tend to efface the very shallow grooves, and convert the rifle into a smooth bore at the muzzle.

It is said by some, What is the use of soldiers being able to shoot so far off? Our soldiers are not intended to "play at long bowls." All I can say is, we do not mean them to "play" at anything; but do not oblige us to carry a gun that cannot shoot—a gun indeed that was never meant to hit anybody—one that was never designed to shoot save at masses, at *short* ranges. It is conceded that the soldier may *now* "fire at 400 yards." Why not 500? Why not 700, or 900? It is a remarkable fact, that 500 years ago, when British infantry used the bow and arrow, which gave them such triumphs in the time of Edward III., they never shot for practice or amusement at less than 200 yards! If any man in England, civilian or soldier, in those days, fired an arrow at less than 200 yards, he was liable to be *punished for* it. British infantry then armed with

the bow, had far more accuracy, more celerity (firing twelve arrows in a minute), and longer range (they shot to 600 yards), than the infantry of Europe had at the commencement of this century! And had it not been that a ball fired by gunpowder penetrated armour, I doubt whether we should ever have had a fire-arm. It is said that "you will throw away your ammunition at 'long ranges;'" but I am supposing highly trained soldiers, acting under intelligent officers, that the soldiers know what the weapon will do, and the commanding officer understands *when* to call forth the skill of his men. I am aware it was once the cry, that the bayonet was the thing for the English soldier. To be sure it *was, because the gun would not shoot;* it would in those days have been folly to trust to your balls; and you can bayonet *now* to *your* heart's content, *if* your enemy will only be persuaded to bayonet *with* you.

We are told that ammunition "is expensive;" it costs one halfpenny a round. I hardly like to repeat what I heard at Woolwich as the cost of one shell; it was twenty-five guineas! This would supply a good many cartridges. No doubt we are willing to use a great deal of ammunition, but the only question is, can we give you value received for it?

The opinion has been thus expressed, that men cannot be taught to judge distances: "I mention this, as no doubt it may gain the attention of those who have the duty of instructors of musketry, and who have before this found out how difficult, nay, *almost impossible*, it is to teach men to judge distances with anything like sufficient accuracy." My experience in musketry *instruction has* led me to conclusions of an entirely

opposite character, and I can only infer, that the officer making this statement never saw the system undertaken in the proper way. So far from being almost impossible, *it is perfectly possible.*

It is admitted that you may perhaps instruct "marksmen," or teach "rifle corps," or "flank companies;" but, after all, the former are only men dressed in green, instead of red, while the latter are selected on account of their height and activity, and *not for their brains.* There is no speciality in the British army, but that which is communicated *after you catch the men.* The soldiers of the Royal Engineers are an exception, because many of them are mechanics, and derived from a class who have received a better education. But we all go to the same market for our "raw material;" and if there be any speciality in the British army, it must be communicated *after the men have enlisted.* Let every energy be exerted to improve the gun; and let me tell you, that the worse the soldier is, in a peculiar sense, I maintain, the better his gun ought to be. Improve his gun, do not say that bad guns are good enough for such inferior men; but rather, *because* he is an ordinary man, *give him a better gun.* I believe the best gun at present to be the Whitworth rifle; but let the manufacturers of fire-arms devote all their energies to improve the *soldier's* rifle by lowering the trajectory, and thus make him a more deadly adversary to the Queen's enemies.

What are the two grand requirements for a soldier's gun? They are celerity of loading, or the power of firing a great number of rounds in a given time, combined with accuracy at long ranges? I may say it is mainly by having a low trajectory. For instance, if,

with the Enfield rifle, I can hit the target half-a-dozen times running at 600 yards, and strike it but once out of six at 900 yards, I am equally satisfied; my ball at 600 yards being only twenty feet high at its culminating point, whereas at 900, it is about fifty feet high, and it has in the latter case to be dropped, as it were, almost *on* the target, and which is of course very difficult. Give me a rifle much lower in its trajectory, when it could be struck as easily at 900 yards as at 600 yards. This is the whole secret, and any *taught* soldier in the British army is competent to determine the best gun to carry. Why is it that one gun has a lower trajectory than another? Because the bullet travels the distance in a shorter time, and therefore requires less elevation to counteract the effects of gravity, which acts by time. The weight of lead and charge of powder being retained, the course of a projectile can be lowered by reducing the diameter of the bore; its velocity and power of penetration is thus increased, as lessening the frontage of the ball causes it to experience less resistance from the air, and therefore it travels faster and further.

I believe there is nothing too good for the British soldier, he being *taught* how to use it. If the thing is fragile or inappropriate, of course it is absurd to give it to him; but strength may be combined with accuracy and rapidity of loading.

Mr. Boucher, in a lecture delivered in this Institution, condemned the Minié Expansion System, and "the mistaken notions it has unhappily engendered," and said that he can "prove by the aid of experimental *facts that the Minié* system is a fallacy." I have,

however, declined to enter into a discussion on the subject. I felt no good would result from it, for who could act as umpire, to decide between us? But we have one happy way of getting out of our difficulties. If any man professes to have discovered a wonderful gun, *it is very easy to put his theories to a practical test.* There have been no end of patents taken out for breech-loading and other guns within the last few years—one thousand for improvements in small arms, and I believe about three hundred for breech-loaders; and each one of these thirteen hundred inventors can prove to you, *to his own satisfaction*, that his is a perfect and most invaluable invention. There was a Swiss officer sent to Hythe by the founder of our school, the late lamented Lord Hardinge, who professed to have a superior rifle to the Enfield. He fired and missed the target, eighteen feet square, thirty-two consecutive shots at 800 yards! while the English rifle, firing under the same conditions, struck the target twenty-two successive shots! If the mean absolute deviation, or shooting of a gun be ascertained, together with the angle of elevation at which it was fired, nothing is easier than to determine its comparative merits. Mr. Boucher claims to have invented or perfected the best mode of rifling, and the best form for the projectile, and appeals to his performances for the confirmation of his theories. He states that he has fired "*thousands of these bullets, and though not a first-rate shot, he has repeatedly placed* 70 *per cent. of them in a space the size of a man at* 600 *yards.*" Now I will give a silver salver of the value of twenty guineas to Mr. Boucher, if he will put seventy shots from a hundred into a target the size of a man (i.e., six

feet high by two feet wide) at 600 yards, between this day and the 15th June next. If Mr. Boucher should, I will cheerfully also pay his expenses to Hythe and back. I shall really be thankful to him, and then have much delight in listening to his theories. Let him *repeat* what he says can be "corroborated by the most unquestionable 'evidence.'" I will then buy one of his rifles, and recommend them to all my friends.

I will now detain you but a very little while. I hope I have already pointed out what those requirements are, to qualify an infantry soldier efficiently to use highly-improved modern fire-arms, and the way in which we try to communicate those qualifications; and have convinced you that they are within the attainment of the class of men from which our soldiers are mainly derived. It is admitted that infantry is the most perfect part of every army, combining in itself both offensive and defensive powers. They are numerically the strongest, and who can sufficiently estimate what may be its increased power and importance when armed with, and qualified to use, modern highly-improved arms; certainly the relative value of such men will be greater in proportion, as compared with artillery and cavalry, and indeed they will become more independent of both. I am sure we must all feel thankful to Lord Panmure, our late Secretary for War, for it is to his liberality we owe the present generous support bestowed upon the school of musketry, in common with many other boons calculated to raise the comfort, position, and efficiency of our army. I need only allude to one, *viz.*, the *increase of pay* very recently bestowed upon the non-

commissioned officers. I trust that infantry officers will strain every nerve to occupy the vantage ground set before them; and congratulate my infantry brothers on the warm interest which his Royal Highness the Duke of Cambridge takes, not only in the service at large, but (from my own knowledge I say it) in musketry in particular. I beg you will excuse my speaking so much of infantry, being an infantry soldier myself. I rejoice in reminding my brother soldiers of the zeal with which his Royal Highness carries out the system of rifle instruction, and that under his auspices, an era has been inaugurated, and a system introduced of honouring and paying soldiers in proportion to their efficiency, and which, I firmly believe, will do more to raise the British army than anything that has hitherto been attempted; for *now* the most efficient soldier in each regiment will have his decoration of honour and his three-pence per day; the best man of every company, his decoration and twopence per day; and a hundred men of every battalion, who are called marksmen, will have their distinctions and each a penny per day. On board your men-of-war, you have your A.B.'s (able seamen), who are recognized as being worth, and therefore who receive, more than another sailor; and thus, I am rejoiced to say, it will be in the army. Make it worth a man's while to learn his duty well, and you will find that he will do it. There are honours and rewards now placed in larger measure before our men. A soldier, who may not be able to read or write, can earn his good conduct badges on his right arm, with the extra pay, and also carry some other decoration on *his left* arm, with further increase of pay, showing that

he is not only the best conducted, but *one of the most efficient soldiers in his regiment.*

The present era is a most important one in our military history; let us, therefore, strive to seize this golden opportunity, and there cannot be a shadow of question, that we shall be successful in making our army, though fewest in number, the greatest in power!

LECTURE III.

Substance of a Lecture delivered to Noblemen and Gentlemen of the Rifle Volunteers, at Hythe, 1st November, 1859.

My Lords and Gentlemen,—

It is my province to address you, in furtherance of the design for which you have visited this establishment, with a view to interest and encourage you to persevere in the use of those means by which alone your object can be attained.

I must confess myself to be most deeply interested in the Rifle movement, both as a citizen of the first nation upon earth, and as an English soldier. Much speculative opinion has been expressed as to the mode in which Rifle Volunteers should be employed and fight, and as to the value of the services they may render; but these questions can only be answered conditionally, and must wholly depend upon the measure of their efficiency. The age for secrets is past, and, no doubt, the number and military value of the Rifle Volunteers of Great Britain will be *even more* correctly known upon the Continent of Europe, than at home amongst ourselves. I have in my possession a Russian *book of instructions* in musketry taken at Yenikale,

containing similar diagrams to those used at Hythe, in illustrating the lectures delivered to our soldiers. It is dated 1852, nearly two years before this school was established by the late lamented Lord Hardinge. Two years ago I was shown by one of the first London gunmakers a splendid case of English *military* rifles, consigned to a *merchant* at St. Petersburgh!

The astonishing results to be produced by the rifle, can only be hoped for when the ammunition is suitable, the weapon is good, and its powers developed by a skilful marksman. Remember, that the combined services of the ordinary drill-sergeant, the gunmaker, and the tailor, can only turn out what I call a *paper* rifleman, or a rifleman upon paper; valueless, when placed in front of an enemy in the field, as the old rags of which paper is made.

Then what is a rifleman, whose name you have assumed? I fearlessly answer that his leading qualification is to be able to fire with accuracy at *long* ranges, the extent of range being only limited by the powers of the human eye. A most striking illustration of the profit of *long* range may be read in pages 480 and 481, of the *Treatise on Naval Gunnery*, by Sir Howard Douglas.

The following is an extract:—

"In the action between the 'Macedonian' and the 'United States,' the American frigate avoided close action for a full hour after fire commenced. Captain Carden states, 'that from the enemy keeping two points off the wind, the British frigate was not enabled to *get so close to* her as was desired; and that it was not *till after an hour* cannonade, when the enemy backed

and came to the wind, that close battle commenced.' This shows that Commodore Decalin's plan of operation was to keep at long-shot distance for some time, to try the effect of relative precision of fire—to avail himself of the superiority of his long twenty-four-pounders over the eighteen-pounders of the 'Macedonian'—and, by edging away from the British frigate, which gallantly attempted to close directly from the windward, to prolong a preliminary operation so much in his own favour. How far he succeeded is shown by the opinion of the court martial, 'that the "Macedonian" was very materially damaged *before* close action commenced.' When the British frigate was completely crippled, the American came to the wind; the event is well known as a display of courage, the character of the service and of the country was nobly upheld; but it would be deceiving ourselves were we to admit that the comparative expertness of the crews in gunnery was equally satisfactory. The author's object being to press home the absolute necessity of training, to expert practice, master gunners, their crews, and captains of guns, he supports his opinion of the vast national importance of such a measure by strong, impartial, and unreserved appeals to facts. Now, taking the difference of effect, as stated by Captain Carden, we must draw this conclusion—that the comparative loss in killed and wounded (104 Englishmen to 12 Americans), together with the dreadful account he gives of the condition of his own ship, whilst he admits that the enemy's vessel was 'comparatively in good order,' must have arisen from inferiority in gunnery, as well as inferiority in force. That our frigate *should be* captured was not at all surprising, considering

the great odds against her; and the comparative ravages in the two vessels indicate the disadvantages under which this gallant officer was compelled to engage."

Here was a combination of science and skill; the American commander would not allow the English captain to close, and thus the *longest range* gained the victory. Now what is true of two ships, might be predicted of two regiments, companies, sections, or individuals. Suppose A and B to be in contest, and that A can fire with accuracy to 1000 yards, but B only to 500 yards; should A choose to keep B at more than 500 yards' distance, B would soon be disposed of. Again, suppose A to be in position or at a post which he is commanded to defend against the attacks of B; A would then have B under the command of his weapon during the time taken by B to advance 1000 yards, B being unable to make a reply to A's fire until within 500 yards of A. But could A only range 500 yards, the time for B's advance under fire would be much shortened; while, at the same time, B would be able to keep A's fire in check during the whole period of his approach.

In the olden time, field artillery could trot leisurely up in the face of a column of infantry, pull up out of the range of "Brown Bess" (about 300 yards), then commence "action to the front," and sweep the infantry with grape or canister, as snow with a besom, from off the surface of the earth; but with a long-range rifle, no field artillery ought ever to get within canister or *grape* distance. He must be a queer rifleman who *cannot topple over* horses at 800 yards! No cavalry

or field artillery can exist in the open country, under the fire of long-range riflemen in skirmishing order, within 800 yards; and as for forming square, do not waste *your* time in learning to perform it, as there should be neither dragoons nor horses left to be killed, long ere they can approach within charging distance. There are living men who say that infantry should not fire beyond 400 yards; it is the business of soldiers dressed in blue to destroy the Queen's enemies beyond 400 yards. It is stated by some writers, that battles will be gained *as before*, by the united action of masses of infantry, and the demonstrations of cavalry, and the recent campaign in Italy is quoted in confirmation of this statement; from this I must dissent, for I maintain that *long-range* rifle shooting has never yet been fully tested. In the first place, neither the Austrian nor French infantry were *universally* armed with a rifle; many of their regiments *still* possess the old smooth-bore musket. Again, had every soldier carried a rifle, I require proof that they were skilled marksmen at *long ranges*, before I can admit that the powers of the rifle have yet been fairly tested. Many of the recent actions in the North of Italy show a vastly increased number of superior officers to have been killed and wounded, compared with those who fell in the days of "Brown Bess," and this could only have been in consequence of the increased numbers of skilled riflemen employed; as marksmen always aim at a definite object, not at a regiment. I exhort my pupils, never even to put up with a colonel, when there is a general within range still remaining unshot. Our recent sad outbreak in India proves nothing; the rifle has been for so short

a time in the hands of our soldiers, that the officers were not fully acquainted with its powers, neither were the men there skilled in its use.

England is certainly one of the most favourable countries for the employment of *long-range* accurately-shooting riflemen, its generally enclosed character affording abundant cover, which, at the same time, obstructs the advance of artillery and cavalry. Let it be remembered, that it does not follow, because a man or gun can fire well at short ranges, he or it should hit at *long*, while he who can fire well at long, cannot fail to do satisfactory business at short. Allow me to read a few lines from a speech delivered by Captain Tyler, Royal Engineers, at the United Service Institution, entitled *The Rifle and the Spade*, and extracted from the journal of that institution, vol. 3, 1859:—

"In the first place, we may take it for granted—and, whatever we may desire, we must accept it as a fact—that small arms will eventually be enabled to produce destructive effects at ranges five or six times as great as those at which the musket of former times was properly used. We may confidently expect, not only that the fire of skirmishers will be more effective, but also that it will, in consequence of its increased range, and its vast powers of destruction, when employed against troops in any sort of close order, supersede to a certain extent the present grape and case-shot of field artillery, on the one hand; while, by its powers when employed against uncovered guns, it will in some measure serve to prevent their action on the other. *Concentrating* in this manner a vast amount of accurate *fire against* an enemy's field artillery, to which, with

its only partially divergent, and, under such circumstances, comparatively random fire, it will be but ill able to reply, they will produce effects upon it which it will be unable, at ranges of 600 yards or so, to withstand, and which will compel it to act, when uncovered, from greater distances. Turning their weapons against an enemy's cavalry, they will without difficulty compel it either to advance or retire, if it have been injudiciously placed within their reach. The skirmishers on either side will, in fact, become so formidable, and will, seconded by the far-ranging power of more distant field artillery, have the power of producing such deadly effects upon the masses of infantry, upon the cavalry, and upon the field-artillery of their opponents, that when hostile armies approach each other in future, they will be compelled, instead of sleeping within 1,000 or 1,500 yards of each other, as on the night which preceded the Battle of Waterloo, to maintain a more respectful distance; and, at all events, in the case of an invading army amongst a hostile population, to shelter themselves behind the best combination of natural and artificial cover that they can procure, as the only means of avoiding continual annoyance and gradual annihilation."

The following words were spoken by General Sir John Burgoyne at the termination of Captain Tyler's lecture:—"It is evident that the general introduction of the rifle into the service, and the greatly increased power that is rapidly being developed by means of rifled cannon, will require much alteration in the system of warfare, which will not be fully understood until after much studied consideration given to the

subject, and after much practice, and even experience, in actual war. I will, on this occasion, only allude to one, which is the great necessity that will arise for troops to procure cover *from the deadly aim of these perfect weapons, even at great distances.* The whole resolves itself into what is becoming more and more apparent, that the soldier's is becoming every day more a *skilled* profession, and the *well-practised* soldier of *increasing value* over the raw recruit. With regard to the effect of the introduction of these great improvements in warlike implements, we have no reason to fear the consequences."

The British soldier was pre-eminent "in old times in the use of the bow. He has since then been as superior with the bayonet, and we have no reason to fear but that he will shine equally with the *rifle.*"

Trusting you feel satisfied that to shoot with accuracy at *long*-ranges is the vital point, I shall now direct your attention as to the mode in which this skill is to be acquired. I feel that we are at a sort of crisis in our national history; I am most deeply interested in the present rifle movement, anxious for its success, and I dread lest it should turn out only a "fever," to be followed by a reaction of apathy. While my desire is therefore to encourage, still, to preserve from disappointment, the truth should be spoken; and I must, therefore, caution you, lest you should fancy that rifle shooting is an easy thing, or a matter of course. If any volunteer should imagine that continual ball practice is all that is requisite to make him eventually a good shot, he will rue his mistake, and to his surprise, find, as a general rule, that the *more* balls he fires off, the *less* he

will hit; in fact, he is firing by luck, practising and confirming his own errors. While I do not regret that untaught men cannot shoot with certainty, I affirm that the power of becoming a marksman is within the reach of any man possessing eye-sight, if he perseveres in a detailed course of training; and he who has acquired this skill, is thus far superior to his fellow-men, and has the inward satisfaction of having overcome difficulties. Ours is the first mechanical nation upon earth, and almost anything can be had in England for money but a taught soldier; and if you require him, there are none to be had for "love or money" ready made, but you must make him for yourself.

Our Royal Commander-in-chief promulgates to Her Majesty's army that "a soldier that cannot shoot is useless, and an incumbrance to the battalion;" *ergo*, what would be the military value of a *paper* volunteer? Suppose a gentleman, who had never had a fowling-piece in his hand, were to invest in a first-rate gun, dogs, licence, with appropriate tailoring, and calling himself a sportman, were to sally forth upon the 1st October to practise shooting (for there would be no difficulty about "leave to shoot" in this case, I should conceive); now, would you give a blank order to your butcher, in hopes of roast pheasant for dinner? for myself, I should be loth to speculate even in bread sauce. I much question whether my ideal sportman would ever try this game a second season. Imagine another hero, about to *practise* fox-hunting, before he had acquired the art of continuing upon the outside of a horse, and vainly endeavouring to hold on by his spurs. But to shoot game, to ride a horse, or hit at long ranges,

can each be taught. I can positively assure you, that by carrying out the system inculcated at Hythe infallible success must follow; but unless you set to work upon a systematic plan of "preliminary instruction," what we term *position drill*, and *aiming drill*, nothing but failure awaits you. For details concerning our mode of procedure, and other information connected therewith, I must refer you to the book of Instruction in Musketry, 1859, and the Annual Reports of the Inspector-General, published by authority, together with some hints which I trust may be gleaned from this and my two preceding Lectures.

It is stated in our book of Instruction, at pages 10, "The rifle is placed in the soldier's hands for the destruction of his enemy; his own safety depends upon his efficient use of it; it cannot, therefore, be too strongly inculcated, that every man who has no defect in his eyes, may be a good shot; and that no degree of perfection he may have attained in the other parts of his drill can, upon service, remedy any want of proficiency in this; in fact, all his other instructions in marching and manœuvring can do no more than place him in the best possible situation for using his weapon with effect; and it cannot be too strongly impressed on the mind of the soldier that, to shoot well at long ranges, he must train and strengthen his eye by looking at small objects at distances beyond those at which he will have to fire in practice."

The proofs that men can be taught to shoot are now so numerous that I am at a loss which to select; I shall confine myself, therefore, to two only. The papers *recently contained* accounts of rifle matches amongst

officers serving in Ireland, from which it appears that the spirit of musketry is not only rapidly pervading our ranks, but that those officers and non-commissioned officers who have been at Hythe, invariably head the list, thus showing that the taught beat the untaught. This fact has also been still further demonstrated at Hythe, where taught officers have come off victorious in firing a match against themselves when untaught. On the 15th August this year, a batch of about fifty officers arrived here to go through a course; all those who had never had any instruction in rifle shooting were requested to give in their names, when thirty presented themselves, to whom three rounds each of ball cartridge were given to fire at 600 yards at a target eight feet by six feet, when the result of their performances was eighteen hits out of ninety shots. The same officers, firing under similar conditions, at the expiration of a single course of instruction, obtained thirty hits, thus nearly doubling their efficiency, as the consequence of being taught to shoot. Our ancestors became the first archers in Europe, as the fruit of long training; and they did not, what it is desired you may be equal to, should the occasion arise, *viz.*, merely *defend* a kingdom, but they were the men who *conquered* kingdoms! If Englishmen were once the most skilful shots with a bow, will her sons in the reign of our Queen Victoria admit their degeneracy? or, will they not rather prove themselves worthy of their fathers, by becoming the first rifle shots on earth? Need I remind any of you, that archery was pursued in England as a national pastime and *duty*, for every male above seven *years of age* was compelled by law to qualify himself to

aid in the defence of the land which gave him a freeman's inheritance: and more than this was required of him, he was obliged by continual practice to keep up his shooting powers; he was both encouraged and protected in the performance of this national duty, as a law was passed in the reign of Henry II., which freed from the charge of murder any who in practising with arrows or darts should kill a person standing near. I am encouraged to hope that this patriotic flame is rekindling amongst us; that it never died out, although it flickered in the socket, is obvious in the following extract from the *Times* of a few days since, *viz.*, "Good news for Riflemen.—It is stated in the *Ladies' Own Journal*, that by the 44th George III., cap. 54, sec. 11, all members of a rifle corps are entitled to *wear hair powder free of duty ! ! !*" Alas! advancing civilization and progress render this privilege no longer a boon to the army, who are now taught at Aldershot to bake their flour; but woe to the man who should shoot even a donkey or a pig in 1859. I think I once heard of the case of an Irish horse which came in contact with a rifle bullet; the whole of the solemn consequences I am not able to detail; all I know is, that the rifle instruction of the troops was entirely suspended, until this infraction of the liberty of the subject was duly enquired into. I was once told by a *native*, that the target practice of our soldiers frightened his sheep; my reply was, that were it not for soldiers, perhaps, some day he would have no sheep to frighten.

Best rifle. I shall now address you a few words upon the subject of arms. We are repeatedly asked what is the *The* two grand requirements for a soldier's

gun, are accuracy at *long* ranges, combined with celerity of loading. Long range can be obtained by increasing the quantity of gunpowder, and weight of projectiles, as it is by weight that resistance is overcome. The range of a projectile is determined by the power it has of overcoming the resistance of the medium through which it passes, which is called its momentum, being the weight multiplied by the velocity. To acquire increased range in this mode would entail recoil, which would be fatal to accuracy, but which might be neutralized by increasing the weight of the arm. But here there is a limit, as the soldier must not be overweighted with his rifle, ammunition, etc., otherwise he would have little strength remaining at the end of a day's march to fight, if so equipped.

The range of a projectile is also influenced by the magnitude of its surface, the resistance of the air being in proportion to the magnitude of surface. Here we have a mode of extending range, *viz.*, by preserving the weight of our ball to overcome resistance, and lessening the resistance of the air by reducing the diameter of the bore. The tendency of an elongated bullet is to rotate round its shorter axis, which must be overcome by such degree of *spirality* as shall preserve the rotation of the bullet round its longer axis during the whole of its flight.

Mr. Whitworth's rifle, bore half-inch in diameter, of polygon formation, with a turn or twist in twenty inches. —The astonishing superiority of this weapon is mainly owing to the causes just stated—the bullet holds on its velocity, can therefore be fired at a lower angle of *elevation,* has greater penetrating powers at long ranges,

and its comparative merits may be summed up by stating that when fired off a rest at 1,100 yards, the mean absolute deviation was 1·2 feet! Mr. Whitworth guarantees to supply rifles whose mean absolute deviation shall be nine inches at 500 yards.

Mr. Lancaster.—This gentleman has adopted the elliptical principle of rifling, with a gaining twist, freed at the breech. In the year 1853, rifles upon this system, with barrels three feet three inches in length, bore ·577, were tested at this establishment, and found to be inferior to the long Enfield, pattern 1853. Carbines, bore ·577, are now furnished by Mr. Lancaster to the corps of Royal Engineers, and many persons are of opinion that they are superior to the Enfield. This is supposed to have been proved by practices which took place at Malta in 1856, where the figure of two companies of the Royal Engineers was found to be 42·78, which is stated to be higher, not merely than that of ordinary soldiers, but than that of candidates for the corps of Musketry Instructors at Hythe! But it must be remembered that eventually candidates are divided into two classes, the *accepted* and the *rejected*, and that out of fifty-one referred to, twenty were rejected. If two companies of Royal Engineers were to beat an equal number of accepted candidates, or actual members of the corps of Musketry Instructors, or of the staff of this establishment, there might be something to ponder over, and the circumstance would prove either that the Royal Engineers are more intelligent, or better instructed, or carry a superior arm. Against this celebrated feat of *arms at* Malta, allow me to furnish data illustrative of *the shooting of the* Royal Engineers at Hythe.

RETURN SHOWING THE COMPARATIVE MERIT OF THE SHOOTING OF DETACHMENTS ROYAL ENGINEERS AT HYTHE.

Date.	Number of detachments practising.	Figure of merit of each party of detachments.	First party on the list on each occasion.		Figure of Merit of Royal Engineers.	Place of Royal Engineers on each occasion.
			Regiment.	Fig. of Merit.		
Aug., 1856...	18	35·14	36th Regiment.....	42·54	32·50	14th Party.
July, 1857....	20	37·09	Royal Engineers.....	46·08	46·08	1st ditto.
Oct.,1858.....	27	38·16	D. Bat. Deal.....	45·68	38·07	16th ditto.
April, 1859...	18	44·35	Section of Candidates for Corps of Instructors.....	50·15	41·40	15th ditto.
July, 1859....	28	42·62	4th Bat. 60th Rifles.....	51·08	43·99	12th ditto.

From the above it would appear that the Royal Engineers on the first occasion were bottom but four, out of eighteen parties; on the second, at the head of the list of twenty detachments; on the third occasion, out of twenty-seven parties, they were eleven from the bottom; on the fourth course, out of eighteen parties, they were last but three; on the fifth, with twenty-eight parties, they were twelfth from the top.

I have great satisfaction in admitting that the military rifles of Mr. Lancaster fire remarkably well, and that there are some advantages in his mode of construction, viz., easier loading and cleaning, and perhaps durability, as these rifles would not probably deteriorate, after long-continued use, as much as those upon the shallow-grooved principle, there being no sharp edges to wear off by the friction of the ramrod, etc.; but they have never yet shown any marked advantages as regards accuracy at long ranges. The Engineer carbine requires, when using the same charge of Government powder as the Enfield, to be fired at a higher

angle of elevation than the long Enfield. I think it is correct to state that Mr. Lancaster has improved the pattern of his rifle since the manufacture of those which were first experimented upon at Hythe. The difference between the major and minor axis of his rifle *was* ·01, but *now* it is ·012, thus giving the barrel a firmer hold upon the projectile, and removing the tendency to strip, which was then so manifest. Our present ammunition is also very much more appropriate and suitable to this rifle, as the auxiliary to expansion, derived from the wooden plug, gives vastly-increased accuracy at long ranges, when compared with the Pritchet bullet.

Major-General Jacob.—We are most deeply indebted to this talented and energetic officer, who, for many years, tried a series of interesting experiments on rifles, and has the credit of reviving the idea of firing shells by infantry, which subject was first mooted by Captain Norton, whose suggestion, I trust, may yet be turned to account, and for which I hope he may receive his highly-merited reward. General Jacob recommends thirty-inch barrel, twenty-four guage, four deep grooves, and one complete turn in twenty-four inches. We hear the most marvellous accounts of the shooting of these rifles, more especially as regards the enormous extent of range. I regret that my experience with them is infinitely small. The shooting that I have witnessed with them was inferior to that of the Enfield. At page 81 of a work entitled *Rifle Clubs and Volunteer Corps*, there is a diagram of shooting *from* a Jacob's rifle, and, from its appearance, one *might at first sight* conclude that it was intended to

prove that the gun could not shoot; but upon a more minute inspection, I find a remark, that "thirty rounds were fired from a rest, six from shoulder," of which thirty-two were hits, and four misses; but whether the gun or the firer is to get the credit of the misses does not appear; in fact, nothing is proved or shown by this diagram, but that the sheet on which it is printed is so much paper wasted. The only mode of ascertaining the merits of a gun, is by firing it off a rest, and determining the mean absolute deviation, together with the angle of elevation, stating, at the same time, the allowance made for misses, which ought to be, as a general rule, half the diagonal of the target.

Rifles with a deep groove are very objectionable as military weapons, as they necessitate the use of bullets cast with raised flanges to correspond with, and exactly fit into the grooves, which cannot be made into a cartridge with the powder; hence, loss of celerity must ensue, with other disadvantages. Of shallow grooves there are a vast variety, both round and circular. The Enfield is a first-rate type of these rifles; and the long one in particular, as now made at the Government establishment, is, I truly believe, the best military rifle that has ever been produced in such large numbers, and placed in the hands of an army. Wielded by a skilled man, it is good up to 700 yards. Provided the grooves are not too deep, I believe the number and form to be comparatively unimportant, the bore being the same; for if a bullet receives a spiral motion, which continues during its flight, the object of rifling is attained, and accuracy follows as a matter of course. Facility of cleaning, easy *loading*, and the construction least likely to become

impaired by fair wear and tear, from the exigency of those rough services which the soldier may be called upon to perform, are points that must never be lost sight of.

I would here remark, that a well-made gun, although not upon the best principles, will beat an inferiorly-made one, although upon a better principle, and that it is only by reducing the diameter of the bore that increased accuracy can be obtained.

We are also asked, as to whether long or short barrels are the best. Captain Jervis, Royal Artillery, in the second edition of his work, entitled the *Rifle Musket*, at page 18, in speaking of the short rifle, states "that the shooting at long distances is not so good as with the pattern of 1853;" at long ranges, it requires a higher angle of elevation than the long rifle, which is generally understood to be the most accurate.

The barrel of a gun may be looked upon as a machine in which force is generated for the propulsion of a projectile. It is well known that the continued action of a lesser force will produce a much greater effect than a great amount of power applied suddenly. Mild gunpowder is much more suitable for rifle shooting than strong, or that which evolves the whole of its gas instantaneously; a charge of gunpowder is not all ignited at once, and time is necessary for the entire combustion of even a single grain; consequently, a long barrel fires at a lower angle than a short one, because more force can be generated before the bullet quits the muzzle. If mild instead of strong gunpowder be used in shooting from a short-barrelled rifle, some of the powder will be ejected unconsumed. All extra length of barrel, after *the last volume of gas* is evolved, can only be injurious,

by causing loss from friction. A billiard ball would travel none the straighter were it to be propelled through a hollow tube, neither would a barrel to a cross-bow aid in killing rooks. A long barrel also favours expansion into the grooves, as in a pistol barrel of ten inches, the column of air is not of sufficient magnitude to effect this purpose; hence, a muzzle-loading rifled pistol requires the bullet to be expanded upon a *tige* or stem. Breech-loading pistols are freed or chambered at the breech, and the diameter of the ball is larger than that of the bore at the muzzle, hence the bullet is compelled by the exploded gas to take the grooves. The greater the distance of the two sights, the more perfect is the aim. Thus, in these three ways, long barrels favour accuracy at long ranges. In a military arm a certain length is necessary in order to fire when two deep, and is also advantageous when used as a pike. The short rifle can be held steadier when standing, more especially during wind, by a light or a weak man; it is handy when passing through a wood, or thicket, and a very short man has more command of his gun when loading; with the sword bayonet it is heavier than the long rifle with its bayonet; while the sword is very inconvenient when running, and in firing kneeling, or lying down.

We have now in the service four rifles, each of ·557 inch in the bore, viz., the Enfield, pattern 1853; the short Enfield; the Royal Engineer's elliptical; and a short five-groove rifle for sea service, and the Royal Marine Artillery. It would seem, however, that volunteers can have but little choice, as the liberal supply of arms, and ammunition at a cheap rate, by the Government, *will* almost necessitate the universal employment

of a bore ·557 inch in diameter; and if so, the long Enfield rifle, carefully turned out, is as good as any other type.

No figure of merit or comparative test can be taken should different individuals, members, companies, or regiments, use different description of arms. Still, I am convinced none of you, gentlemen, will rest content with an inferior gun, when you can get a better; and I trust that private matches will frequently take place, to test both men and improved guns. The pleasure of shooting consists in hitting, and I have no fear but that those guns with which skilled marksmen can hit most frequently will eagerly be sought for, and become generally known. At present, gentlemen, you have the benefit of the experience of the army; but the day will soon approach, I hope, when we shall have the advantage of yours. When you get well a-head of us, and establish any *facts* connected with accurate long-range shooting, the military authorities can safely take it into their consideration, and see how far any change of arms and ammunition might be worth the vast pecuniary sacrifice which alterations in half-a-million of small arms, and consequently our ammunition, might entail. The army cannot wait, we must be armed, and the introduction of any partial improvements which would tend to introduce varieties of bore in one army, would be a matter for grave deliberation.

The breech-loading principle is also a most weighty consideration, as the powers of destruction possessed by breech-loaders would increase our efficiency three-fold, at the least. The first-rate weapon manufactured by *Mr. Westley Richards* is a perfect wonder. I saw a

small carbine, weighing about 5½ lbs., fire better at 800 yards than the long Enfield! The admission of breech-loaders into our service has been recognized by His Royal Highness the Duke of Cambridge, who has recommended that 2000 of Westley Richard's pattern be provided for our cavalry. The barrel is half-inch in the bore, which is octagonal, with a rapid twist. Thus far, so much upon Mr. Whitworth's principle. Breech-loaders have now been for some time in use in our cavalry, and the day is not far distant when, I trust, they will find an entrance (at least, amongst select men in every regiment) to our infantry, so that we may recover the celerity lost when the long-bow was abandoned; for the infantry of Edward III. could discharge twelve arrows in one minute!

It is to be hoped that the question as to what is the best *military* rifle may soon be set at rest. The propriety of changing our present arm is a wholly separate question. I am informed that a long rifle on Mr. Lancaster's principle, with half-inch bore, has been tested by the French Government, and that it is reported to fire with great accuracy at long ranges, with a very low trajectory.

A shallow-grooved small-bore long rifle has been fired at Hythe, and performed remarkably well. It was *called* an Enfield small bore; but having the diameter of bore and degree of spirality recommended by Mr. Whitworth, it is, at least, two-thirds Whitworth. The construction or form of the Whitworth bore gives it a power not possessed by any other rifle, viz., that of projecting a hardened bullet, which increases its *penetration*.

It is not pretended that perfection has yet been attained, as the superintendent of the Royal factory at Enfield admits, when stating, "Whether greater accuracy may not be attained by some alteration in the form of rifling, or shape of bullet, or structure of interior of the barrel, and without interfering with ease of loading, and all the other advantages named above, is not for me to determine. Everything, to a certain limit, is possible; and it is not to be supposed that the best arm, combining every advantage, has yet been constructed."

Bayonet.—By all means have a bayonet, and learn how to use it to the utmost advantage; but remember, that it has long been the object of infantry to attack with their projectile, and defend with their spear, sword, or bayonet. In early days, the archer carried a spear to resist cavalry, and the musketeer had, at first, a rear-rank man, armed with a spear or halbert. In process of time, the musket-rest became used as a spear; then the sword, or dagger, was stuck into the muzzle; and, lastly, the bayonet was attached thereto, so that the musketeer might fire with it when fixed. Remember, that the bayonet only took the lead as an infantry weapon because the gun could not be depended upon to hit. Both Greek and Roman armies employed slingers in advance of their columns; and each Roman soldier carried two javelins, termed pilum, which he projected by hand.

Ammunition.—Here I am apprehensive lest volunteers should labour under considerable difficulty, as accurate shooting at long ranges cannot be had with *inappropriate* ammunition. Two cases have recently come under our observation of gentlemen having pur-

chased rifle cartridges in London so wholly unsuitable that it was impossible to hit with them. The amount of windage, the nature of the lubricating mixture, the size of grain, strength, purity, and quantity of gunpowder, must be arranged with minute exactness. I am assuming that you desire your performances should be first-rate, and that you require a supply in addition to the very liberal quantity allowed by the Government. Our present ammunition is prepared with the greatest care, with an allowance of ·027 inch for windage, in order, under all circumstances upon service, to secure celerity of loading, which object it effectually accomplishes.

In a work by Captain Hawes, H.M.I.F., entitled *Rifle Ammunition*, at page 23, it is stated, "To insure the expansion of the bullet into the grooves, etc., General Hay proposed giving the hollow in the bullet, and the cup, conoidal forms; he also recommended the adoption of a wooden plug in place of the iron cup. This plug is the one at present used in the Enfield rifle bullet, and that it answers the purpose will be seen by the annexed section of a bullet, taken from amongst many others similarly affected," which had been fired into water. And at page 57, "It was thus proved beyond all doubt, the fact, that General Hay's wood plug acts as an immediate expander, even to the extent of more than ·018 of an inch." In juxtaposition with the foregoing truths it is *amusing* to read, in a tract printed by a Mr. Boucher, who propounds that, "The Minié system" (as it is commonly called) "is certainly a great mistake—a complete fallacy. It cannot be called an imposture," etc., etc. Again, "In the Minié

the cups are forced out of the bullet altogether; it is, indeed, a rare occurrence to find *one* driven fairly in. A dozen rounds or more, fired into deep water and fished out again for inspection, ought to convince the greatest sceptic of this." How rich! while Mr. Boucher can scoop them off the top of the water with his hat, Captain Hawes would have to fish for them: alas! for trial by water. I am satisfied that Captain Boxer is right, and I have no hesitation in saying that no solid, pritchet, hollow-at-base, or iron disc bullet, in an Enfield rifle bore, with ·027 windage, can receive sufficient expansion from the pressure of the gas and resistance of the column of air without the aid of some auxiliary. Captain Boxer has been able to overcome ·027 of windage by using the wooden plug as an expanding agent, yet there are officers, in the face of this fact, who modestly print, "for some reason a wooden plug has taken the place of the Minié cup, but why or wherefore I never could understand." Another writes, "assisted, *possibly*, by the wooden plug." But another writer denominates the wooden plug a "*retrograde* movement." If from missing to hitting be *retrogression*, then the Armstrong gun is a retrograde movement.

The lubricating mixture is also of vital importance as affecting shooting. The Government cartridges were dipped in a composition of five parts of grease to one of wax; but this was supposed to act injuriously upon the lead in warm climates, and it has been changed to wax only. For present use in England, grease *only* will give better results, especially in cold weather.

I would suggest that each company of volunteers *supply themselves* with plugs to test their rifles, and

guages to try their bullets, for however great may have been the improvements in the construction of rifles, the astonishing results to be obtained from them are mainly derived from using improved, *i. e.*, elongated projectiles (as we no longer fire balls); but if there be an excess of windage, it is especially disadvantageous when firing in windy weather at long ranges.

Trusting that this volunteer movement may become a national institution, I hail it as a national blessing, so far as it may aid in keeping up the manhood of the race, "and that the habit of using the rifle will bring about a taste for all athletic and skilful exercises, and counteract at once the evils of constant sedentary occupation." We look to the "next generation to emulate the skill and activity of their fathers, by continuing to enhance the custom of martial exercises." May the rifle lead our manhood more into the open air, and may the exercise of developing its powers be added to riding, hunting, boating, shooting, fencing, quoits, cricket, etc., etc., so far as these can be performed without cruelty, gambling, or dissipation. One especial recommendation of the rifle is, that shooting with it can be best pursued in the summer, when our most exciting field sports are necessarily at a stand still. Dexterity and skill once acquired, the occupation will be found a most pleasurable one, and while gaining an additional manly pleasure, you are (D.V.) improving and preserving your health, and increasing your value to your country.

An American author states:—"We generally, and always ought, to gather wisdom from defeat." Let the English *not* rest "self-satisfied with victories over the

gentle Indian and the stupid Chinaman, forgetting those tremendous lessons taught by a different race of men, at the battles of Bunker's Hill and New Orleans, where the rifle asserted its terrific superiority, when used, as it always ought to be, under cover of some description or other. It is idle to say that either British or Americans are cowards; they are of one stock and of one blood, stubborn and courageous to the death. The British have excelled in the open field, the Americans in the woods or under cover, simply because they were educated so. An army of 50,000 men landed upon the Atlantic coast, intending to remain or penetrate into the interior, would inevitably be destroyed or captured in three months, and this would be effected principally by the rifle." Why should not this statement hold equally true of 100,000 men landing on the coasts of Great Britain? I have no fear but that the skill which you are resolved to acquire will prove a most important means to such an end. I believe the best fortifications for England are *skilled men and hedges;* of course our dockyards and military depôts require more massive protection.

Lord Brougham stated at Edinburgh, that the object of the volunteer movement was to render "*invasion impossible.*" What has been, may be. England has been conquered by Romans, by Saxons, by Danes, and by Normans. A Dutch fleet ascended the Medway in the time of Charles II.; and, in the time of George III., French soldiers landed in Ireland; but, thanks to our Almighty Preserver, the soil of England has not been polluted by the foot of a foreign enemy for nearly *eight centuries!* Happily, politics or parties have no

place in our present movement; the liberality of the late government has been fully equalled by the present, and, as a military question, it is sealed with the approbation of our Royal Commander-in-Chief, who has given a liberal donation to the London Rifle Brigade, and opened the School of Musketry for the instruction of volunteers.

And now, gentlemen, I must draw to a conclusion. Let us for a second contemplate man in his two-fold nature. A perfect man is a being with a developed mind, in a developed body; neither the spiritual nor animal should be neglected or lost sight of. He is destined to live in two worlds. In this fallen planet, the mass are doomed to eat their bread "in the sweat of their brow," and whose minds in consequence are, alas! too often entirely neglected; while the minority, who *seem* absolved, and appear to evade the righteous sentence upon a sinful race, from having a larger portion of providential gifts, as grossly neglect their animal nature, but in reality they thus fall under a double curse. Let me remind you, that the decree of labour to a fallen creature "is mercy in disguise," for occupation seems to be an universal obligation and necessity. The very angels in heaven are ministering servants, and Adam before he fell was placed in the garden of Eden to dress it, and to keep it.

May we not read the page of history in vain; for it reveals to us, that as nations increase in wealth, then luxury, ease, pleasure, and enervation, follow in its train. When once we begin to delegate our more arduous duties to others, and consider our proper occupations as our troubles, and employ others to think, to

act, and to fight for us, then our doom is sealed, our glory is vanishing, our end is approaching!

It is stated that the descendants of those very Romans who conquered the civilized world, sank so low that they fled at the blast of a trumpet!

As skill is power, may I exhort you to become skilful and very courageous, knowing that the Lord your God "He it is that fighteth for you; for the race is not always to the swift, neither the battle to the strong." With the blessing of England's God, are we not bound to transmit to our children that which our fathers were enabled to preserve for us? Is England worth less than she was? Great Britain, the most highly favoured land that now is, or ever has been, upon earth. Living under a constitutional Sovereign, who governs by example; open Bibles, freedom of conscience, free words, thoughts, press, and actions; no passports; your cottage a castle, with protection of person and property to an amount unknown in any other country; dominions upon which the sun never sets; and boundless wealth. But this very fact renders us a more tempting bait. You profess yourselves the soldiers of Queen Victoria. May I remind you of your allegiance to the King of kings, for "He is our refuge and strength: He maketh wars to cease unto the ends of the earth; He breaketh the bow and cutteth the spear in sunder, and burneth the chariot in the fire." His people are encouraged to look forward to the day when "they shall beat their swords into ploughshares, and their spears into pruning hooks: nation shall not lift up sword against nation, neither shall they learn the art of war any more." In *the meantime*, let Britons be ready, "shoulder to

shoulder," for the only fountain of truth unmixed assures us, that when "a strong man is *armed*, his goods are in peace;" and it is only in this prepared state that we may hope to "sit every man under his own vine, and under his own fig-tree, no man making him afraid." Oh! that "we may be wise" (in both a spiritual and temporal sense); "that we may know the things belonging to our peace, before they are hid from our eyes." May surrounding nations exclaim, surely this "is a wise and an understanding people," diligent in the use of means for the preservation of the blessing showered down upon them; nevertheless, confessing "I will not trust in my bow, neither shall my sword save me." For they confess that "they gat not the land in possession by their own sword, neither did their own arm save them; but thy right hand, and thine arm, and the light of thy countenance, because thou hadst a favour unto them." Hating war from the bottom of my heart, I rejoice in this national movement, as a means for its prevention; and, in returning my best thanks for your patient endurance, I wish you success in your undertaking, both individually and collectively, as members of a National Peace Society!!!

THE END.

W. S. Paine, Printer and Bookseller, Post Office, Hythe.

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At a special meeting of the Committee held on the 7th inst.—Lord ELCHO, M. P. in the Chair—the following Noblemen and Gentlemen were nominated a sub committee to carry out the new arrangements;—

Sir Ralph Anstruther, Bart.	Lieutenant-Colonel G. M. Hicks.
Captain the Hon. T. C. Bruce.	Alexander Stavely Hill, Esq. D. C. L.
Major Brewster.	Lieutenant-Colonel the Hon. C. H. Lindsay.
Dr. John Rose Cormack.	Lieutenant-Colonel Viscount Ranclagh.
Lieutenant-Colonel Lord Elcho, M.P.	Captain Josiah Wilkinson.
Thomas S. Egan, Esq.	
Lieutenant-Colonel the Earl Grosvenor, M. P.	

By Order, WILLIAM DE CARTERET, Secretary.

Club-House, 53, St. James's Street, S. W.
May 16, 1860.