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NOTE AND COMMENT.

The New York riflemen are not to be allowed peaceable enjoyment of the Creedmoor range, though it is only a few years since the State Government acquired the property, for range purposes, from the private company under whose control it had hitherto been used. An unsympathetic farmer recently applied to Justice Cullen in the Supreme Court, in Brooklyn, for a writ to compel Charles F. Robbins, State Inspector of Rifle Practice, to discontinue the use of the Creedmoor Rifle Range, alleging danger because stray bullets went over the embankment in the rear of the range, He had leased the land to three different persons, but they all refused to renew their leases. In 1886 the land owners received compensation up to that date, but when the range passed into the hands of the State further compensation was refused, Judge Advocate-General Jenks holding that Creedmoor was not dangerous. The farmer's next resource was, as above stated, to apply for an injunction to restrain the party in charge of the range from using it. The result is not reported.

It has been intimated to us that in the article published a few weeks ago about the commandant-expectant of next Bisley team, we did an injustice to the officer in question by representing him as having sought the post, whilst as a matter of fact the initiative was taken by friends, without his suggestion or knowledge; and that only when he was informed that the honour could be his if he so desired, did he actively interest himself in the matter. If the case is as thus stated, the friends certainly made too free with what was not their property or perquisite, and the result is apt to be nothing but disappointment. There are several officers with good claims available for the command, and from the cordial endorsement of our protest we have received from many active members of the Association, it is plain that the command must go to an officer entitled to it through services rendered in the interest of rifle shooting. Noticing our article, the Forest and Stream, in its rifle column, says of the contemplated political appointment that nothing could be better calculated to discourage the body of riflemen in the ranks or of officers over them to better themselves in the art of accurate shooting.

In England, happily for rifle shooting, an important victory by a representative team brings a gratifying public acknowledgment such as our Canadian riflemen seldom experience. An instance in point was the recent reception,

in London, of the Elcho Shield, won at Bisley this year by the English Eight, and accordingly brought back to London after several years' absence. It will remain in the possession of the Lord Mayor until the next Bisley meeting. As in former years, the reception of the trophy by the Lord Mayor was attended by a brilliant ceremony, and though the weather was to some extent unpromising, the large hall was so crowded with spectators as to leave but little room for the Volunteer escorts who brought it to its destination. The shield was placed upon a gun carriage of the Honourable Artillery Company's Horse Battery, at the Blackfriars end of the Thames Embankment, and escorted by parties from nine of the Volunteer corps interested, to the Guildhall, where the reception ceremonies were proceeded with. The shield, an immense affair, was borne into the hall by seven of the eight winners, one being unable to attend. Of course there was a banquet, held on the evening of the reception day.

At this banquet Sir Henry Halford, Captain of the English Eight, made some very interesting remarks on the future of "any rifle" competitions—to which class that for the Elcho Shield belongs. Speaking, as he said, without having consulted his colleagues on the Council of the N. R. A., and not desiring to commit them for what he said, he thought that the time had nearly come when match rifles should only be admitted which would take the Lee-Metford cartridge case. His reasons for this suggestion were that both England and all the Continental nations had now definitely adopted a rifle with a bore of about .3, and that the comparatively large bore of the present match rifle was now out of date. That rifle had practically done its work in proving what a good man with a good rifle could do. The National Rifle Association was founded for the advancement of rifle shooting, and he thought that the mission would be best fulfilled by encouraging the best shots in the world to turn their attention to the development of the 303 rifle. He did not admit the justice of the onslaught that was being made on the A. R. competitions at Bisley, but he thought that there was a great and useful field in the development of a rifle taking the present service .303 cartridge case. Of course, the change which he suggested could not be made at once, but he thought that it might take effect in 1893.

In military, as in every walk of life, consistency and common sense are constant companions, helping each other wonderfully on the road to prosperity and success. - Compbell Copeland.

REGIMETAL. TORONTO.

THE QUEEN'S OWN.

A lecture on Battalion Drill was given to the officers and sergeants of the Queen's Own by Lieut. Col. Hamilton last Monday evening in the sergeants' mess room. The lecture was well attended and partook more of a general discussion on the many details governing the duties of officers, guides and markers. After the lecture a light supper was furnished by the mess and a very enjoyable evening was brought to a close.

The regular weekly parade of the Queen's Own on Wednesday evening, the 4th, was the largest of the season, 503 being the total number on parade. Headed by both bands, the regiment marched, via Wellington, York and King streets, to the old Upper Canada College grounds where the hardest night's drill of the season was put in, for upwards of an hour. The regiment are hard at work getting ready for inspection, and to judge by the steadiness and alacrity displayed on this parade, they will have no trouble in sustaining their already high reputation, although their comrades in arms, the Grenadiers, have been working just as hard and will give them as hard if not a harder fight than ever before.

The regimental orders for the evening contained a notice of church parade, Sunday, 8th November, to Westminster Church; also of muster roll on Wednesday evening, 11th

inst., at 8.30 p.m., in review order.

A great many of the men are disappointed in the programme of the 12th not embracing the sham fight. For the past three years both regiments have made a whole day parade out of the holiday, most of it being taken up by the sham fight and concluding with a review. This year, I believe, the regiment will be inspected in company as well as battalion drill on the conclusion of which a brigade will be formed and a review take place.

The Queen's Own I expect will march out to the appointed spot, some 5 miles from the city, and are expected to be on the ground at 11 o'clock, the Grenadiers one hour later.

The Queen's Own Amateur Athletic Association meets very shortly to map out plans for the coming winter, and the following will be among the main attractions:—Weekly tramps, possibly to some place convenient to the city; hockey, both for regimental teams in the Canadian Hockey League as well as a regimental tournament between company teams, for the championship of the regiment. I think it would be a splendid idea for all the city regiments to form hockey associations and form a league. I have no doubt it would be successful and, still further, arrange matches at curling as well. I would like to see teams from the Queen's Own try conclusions at hockey, curling, and Morris tube rifle matches with the Victoria Rifles or any of the city clubs. Ye gods, what a time there would be!

THE GRENADIERS.

The weekly parade of the Royal Grenadiers took place Thursday evening, 5th November, and headed by both bands marched to Upper Canada College Grounds, where a profitable hour was spent in battalion drill.

The regiment will parade in review order with busbies and leggings (without side arms) on Sunday next, 8th inst., in Queen's Park, at 3 p.m., and march to the East Presbyterian Church for divine service.

In reference to the Thanksgiving parade for inspection at Norway, the officers seem to think that the Government ought to furnish transportation one way at least, but as it is not done the regimental funds will stand the expense. Col. Dawson says he is not going to march his men to Norway, give them four or five hours' hard drill, and march them home again. He says that if necessary his men could march to Cobourg and back, but that he does not propose to do so on a holiday parade.

If there was any entry for the Gzowski drill competition (open to city battalions of No. 2 District) it is quite probable that the regiment would not take any part in it, but as the inspection counts for it the points will have to be counted. There is considerable feeling in the regiment against doing anything in the inspection for the competition except what the department expects from every regiment in Canada. The total strength was 487, H Company being largest on parade.

THE HIGHLAND CORPS.

The new kilted corps met for drill last night, Capt. Macdougall, I.S.C., being in command. Under drill instructors from C Company I.S. C. the men to the number of about 175 were put through squad and physical drill.

Pte. Alfred G. Robertson, formerly Col.-Sergt. in the Queen's Own, has been promoted to be Sergt. Major.

The orders for next parade will contain the names of those promoted to be colour sergeants.

Toronto people are looking forward with increasing interest to the first parade the regiment makes. It has many friends in this city, and the city corps to a man hold out the right hand of fellowship and show that there is no room for jealousy in their hearts towards an aspiring regiment of fellow citizens. There is lots of room in Toronto for another battalion, and everyone will show that the same good feeling which characterizes the Queen's Own and Grenadiers will be cordially extended to their Highland brothers in arms, and that feeling will be still deeper impressed by the fact that allegiance is sworn to the same Queen, the same flag and the same country.

Breach Block.

G COMPANY, Q. O. R., AFIELD.

G. Company, Q. O. R., Rifle Match was held on the Garrison Common Ranges last Saturday, 31st Oct. It was a raw, wet afternoon, dull light and a strong front wind, which made scoring in the standing and at 500 yards in the general rather lower than usual. The prize list was a remarkably good one for a company match. In the team shooting Col-Sergt, Sanson, Sergt, W. H. Leacock, Pte. Eastman and Pte. Blackhall wers 1st, \$5; 2nd, Capt. Mercer's team, \$3; 3rd, Corp. Routh's team, \$2 In the highest individual score on each team Col-Sergt Sanson, Capt. Mercer, Corp. Routh and Sergt. Thorn, each \$1. The contest for the challenge cup was very keen between Sanson and Thorn, both having won it once. They were each credited with the same scores in the standing at 200 and 400 yards, and at 500 yards they were a tie up to the last shot, when the latter made an outer and his opponent finished with a magpie, winning by one point.

ECHOES.

What was the matter with my shooting outfit? It must have been the rifle.—Sergt. Stewart.

I ought to have done better in the standing match, I can reach to within a few yards of the target.—Sergt. Leacock.

I am happy--- I beat the cook -- Staff Sergt. Macdonald.

I can shoot better standing than lying down.—Staff Sergt. Williams.

I almost had the cup. If !- Sergt. Thorn.

Everyone saw my shooting boots and coat.—Col.-Sergt. Sanson.

I can shoot landlords better than bulls-eyes.—Private O'Callaghan.

I will not be responsible for my shots, the mounds are not nearly large enough.—Lieut. Burnham.

If Charlie M, had been up to coach me I would have done even better than I did.—Mr. Walker.

THE DIGBY BATTERY.

The Trophy won by the Digby (N. S.) Field Battery, at the Dominion Artillery Association competition at Quebec this year, was recently presented with fitting ceremony, at the Royal Hotel, Digby.

On the centre table in the middle of the room stood the Mercier Trophy, the prize won by the Battery. Following some appropriate remarks by Major Daley on the creditable effort of the Battery, the presentation of the cash prizes to the members of the detachment took place. The prizes numbered eight and amounted in all to \$62.00 in cash, and badges presented in the following order:

1st, Gunner J. Bent—Silver Cross Guns. 2nd, Sgt J E Woodman—Enamelled Badge. 3rd, Sgt. H Burnham do.

Lieut. Bacon, who commanded the detachment, was congratulated on his good luck by many friends during the evening after the presentation was over. He led the way into the dining room of the hotel where an oyster supper had been prepared by Major and Mrs. Daley, who vied with each other in making the occasion a pleasent one for the boys. At 9.30 the visitors took their leave, feeling that it was something more than an empty name to be a "soldier laddie."

The Mercier trophy is a very handsome piece of bronze statuary representing two warriors in full battle array, with drawn swords, buckler, and standard. The statuary rests on an enamelled die which contrasts beautifully with the heavy rosewood base in which it is set. The height of the Trophy from base of pedestal is 30 inches. On the side of the bale engraved on a silver shield is the inscription: The MERCIER CHALLENGE TROPHY. For highest aggregate score with 40 pr. R. B. L. and 64 pr. R. M. L.

This prize is now at Battery Headquarters and will remain in possession of the team for at least one year.

D. A. A. OFFICERS' FIRING COMPETITION.

The following were the scores of the officers participating in the Field Artillery competition of the Dominion Artill ry Association, firing 3 common shell each: possible, 30.

			, 0	
		Score.	Dir.	Time.
1	Lieut, Knowles, 1st Bde	26	Ğ	2.57
2	Lieut. Davidson Newcastle	26	6	3.15
3	Major CoutleeWinnipeg	23		
	Major Nicoll	22		
4 5 6	Capt. MilliganDurham	21	5	2.42
6	Lieut, Gaw Shefford	21	5	2.50
7 8	Lieut, CostiganMontreal	21	5 5 5	2.59
8	LicutCol. PetersLondon	20 `	6	
9	Capt. Murchisont, 1st Bde	20	4	
10	Major LindsayQuebec	10	5	
ΙI	Capt. Merewether2, 1st Bde	19	3	
12	Lieut. McCrae2, 1st Bde	18	-1	2.38
13	Lieut, Simpson,2, 1st Bde	18	4	3.54
14	Lieut. Lawlor Newcastle	18	4	3.50
15	Major VanWagnerHamilton	17	5	2.49
16	Capt. Hendrie	17	5 5	3.55
17	Major McLeanDurham	17	3	
18	Major King	16		
19	Major Mead	15		
20	Lieut, PattersonWinnipeg	14	4	3.00
2 I	Major HallMontreal	14	4	3.44
22	LieutCol. Call Newcastle	14	4	4.03
23	Lieut. Irving	14		
24	Lieut. Eccleston	13	5	
25	LieutCol. Macdonald .1st Bde	13	3	
26	Major Davidson2, 1st Bde	11	3 5 3 5	3.00
27	Lieut. Jeffrey	11	5	4.12
28	Capt. DoidgeWinnipeg	11	4	
29	Capt. Wiley	10	5	
30	- Major Stewart Ottawa	10	4	
31	Capt. HooperMontreal	10	2	
-	•			

THE REVOLVER.

A CHAMPION.

The revolver championship of the South London Rifle Club has been won by an American with an American revolver. On Oct. 20, the last day of the season, the leaders in the revolver competition had a last struggle for the championship. Mr. Andrews arrived first and worked till he got a score of 40, and then Mr. Walter Winans arrived (it is curious that these two gentlemen, though competing against each other, have never yet met). He had only 36 to make to win the championship, as he had such a big lead. He made it at the first attempt. Then he started after Mr. Andrews's score for the top place in the day "spoon" competition. He made three 40s, and then a 41, which latter won first prize for the spoon. He was greatly handicapped by his favourite old revolver, out of which he has shot many thousand shots, working loose in the action, which made it have drop shots every little while, and he had no other with him to take its place. The championship goes to the competitor who makes the largest aggregate in five scores shot on different days during the club's shooting season with military revolver and ammunition; Walter Winans (Smith & Wesson), winner of championship of the club and gold jewel representing the same -Score, 41, 41, 41, 41, 41--205 out of a possible 210. Mr. Andrews (Colt) second, 41, 40, 40, 40, 39 -200. Mr. C. F. Lowe (Colt) third, 40, 39, 39, 39, 38—196.

THE Q. O. R. ASSOCIATION.

The Q. O. R. of Canada Revolver Association intend holding their annual match some time during the week. It is likely to be held in the armoury, and in that case it may be fired some evening by electric light if thought advisable by the committee. The ranges will likely be 25, 35 and 50 yards, prizes at each distance and an aggregate. Some of the matches, probably all, will be open to the active militia of Canada and ex-members of the Q. O. R. A meeting is to be called early this week to decide on conditions, programme, etc.

The only ration a Russian soldier receives is an 8 pound loaf of black rye bread every third day, the baking of which is done regimentally. His further messing is provided for by an allowance from Government, the expenditure or which is controlled by a committee of officers. In a camp described by a correspondent of the Army and Navy Gazetie, it was 5 kopecks (2½ cents) a day per man, and it was sufficient to supply him with half-a-pound of meat, meal for porridge suet for gruel, and vegetables. This may seem rather incredible, but the contract price of meat is at psesent 8 kopecks (4 cents) a pound, and other provisions are cheap in proportion. No fixed breakfast is provided; the soldier makes the best of his rye bread, brews his own tea, or buys a cup in the canteen. At 11 a dinner is supplied consisting of "stchi"-vegetable and meat soup-and porridge. The former is excellent. At 7 each man is served out with gruel. A drink called "kvas," a non-intoxicant brewed from corn, is supplied ad *aibitum* at both these meals. Government provides the soldier with a canteen, knife, and spoon. Nature provides him with a fork. The meals are served up in a roomy shed with tables and forms, adjacent to the cook-houses. As every Russian citizen is liable to service with the colors for five years, pay is looked upon as a matter of secondary consideration. The yearly pay of a private is 2 roubles 70 kopecks (\$1.50), paid to him in two monthly instalments, each transaction being entered in the soldier's small-book. The work in camp consists chiefly of musketry; when not thus employed, three hours' drill in the morning and two in the evening are an ordinary day's work. Manceuvres lasting a couple of months take place every second year."

C. O.S I HAVE MET.

(By an Old Hand. From the Broad Arrow,) (Continued from our last issue.)

III. -THE NEW SORT.

The fin de siècle C. O. is a different man from either of the C O.s I have already attempted to portray. He has entered the Army not only because he loves soldiering for soldiering's sake, but because he intends making a profession of the Army, and that those under him shall do the same.

He began as a cadet at Sandhurst, where he got the name of "Sap"—a term applied to those who are continually sapping at their work. He did well while at the college, passed out high and got his commision without purchase for it was still in the good old days of purchase that he was at the R. M. C.—he won many prizes, and was altogether a credit to himself as well as to the college; every one was proud of him, for though a hard worker he was popular and by no means a "prig." Professors and cadets were loud in their congratulations to him when, on the "Duke's day," he was specially called out and complimented by the Commander-in-Chief.

When he joined his regiment he soon made his mark as a good officer and a nice fellow. His colonel "spotted" him as a rising soldier, and as soon as he gets a chance he makes him his adjutant; but our youngster's ambition soars higher than this, and he makes up his mind that the Staff College is the place for him; so he sets to work, passes in and out with credit, and soon sets staff employment. During this time he takes every opportunity of improving, or rather increasing, his military knowledge; he attends, as often as he can, the manœuvres of foreign armies; besides learning all he can about them, as he knows this special knowledge will be certain to come in useful.

In due course the time comes for him to rejoin his regiment as C. O. Although he has been away from regimental duty for some time, still his ambition has naturally been to command his old corps; he has not forgotten his work, and very soon shows this by his thorough knowledge of his duties as C. O. Not only has he the "drill" book, as far as actual drill is concerned, at his fingers' tips, but he is familiar with the whole of it. He has, too, studied the science of war "up to date." He knows how changed the art of war is now, even to what it was in his Sandhurst days. In short he realises that the world, including the military world, moves on, and therefore like a wise man he moves on with it, and he sets to work to put into practice what he has learnt on every available occasion, for he is determined that not only his officers but his non-commissioned officers as well shall learn something of the higher art of war, something beyond mere drill. His parades are not merely battalion drill in barrack square, he takes his regiment out into the country whenever he can, and does some good practical work; he does it in such a thorough and honest way that no one grumbles, every one sees how much in earnest their C. O. is that they help him in every way, and very soon see the benefit of his training when they come to take part in manceuvres on a large scale. Our C. O. makes his officers understand that nowadays soldiering is not the easygoing life it used to be, and that good hard honest work must be done by all ranks, and not only by the adjutant and sergeantmajor.

Not a few will think that serving in a regiment with such a C. O. must be anything but pleasant, and for an idle man or for a man who only wants to spend a few years in the army and to "see life" and to amuse himself, it certainly might not be pleasant, but "tempora mutantur," etc., for such men no regiment can be what it was; those good old days have gone never to return, it must be now a case of "quand on n'a pas ce qu'on ame il faut aimer ce qu'on a." But though our C. O. works his regiment hard, and works himself hard too, yet he knows how to make things pleasant, how to make all ranks take an interest in their work, for

while he has plenty of the "fortiter in re" he does not lack "suaviter in modo." His regiment having seen how well they got through their work in peace manceuvres, have entire confidence in their C. O. when they are about to see real fighting. They trust him, and know that he will be no more at a loss in the thick of a fight than he was in a sham battle, and feeling this it is no wonder that the regiment distinguishes itself

This C. O. is one, of course, to be admired and trusted, and if, with his professional knowledge, he combines those qualities which I attempted to portray in the C. O. of the "right sort," then indeed may our "new sort" be described as "the perfect C. O." But perfection, alas! is no more common in the days of Wolseley than it was in the days of Wellington.

THE FRENCH INFANTRY ATTACK.

The following account of the method of extending for the attack now used by the French Infantry appeared in the excellent account of the manceuvres in Champagne, which have recently been published in the *Times*:

As soon as the fire of the enemy or the vicinity of his position renders it necessary, the battalions deploy into line of company columns at such intervals as are necessary to cover the front; they march by the centre of battalions, and the direction is preserved by the battalion camp-colour, carried by a sous-officier, 50 paces behind whom marches an officer. The battalions of the second line, perhaps 1,000 paces in rear, generally adopt the same formation, and I may say at once that every unit usually did the same when it came within range of the hostile guns. Gradually, as the captains think fit, the companies in first line split up, the two leading sections moving forward, the others following either in rear or on the flanks. As ground is gained, the sections of the firing line deploy into a group of sections, the leaders a few paces to the front; after a short time, as the enemy's fire becomes felt—between 1,500 and 1,200 yards—there may be a further deployment into half-sections; after 1,200 yards the half-sections break up into squads of seven or eight files; and, finally, at about 900 yards from the position, the squads extend in a chain of skirmishers; at about 750 yards, if advance without replying to the enemy's musketry is impossible, the marksmen open fire: but the movement is pressed on rapidly, from cover to cover, the supports following at about 300 paces in rear, halting whenever the men in front are in motion. The men in the firing line, whilst advancing, close in upon the centre, so as to leave intervals into which the supports may be pushed. Eventually, the supports, which have been approaching closer and closer, in such formations as their immediate commanders consider best adapted to the ground, join the chain; and, if necessary, the reserve companies are thrown At 300 yards from the position bayonets are fixed, the fire increases in rapidity, another advance is made, magazines are rapidly emptied, the whole of the remaining reserves are brought up, sometimes in column of companies, opposite the point of attack; the drums and trumpets sound the charge, the line advances, gradually quickening its pace, the double breaks into the charge, and with cries of "A la baionnette," the whole mass rushes on the enemy.

One of the greatest difficulties experienced in all Continental armies where compulsory service is in force is that of providing good non-commissioned officers, and special in ducements have therefore to be held out to induce reengagements. The paucity of experienced non-commissioned officers is, however, now being rapidly overcome in the French Army, in consequence of the favourable terms recently offered to those who re-engage. From returns just published it appears that 24,003 re-engaged non-commissioned officers were serving in the French Army on anuary 1 last.

SIEGES BY THE ELECTRIC LIGHT.

(Electricity.)

We may take it for granted that every first class fortress will soon be provided with powerful search lights. In England, preparations are being made on a large scale for the introduction of the most brilliant search lights for the southern defences, both sea and land, to be at the disposal of the artillery stationed in the forts. We may therefore take for granted that a besieging army will find any permanent fortress against which it may be engaged, in possession of electric lights to aid in keeping a watch on the night operations conducted against it. The siege of a fortified place would, therefore, no longer be the comparatively simple operation of constructing works at night and firing from them during the day. The construction of the ordinary siege works in the manner hitherto adopted would not be possible, except at an enormous sacrifice of life. But this disadvantage on the part of the attackers can be greatly offset by the employment on their part of electric search lights; for not only has it been shown that when the atmosphere is at all laden with smoke or mist, the range of the light is seriously curtailed, but it has also been proved that the penetrating power of the light can be diminished to a large extent by the employment by the other side of another beam crossing the first at an angle. It seems that the illuminated space at the intersection of the two beams presents a screen, more or less opaque according to the amount of smoke or mist with which the atmosphere is charged.

An electric beam can therefore be used as a screen, behind which operations can be conducted in secret. The applicability of this use of the light in the attack of a fortress is obvious. In order to produce this screening effect, it is only necessary that a powerful search light should be placed in front of the flank of the ground to be hidden, so that its beam may be projected in front of it. It is better to throw the beam diagonally across the front rather than to make it traverse straight across, because its obscuring power is much greater when so disposed, and also because it contributes to disconcert the enemy's fire by the dazzling effect upon those working the guns. The projector used should be capable of throwing a very condensed beam, and care should be taken to avoid any stray rays illuminating the ground which is intended to be hidden. The light can also be used with great effect to lay the guns afterwards placed in these siege works. The firing can then be carried on at night with as great accuracy as during the day. The apparatus for use in sieges must be the most powerful obtainable. For attacking a position other than a fortress, or for reconnoitring, the employment of search lights would be hazardous.

It has been conclusively shown that the light can be placed so as not only to reveal nothing of the position and movements, but that it affords additional security by the depth of the obscurity which it casts over objects in its immediate vicinity, which are out of the reach of the beam. The apparatus is extremely difficult to hit. This is not only on account of difficulty in estimating the range, even with tolerable accuracy, but also because, without special appliances, it is almost impossible to aim at the light. As an instance of the deceptive effects of distance, it may be remarked that if the beam be directed on the ground so as to illuminate a patch of ground between the defenders and the enemy, but sufficiently far from the latter, it appears to any one looking at the projector from a distance as if the lights were situated immediately over the patch of illuminated ground; and if the projector be elevated or depressed slightly, so as to cause the illuminated patch to advance or recede, it seems as if the projector itself were advancing or receding. Owing to this illusion it is almost an impossibility, without cross-bearings, to determine the range of the light, if it be kept constantly on the move, as it would have to be

when searching for an enemy in front; and even if kept steadily fixed, the difficulty in estimating the range is very great. Besides, bullets can frequently pass through the mirror without doing any damage to the light.

With regard to the difficulty of aiming, it is of course impossible to look at the direct light on account of its blinding effect, and therefore it is impossible to aim at it in the ordinary way. In the English experiments the guns were aimed by the shadows of the sights on a piece of white paper held behind the backsight. The light from the projector was thrown upon a plane mirror mounted on a pole. The mirror could be traversed or elevated from a safe position behind a parapet where the projector was placed. The mirror was a thin sheet of silvered copper stretched on a frame, and though pierced occasionally by bullets the reflected light from it was as strong as ever. It will be very seldom that an extemporised shelter cannot be made

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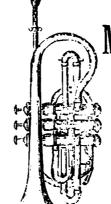
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for the projector. The light is thus worked under cover, all that is exposed being the thin stretched metal mirror mounted on a pole, duplicates of which could be easily and cheaply provided in case of accidents, and could be quickly substituted for the broken one.

Many experiments have been tried in England with search lights of various degrees of portability with a view to developing an apparatus for field operations, but the portable generating plant was considered to be too heavy and noisy. Gen. Sir Evelyn Wood said that he found the electric light of inestimable value in Egypt, and that he never went to sleep at night without throwing the light in the direction of the enemy to see if he were moving. For the defence of a port, recent manceuvres have demonstrated that the simplest and most effective adjunct is the search light in sufficient number to illumninate the entire approach.

The projectors carried by a man-of-war should be placed as near the water line as possible, in order that the diverging beam of light shall be far-reaching; care should be taken at the same time that the position be not so low as to make the lights useless in a seaway. Their position should also be influenced by that of the guns. They must be placed with due regard to the concussion on firing the heavy guns; also, they must not interfere with the firing of the secondary batteries. Just at the critical time when a torpedo boat is discovered by the search light, then are the rapid fire and machine guns wanted to repel torpedo boats, so that it would not do to allow the proximity of the beam to blind a man sighting one of the guns.

As an instance of the difficulty in picking up dark objects with the search light compared to objects of light colour, it was considered necessary in some of the torpedo launches where the crew were exposed, to have everything about the launch painted black, even to the men's faces.

Besides torpedo defence, there are numerous other applications of the electric search light on board ship. At the bombardment of Alexandria by the British squadron, the search lights of the latter not only illuminated the harbour, but they also served to keep the British constantly informed of the nightly progress of the Egyptians while creeting their When engaging at night the search light is of value in directing the fire of the battery. It is also useful in chasing and in keeping fleets or convoys together, and in reconnoiting a coast. It is useful in preventing collisions, in entering harbours, passing through narrow channels or going alongside a wharf. Even when coaling ship or taking in stores, it enables the work to be done as rapidly at night as by day. It is also useful for signalling, as instanced in the first part of this article. Many other useful applica-cations follow as emergencies arise. Some time ago one of the ships of the British flying squadron shifted her foretopmast at night by the electric light of another of the squadron which lay near her; and it is but a few months ago that the search lights of the British squadron anchored in Gibraltar Bay were the means of saving hundreds of people from a sinking merchant steamer, who otherwise would have drowned.

During the recent military manceuvres in England smokeless powders were used for the first time by English troops. The powder used was that known as Cordite, the invention of Hiram Maxim, the well known American inventor. It is reported that the new powder has not proved a success, at least in the new small-bore magazine rifle. It is said that nearly one hundred rounds had been fired with success, when, upon a slight increase being made in the length of the Cordite pellet, the rifle burst into a thousand pieces. The new powder is said to be lacking in keeping qualities when exposed to higher temperatures than 100' Fah.; when exposed to temperatures higher than that it becomes dangerous to use.

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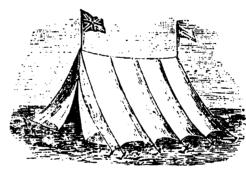
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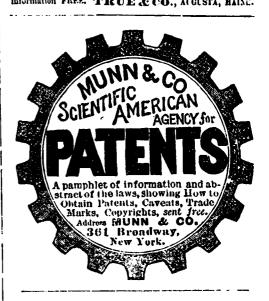
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